Birth and Breastfeeding Events:
The Influence of Birth on Breastfeeding Duration –
An Exploratory Research Study.

A thesis presented in partial fulfilment of the requirements for the degree of

Master of Philosophy

in

Midwifery

Massey University, Turitea, Palmerston North,

New Zealand.

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2004

Errata: a conversion error has occurred on page 54 and in Chapter 5, pages 72 – 107.
Please read $?^2$ as χ^2

ABSTRACT

A retrospective exploratory methodology was used to examine the influence perinatal events had on breastfeeding duration measured at four months postpartum. A self-reporting questionnaire and examination of obstetric records provided the quantitative data for 68 normal vaginal birth women and 85 Caesarean section women.

Nonparametric Pearson's Chi-square goodness of fit test was used to measure statistical significance. Almost 88 % (87.6%) of the respondents were breastfeeding four months following birth. This was 86.8% of normal birth women and 88.2% of Caesarean section women. Sixty-four percent of infants were exclusively breastfeeding and 11% fully breastfeeding four months after birth. Prior breastfeeding was the only event or experience found to be significantly statistically associated with type of birth and breastfeeding duration. A marginally significant statistical relationship was found between type of Caesarean section and breastfeeding at four months postpartum. Highly significant statistical relationships were identified between type of birth and: time of first cuddle, concomitant skin-to-skin contact, time of first breastfeed, supplementary feeding in hospital, and receiving help in hospital. A significant statistical relationship was identified between type of birth and having a breastfeeding problem in hospital, and a marginally significant statistical relationship between type of birth and 'rooming in'.

Other events that were expected and identified as highly significant statistically were: multiparity and having breastfed before, having a breastfeeding problem in hospital and receiving help, type of birth and time in hospital, and breastfeeding at four months postpartum and satisfaction. There was a marginally significant statistical relationship

between breastfeeding at four months postpartum and type of caesarean section. This studies finding that there was no difference in breastfeeding rates at four months for either sub-sample of women warrants further exploration.

ACKNOWLEDGEMENTS

My sincere thanks go to the busy women who took the time needed to fill in my questionnaire. Your answers have been invaluable in helping me understand your experiences during birth and breastfeeding and provided insight into the impact that experience has on breastfeeding duration.

I wish to thank Kathy Manhire who helped in the development of the breastfeeding study, and was the primary scholar in developing the questionnaire and undertaking the extensive literature review that was done for the questionnaire development and the study. I also thank her for her encouragement, suggestions and scholarly support.

For giving clear guidance and help in meeting Treaty of Waitangi requirements for this study, I am sincerely grateful to Di Wepa and Jean Te Huia.

I also thank my supervisor, Associate Professor Cheryl Benn, for her understanding and interest in the area under study, her patience, support and wise guidance. Her help and support in crafting the undertaking and her feedback during the writing of the report are appreciated. I also thank Evan Jones and Art Thomas for their patient and professional guidance for the statistical analysis and support.

I specifically thank the Hawke's Bay Ethics committee who unstintingly gave time and helpful advice regarding the ethical issues involved in undertaking this study. I also wish to acknowledge and thank Helen Christie, (Manager of Maternity Services, Hawke's Bay District Health Board), for having the wisdom to see a way through the complex ethical issue of not harming any woman who had a change in personal or

family circumstances over the study time period, and the sensitivity to give me support during a research crisis. Without her wisdom and support this study would not have been completed.

I am grateful to Massey University Graduate Research Fund and the Eastern Institute of Technology Research Committee for their generous grants toward printing and postage and also the Faculty of Health and Sports Science for their significant support in providing me with a research scholarship. Maria McCarthy gave me invaluable and meticulous support during the patient clinical record review process and data entry stage.

I am also indebted to many other individuals at Hawke's Bay District Health Board Maternity Services who, unstintingly, gave their time and resources, in particular Mary Orchiston and Oianah Ellison, as well as all the other staff members who provided support during the patient clinical record review process.

I also give thanks to those colleagues for their generous advice, editorial support, encouragement and for gently easing my workload. In addition I thank the midwives, lactation consultants and others who helped in the development of the questionnaire.

Finally I wish to thank my husband who gave wise counselling and editorial support as well as taking over many of the household tasks during the time of the study, and Andrew, my son, who gave scholarly support in managing the reporting of the data.

This study was conceived and conducted to shed a small amount of light on women's birth and breastfeeding experiences, and has been completed in the hope that that is what has been achieved.

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CHAPTER ONE: ORIENTATION TO THE STUDY

1.1 Introduction

The type of birth a woman has, and the events and experiences that surround that birth, have a long-term impact on mothering (Laufer, 1990). An unexpected birth outcome such as a caesarean section can cause physical and emotional suffering (Churchill, 1997), and have undesirable consequences for both mothering and breastfeeding. Lesley Page in an introduction to Clement's (1998) book sagely says:

> The quality of care of a mother, her baby and family around the time of birth will affect the health and happiness of the individuals and family concerned for many years to come. The time around birth is a critical and sensitive time, which may affect not only the physical health, but also the spiritual and emotional health in a profound way. ...Negative care will cast a long shadow forwards into the life of the individual and the family. Sensitive and supportive care will cast a light, enhancing the ability of parents to cherish and to confidently care for their baby into adulthood (p. xi).

This study, which was undertaken between January 2002 and March 2004, explores birth and breastfeeding events for any possible influence on breastfeeding duration for women who have had a normal birth compared with those who have had a caesarean section. The events and experiences that occurred and the frequency with which they happened are identified.

In this chapter the justification for the study is presented including an overview of the literature review. The study context is described. Finally the research question and the study aims and the study design are introduced. An overview of the following chapters is included, and lastly the operational definitions are presented.

1.2 Justification for the Study

1.2.1 New Zealand Society and the Maternity Services

In the latter years of the 20th century in New Zealand, there have been significant changes in the social context surrounding maternity care and maternity service delivery (Vogel, Hutchison & Mitchell, 1999). These changes include shorter hospital stays and autonomous midwifery care. New Zealand primary maternity care is managed and delivered by a Lead Maternity Carer (LMC), who was a midwife in more than 70% of the hospital births (Ministry of Health, 2003) and at least 2.8% of the home births in 2001 (Ministry of Health, 2003). The supervision of care for women requiring a caesarean section is by an obstetrician who is hospital employed, in the majority of situations. A LMC midwife may remain involved in the woman's caesarean section care to varying degrees depending on; the woman's wishes, the policies of the obstetric service, the geographical location of the secondary service and the midwife's personal circumstances and philosophy.

1.2.2 New Zealand Caesarean Section Rates

There is a western trend of increasing interventions, which has matched technological advances (Kroeger, 2004) with a high and increasing caesarean section rate being just one of these (Buist, Brown & McNamara, 1999; Bulger, Howden-Chapman, & Stone, 1998; Douche, 2001). New Zealand has followed the trend with an overall caesarean section rate in New Zealand of 22.1% in 2001 (Ministry of Health, 2003) compared with 20.5% in 2000. By comparison the caesarean section rate in Hawke's Bay was 17.8% in 2001 and 17.5% in 2000 (Ministry of Health, 2003).

1.2.3 New Zealand Breastfeeding Rates

Changes have also occurred in the maternity services arena and approaches to breastfeeding management with the Ministry of Health in New Zealand, encouraging maternity services to implement the Baby Friendly Hospital Initiative (BFHI) promoted by the WHO/UNICEF (World Health Organisation, 1998). This government driven initiative was recognised as important by New Zealand's maternity services including the Hawke's Bay District Health Board (HBDHB) Maternity Services: the regional hospital in the area where the study was undertaken.

New Zealand has a comparatively high rate of breastfeeding initiation, with around 93% of mothers breastfeeding at discharge from hospital (Essex, Smale & Geddis, 1995), however many of these mothers may continue for only a short time and fail to achieve their intended breastfeeding duration (The National Council of Women of New Zealand, 2002; Vogel et al., 1999). The Ministry of Health (2002) in the document *Breastfeeding: a guide to action*, reported that 21% of women were fully breastfeeding at 4-6 months and 61% of women had achieved "any" breastfeeding in the same time period. While these figures give us some guidance to the possible breastfeeding rates in New Zealand it is difficult to know exactly what is happening because of the differences in study designs and variations in the definitions of breastfeeding status.

The Ministry of Health (1997) in New Zealand, recognising the health benefits of breastfeeding, set breastfeeding targets for New Zealand women. There is evidence that these were not met and were reviewed in 2000 (Ministry of Health, 2002). These reset targets include increasing the breastfeeding (exclusive and full) rate at three months to 57% by 2005 and also to increase the breastfeeding (exclusive and full) rate at six

months to 21% by 2005: New Zealand, however, did not have comprehensive breastfeeding statistics at the time of the study as the country did not have the capacity to gather all breastfeeding data after the first week of life. This occurred because of the wide and varied range of well-child health providers caring for the family and new baby following discharge from LMC services. Home birth breastfeeding rates were also unable to be included in the national breastfeeding statistics because of administration problems. New Zealand has remedied this gap in breastfeeding data collection and since May 2004 breastfeeding data has been collected concerning breastfeeding status at two weeks of life and again at discharge from LMC services.

A wide range of factors influences breastfeeding initiation and continuance. These factors include: maternal attitudes (Essex et al., 1995; Ford, Wild, Mitchell & Tuohy, 1995; Kroeger, 2004; Papinczak & Turner, 2000; Pérez-Escamilla, Segura-Millán, Pollitt & Dewey, 1993), with motivation being influenced by early personal experiences, education and access to information, societal, cultural and family experiences as well as family and social support (Graffy, 1992). Other influences are: demographic factors and socio-economic factors (Papinczak & Turner, 2000; Scott & Binns, 1999), health care practices (Churchill, 1997; Pérez-Escamilla et al., 1993; Samuels, Margen, & Schoen, 1985) and social change, which have lead increasingly to mothers returning to the workforce following birth (The National Health Committee, 1999). Birth events and experiences sit on a continuum of factors, which could influence breastfeeding duration and as such fall into the scope of healthcare practices. Healthcare practices can be critiqued and modified to meet best practice objectives. A brief overview of the literature reviewed for the study follows.

1.2.4 The Literature Review

The decision to examine the women's experience of birthing and breastfeeding events was taken in an attempt to answer the following question. Does the type of birth affect breastfeeding duration?

The literature review detailed in Chapter Two, revealed that there are many studies that conclude that factors during the perinatal period can impact on the duration of breastfeeding (Clements et al., 1997; Datta, 1990; DiMatteo et al., 1996; Gorrín-Peralta & Parrilla-Rodríguez, 2000; Janke, 1988; Kearney, Cronenwett & Reinhardt, 1990; Pérez-Escamilla, Maulén–Radovan & Dewey, 1996; Procianoy, Fernandes-Filho, Lazaro, & Sartori, 1984; Righard & Alade, 1990; Scott & Binns 1999; Vogel & Mitchell, 1998, Vogel et al., 1999; Walker, 1997; Weiderpass, Barros, Victora, Tomasi & Halpern, 1998). Some variables, such as demographics, are essentially not modifiable but birth interventions and healthcare practices are.

Caesarean section is a frequent birth intervention (Buist, 1999; Kroeger, 2004) and evidence suggests that caesarean section is not without negative sequel for the mother (Churchill, 1997). Research-based literature suggests that the predominant negative effect a caesarean section has on breastfeeding is breastfeeding initiation (Churchill, 1997; DiMatteo et al., 1996; Gorrín-Peralta & Parrilla-Rodríguez, 2000; Mathur et al., 1993). The literature is inconclusive concerning the effect caesarean section has on breastfeeding duration. There is research-based evidence that once breastfeeding is commenced duration is not affected by events related to having a caesarean section (Janke, 1988; Kearney et al., 1990). It was not the intention of the current study to critique birth interventions.

While there is a wealth of written research knowledge concerning the relationship birth, particularly caesarean section, has with breastfeeding and breastfeeding duration, the literature review revealed a dearth of research literature on the impact perinatal birth events and experience might have on breastfeeding duration in the New Zealand context. If a significant relationship between birth events and experiences and breastfeeding duration could be identified then care models for clinical midwifery practice could be developed or adjusted to more effectively meet women's care needs. It is therefore important to endeavour to establish what effect, if any, perinatal events and experiences have on breastfeeding duration in New Zealand.

1.3 Study Context

The study was conducted in the HBDHB Regional Hospital area. All the respondents had a LMC for their primary maternity care, as is current New Zealand maternity care practice. New Zealand regulations, which govern the provision of maternity service, allow for a LMC to be a midwife, a general practitioner, or an obstetrician. In the current study the term LMC is a synonymous term unless otherwise stated. The LMC of the respondents having a planned caesarean section could continue to be involved during the surgery, as were some LMCs of those women having an unplanned caesarean section. All caesarean sections in the HBDHB Maternity Services are the responsibility of a hospital-employed obstetrician. When a respondent had her care transferred to the secondary care maternity services for the purposes of caesarean section, that care was returned to the woman's LMC as soon as practicable in the postpartum period.

The HBDHB maternity service has a policy of a two-day postnatal stay for women having a normal birth and a five-day stay following a caesarean section. Women who

experience adverse clinical events are able to stay longer as an inpatient. All women post delivery have a single room and all mothers are encouraged to 'room in' although a nursery is available if mothers elect to have some time apart from their baby.

Registered nurses are an integral part of the postnatal workforce. The terms midwife and nurse/registered nurse are interchangeable when referring to postpartum events following the birth. During the time of participant recruitment of just over three years, there was a steady shift in philosophy by the HBDHB midwifery team towards keeping the mother and baby together, where possible, immediately following caesarean section. This change was not initially supported by a formal organization policy so was occurring on a haphazard basis in reality (C. Brogan, October 14, 2002, personal communication).

1.3.1 Researcher Interest

As a midwife I have an enduring professional interest in breastfeeding theory and clinical management. During the course of my midwifery practice, I have observed women struggling to manage breastfeeding following birth but particularly following caesarean section. This observation led me to wonder if caesarean section birth had a detrimental impact on breastfeeding duration.

The planning and initial development of the study was undertaken as part of a Masters of Midwifery degree for both Kathy Manhire and me. Kathy also has a parallel enduring interest in breastfeeding. Kathy's involvement in the research process was; as part of the development of collaborative literature review, the development of the research questionnaire known as the Birth and Breastfeeding Experience Questionnaire

(BBEQ) and the attainment of ethics approval for the study to proceed and finally as part of the ongoing study of the qualitative data.

I was the primary researcher responsible for gaining the ethics approval and have been responsible for conducting the study and developing and writing the final thesis. Both of our names appear on the study documentation, as was required by the Ethics Committees.

1.4 Research Question and Aims of the Study

The research question was: does having a caesarean section detrimentally affect the duration of breastfeeding when compared with normal birth, and if so, can any events or experiences be identified, which might be significant?

Two hypotheses were developed for the study:

H_1: A normal vaginal birth is associated with a longer duration of breastfeeding.

H_2: A caesarean section is associated with a shorter duration of breastfeeding.

The study aimed to answer the following questions:

- How many of the respondents were breastfeeding four months postpartum after the birth of their baby?

- Do women having a caesarean section have a different duration of breastfeeding compared to women having a normal vaginal birth?

- What was the relationship, if any, of the birth and breastfeeding events to breastfeeding duration, for women who had a caesarean section compared to women who had a normal vaginal birth?

- How effective was the BBEQ as a data collection instrument?

- How effective was the clinical data collection tool as a data collection instrument?

1.5 Addressing the Research Question: The Research Design

Chapter Three discusses the study's methodology in detail, and a brief overview of how this study addressed the research question follows. To answer the research question women were asked to describe their birth and breastfeeding experiences using a structured questionnaire. The participants were recruited from the HBDHB Maternity Services inpatient database. Some clinical events were clarified, and other clinical data was established, by examining the respondents' maternity clinical records. Descriptive statistical measures such as frequencies and nonparametric statistical tests were used to describe the findings. The variables were cross-tabulated against breastfeeding at four months postpartum and type of birth to ascertain significant relationships.

A previously tested questionnaire suitable for the study was not located during the literature search, so an original questionnaire was developed for the study. The testing of the study questionnaire as a research tool was the fourth aim of the study (see Chapter Three).

An original clinical data collection tool was also developed for the research. The trialling of this tool became the last aim of the study (see Chapter Three).

1.6 Structure of the Thesis

Chapter Two provides a critical overview of the literature in order to place the study in the context of the current written knowledge. The rationale for a quantitative retrospective approach to the study and for the overall research design is presented and discussed in Chapter Three, as is the decision to use a questionnaire and clinical data collection tool, along with the processes used to develop those tools.

Chapter Four presents the results of the sample selection process, the final sample numbers and the demographic details of the sample including the characteristics of the babies. The results of the study in relation to the hypotheses and objectives are presented in Chapter Five.

Chapter Six discusses the results of the study in the context of the current available written knowledge regarding the impact that birth and breastfeeding events and experience might have on breastfeeding duration.

Chapter Seven presents the conclusions of the study and the study limitations, recommendations for future research, education and practice. Concluding remarks complete the chapter.

1.7 Operational Definitions

In this study **breastfeeding** included babies who received any breast milk. The breastfeeding definitions used in this study are from the *Breastfeeding definitions for monitoring the national health outcomes targets in New Zealand* (Coubrough, 1999).

Status of breastfeeding is the amount of breast milk an infant is receiving alone or in combination with other infant foods at any one time and includes the following types of feeding. The respondents determined their breastfeeding status using fixed response categories.

Exclusive breastfeeding is an infant who has received breast milk and medicines only from birth.

Fully breastfeeding is an infant who has had breast milk only and no other liquids or solids except a minimal amount of water or prescribed medicines.

Partial or combination breastfeeding is an infant who has received breast milk as well as some bottles of formula in any combination.

Artificial or formula feeding is an infant who is having no breast milk but has had alternative liquids such as infant formula with or without solid food.

Other definitions relevant to this study are as follows:

Breastfeeding duration measure is breastfeeding at four months postpartum.

Normal vaginal birth is a birth with a spontaneous onset and duration of labour, singleton foetus and a vertex presentation and a spontaneous vaginal birth.

Complicated labour and birth includes induction or augmentation of labour, epidural pain relief for labour or delivery, forceps or ventouse to assist the birth of the baby and/or episiotomy.

Caesarean section is either planned caesarean (without trial of labour, including repeat Caesareans), or unplanned caesarean section (after a trial of labour and not resulting in vaginal birth).

Total sample means all the participants in the study.

Normal birth sub-sample (NB sub-sample) means all the participants who had a normal birth in the study.

Lower segment Caesarean section sub-sample (LSCS sub-sample) means all the participants in the study who had a caesarean section.

1.8 Summary

This chapter, the orientation to the study, has introduced the research question, the aims of the study and the research method. The study was designed to explore birth and breastfeeding events and experiences and their influence on breastfeeding duration. The BBEQ and the clinical data collection tool were trialled in the study. The high caesarean section rate in New Zealand and the dearth of research information on the

impact of birth and early breastfeeding events and experiences on breastfeeding duration were the justification for the study. My own interest and Kathy Manhire's participation in the development of and literature review for the study was outlined. Finally operational definitions are provided.

A critical review of selected literature is presented in the following chapter.

CHAPTER TWO: LITERATURE REVIEW

The purpose of the literature review is to site the study within the context of the relevant existing knowledge (Polit & Beck, 2004). The literature reviewed in this chapter relates to the research question, and research studies and commentaries from various perspectives are used. The focus of the literature search was concerned with the impact that type of birth, particularly caesarean section had on breastfeeding. Much of the literature also referred to, or included vaginal birth in some way, and yet other studies focused on vaginal birth alone. These research studies and commentaries included the investigation of the physiological changes and psychological responses to caesarean section, the pharmacological input, and the health care practices that occur during and after caesarean section along with their potential impact on lactogenesis, breastfeeding initiation and breastfeeding duration.

The successful initiation of breastfeeding by a mother and her newborn is a complex and intricate process. It involves coordination of body movements and physiological events, response to sensory stimuli, and communicative behaviours between the mother and her baby (Kennell & McGrath, 2001; Nissen et al., 1995; Ransjö-Arvidson et al., 2001). If early breastfeeding is not optimal it may impact on the duration and enjoyment of the experience for both mother and baby.

A woman's experience of giving birth affects the beginning of breastfeeding and mothering (Weatherly, 2000). Breastfeeding is part of the physiological process of childbearing. If the normal physiological process of birth is disturbed through caesarean section, it could be hypothesized that caesarean section might also detrimentally affect other normal physiological birth processes. The concept of a

"cascade of intervention" occurs when the normal birth process is altered by medical intervention. It can be argued that caesarean section has a negative domino effect on the natural birth process and birth modality (Churchill, 1997; Gorrín-Peralta & Parrilla-Rodríguez, 2000). Disruption to breastfeeding might be considered another casualty of birth interventions and a final component of the cascade.

This review has examined the above proposition through primary research articles and occasional secondary sources. Databases searched included, Medline, The Cochrane Library, CINAHL, Index New Zealand and the National Bibliographic Database of New Zealand. Articles were unrestricted in time and but restricted to English language. Researchers from a wide range of ethnic cultures have studied caesarean section and its possible effect on the initiation and duration of breastfeeding. These include; the United States, where the majority of research appears to have been done, South America (Mexico, Brazil and Argentina), Scandinavia (Sweden, Finland, Denmark), Asia (Japan and India), the United Kingdom and Australia. Two European articles were reviewed, one from Turkey and one from Portugal. There was no related research found from New Zealand.

Results from the literature reviewed are inconsistent regarding the effect of caesarean section on breastfeeding duration. There is, however, a predominately negative association between caesarean section and the initiation of breastfeeding. Some studies suggest motivation and commitment override the earlier difficulties of breastfeeding following a caesarean section. A discussion of each of the perspectives and factors investigated, which include physiological factors, a pharmacological perspective, effects of surgery, the hospital environment, health care practices, time of onset of lactation,

psychological issues in relation to birth type (particularly caesarean section) and breastfeeding, follow.

2.1 Physiological Changes

Lactogenesis Stage Two (milk production after birth) and milk ejection from the breast requires the presence of several hormones, in particular prolactin and oxytocin, which interrelate synergistically with other hormones and neurochemicals. Changes in the hormone profile may delay lactogenesis and milk ejection. Caesarean section and instrumental births with abnormal foetal and maternal stress have been associated with a delayed onset of lactation (Chapman & Pérez-Escamilla, 1999b); the results, however, are equivocal and the relationships are complicated.

According to Chapman and Pérez-Escamilla (1999b), Chen, Nommsen–Rivers, Dewey and Lönnerdal (1998), and Lagercrantz and Slotkin (1986), labour and vaginal birth raise foetal and maternal catecholamine (noradrenalin, adrenaline and dopamine) levels, which are produced during stress by the sympathetic nervous system and appear to benefit the infant. These catecholamines produce a maximised state of readiness for life outside the womb, enhancing blood flow to vital organs, increasing glucose mobilisation, and promoting normal breathing. This may also facilitate maternal-infant attachment through arousal and alertness of the newborn and the mother. Extremely high levels of catecholamines are associated with foetal asphyxia. Planned caesarean sections, in particular and unplanned caesarean sections do not produce the same elevations of foetal catecholamine levels experienced during vaginal birth, which may disadvantage the newborn infant's initial adaptation to extra uterine life and the ability to breastfeed (Chapman & Pérez-Escamilla 1999b; Chen et al., 1998; Lagercrantz &

Slotkin, 1986). In a longitudinal study of 192 homogeneous women Chapman and Pérez-Escamilla (1999b) identified unscheduled caesarean section as one of the risk factors for the delayed onset of lactation. They suggested that maternal-infant stress, and metabolic and hormonal responses during labour and abnormal birth, might contribute to delayed lactation. In contrast, Weiderpass et al., (1998) in a Brazilian study of 655 women found the women were three times more at risk of stopping breastfeeding in the first month after planned caesarean section in comparison to women who had a vaginal birth and those who had an unplanned caesarean section. A large retrospective study by Pérez-Escamilla et al., (1996) of 9310 women in Mexico City found caesarean section to be a risk factor for initiation and for a short duration of breastfeeding; defined as breastfeeding for less than one month only. Neuro-hormonal factors were not specifically identified in these two studies.

Physiological and psychological stress induces adaptative mechanisms, specifically the sympathetic nervous system's production of catecholamines and stimulation of the hypothalamo-pituitary adrenocortical axis. Increased glucocorticoids (cortisone and cortisol) levels are produced as a reaction to stress by both mother and baby during labour and support glucose production, cell metabolism and renal and cardiovascular function (Davies, Blakeley & Kidd, 2001; Marieb, 2001). Cortisol also increases the binding of prolactin to mammary receptors and is necessary, with prolactin, for the expression of casein genes (Chen et al., 1998; Falconer, 1980). Elevated cortisol and cortisone levels of both mother and foetus occur during both normal and abnormal labours and birth (Van Cauwenberge, et al., 1987). In a small study of 50 women, 30 with a normal birth and 20 with abnormal deliveries (forceps), Van Cauwenberge, et al., found that all the mothers and foetuses had raised cortisol levels, which increased with

increasing foetal and maternal stress. There was no evaluation of breastfeeding rates or lactogenesis in this study.

Chen, et al., (1998) explored the physiological effects of stress during birth on the initiation of lactation through an examination of hormonal and catecholamine profiles of maternal and infant cord blood. Stress, indicated by raised cortisol and glucose levels in cord blood, was associated with long labours, maternal exhaustion, foetal stress and delayed lactation identified by the later presence of milk casein. It was conjectured that if the infant experiences excessive stress during the birth process this could interfere with the establishment of an adequate sucking response and that raised glucose might inhibit infant hunger cues. In this study there were only five mothers who had a caesarean section, all with lower concentrations of cortisol and glucose in cord blood, which Chen et al. (1998) suggest may be due to the non-vaginal birth passage experience. There was no observed delayed lactogenesis by these women. It was suggested that level of the elevation or lack of elevation of catecholamine and cortisol levels during birth is the important feature, which may impact on lactogenesis. Kulski, Smith and Hartman (1981), examined caesarean and vaginal birth mothers' milk composition during the first seven days postpartum, and found no differences in the composition or timing of milk coming in. They did not explore neuro-hormonal levels of the mother or infants.

According to Nissen et al., (1996) oxytocin release is stimulated by the second stage of labour, which does not occur with an unplanned caesarean section. They compared the oxytocin, prolactin and cortisol levels of 17 caesarean section and 20 vaginal birth mothers who were breastfeeding two days after birth and found elevated pulsation of oxytocin and prolactin levels in those who had vaginal births compared to caesarean

birth. They also suggested that maternal-infant closeness after birth may stimulate necessary endocrinal changes for lactogenesis, and there is often delayed contact between a mother and her baby after caesarean section. There was no demonstrated effect on the duration of feeding at two months by either group of mothers (Nissen et al., 1996).

Though there is no clear relationship between raised catecholamines during birth and an effect on lactogenesis there may be a clearer relationship between the effects of stress (post surgical pain) after birth on lactogenesis. Maternal stress and the release of catecholamines can inhibit the milk ejection reflex after birth and if this inhibition is repeated it may result in lower milk production due to incomplete emptying of the breast (Chen et al., 1998; Hirose, Hara, Hosokawa & Tanaka, 1996). Conversely Groer, Davis and Hemphill (2002) suggest that breastfeeding can diminish the stress response through neuroendocrinal activity, where low levels of oestrogen and higher levels of oxytocin and prolactin during breastfeeding suppress corticotrophin-releasing hormone. They suggest this protects the mother and baby from environmental stimuli so energy is used for milk production and nurturing.

2.2 Pharmacological Perspective

Caesarean section requires the use of regional (epidural or spinal) or general anaesthesia and the relief of post-surgical pain pharmacologically through narcotic, non-narcotic or continual epidural anaesthesia. The pharmacological impact of these drugs on breastfeeding occurs through the sedative effects on mother and baby, which impact on the delicate neurobehavioral process of the initiation of breastfeeding (Nissen et al., 1995). Maternal sedation is associated with decreased frequency of breastfeeding and

being less affectionate to the infant, which may impact on initiation of milk production, and duration of the breastfeeding (Arora & Gupta, 1990; Gathwala & Narayanan, 1991; James, 1999; Sepkoski, Lester, Ostheimer & Brazelton, 1992).

2.2.1 Analgesia

Infants who have received analgesia (narcotics) via their mother show decreased ability for self-quieting behaviour, diminished and delayed sucking and rooting reflexes and reduced orientation to visual and auditory stimuli (Hodgkinson, Bhatt & Wang, 1978). Nissen et al.'s (1995) observational study of 44 healthy infants two hours after birth suggested that pethidine may affect oral sensitivity and motor skills needed for shaping of the mouth and sucking. Coordination and recognition of the maternal breast may also be inhibited (Gorrín–Peralta & Parrilla–Rodríguez, 2000). Decreased newborn hand massage movements, which stimulate oxytocin, the hormone important for nipple erection, milk ejection and uterine contraction have also been observed (Ransjö-Arvidson et al., 2001).

Narcotic analgesia particularly pethidine (meperidine) has been shown to have marked sedative effects due to central nervous system depression (Belfrage, Boreus, Hartvig, Irestedt & Raabe, 1981; Hamza et al., 1992; Kuhnert, Linn, Kennard & Kuhnert, 1985). Maternal sedation increases the closer to the birth the opiates are given, and the newborn tends to be most affected if narcotics are administered within two to three hours before birth. The half-life of pethidine is three to four hours for the mother, but 13–23 hours for the infant, with half-life for the active metabolite, nomeperidine, being 62 hours (Matthews, 1989; Nissen et al., 1997; Rajan, 1994; Righard & Alade, 1990). The sedative effect also depends on the type of drug, dosage, number of doses and the

individual maternal–foetal metabolism (Crowell, Hill & Humenick, 1994). Fat-soluble pethidine metabolites can remain present for long periods (Walker, 1997; Wittels, et al., 1997); however the effect of narcotic analgesia on the duration of breastfeeding is not clear. It was investigated in six studies but breastfeeding duration was only assessed up to six weeks postpartum. Some studies found no association with duration of breastfeeding (Halpern, et al., 1999; Lawson & Tulloch, 1995; Riordan, Gross, Angeron, Krumwiede & Melin, 2000) while Rajan (1994), did find an association. Rajan followed 1064 women postnatally and administered a questionnaire at six weeks to assess breastfeeding duration. She found caesarean section mothers were significantly less likely to breastfeed especially those who had received pethidine within an hour of birth and a general anaesthetic. Neither nitrous oxide nor epidural anaesthesia appeared to affect breastfeeding duration in this study.

2.2.2 Anaesthesia

Anaesthesia, particularly regional anaesthesia appears to have less effect on initial breastfeeding behaviour (Halpern et al., 1999; Hirose et al., 1996; Nissen et al, 1996) but it may still impact on it. It appears to depend on the neurobehavioral outcomes that are investigated (Halpern et al, 1999; Riordan et al., 2000; Sepkoski et al., 1992; Walker, 1997; Weatherly, 2000). Sepkoski et al., (1992) investigated the effects of maternal epidural anaesthesia with bupivacaine on the infant's behaviour using the Neonatal Behavioural Assessment Scale, which was administered to 40 babies at one, three, seven and 28 days. Orientation and motor behaviour was poorer in the medicated group where the effects were dose related. The mothers in this epidural group reported spending less time with their infants in the first few days, whilst still in hospital. There was no comment or assessment of 'rooming in' practices in Sepkoski et al's., study.

There was also no assessment of maternal-infant interaction or breastfeeding initiation or duration and there may well have been an impact on maternal-infant behaviour.

Halpern et al., (1999) conducted a prospective observational study of 171 women in a breast-feeding friendly hospital environment in Ontario. They found that epidural labour analgesia with local anaesthetics and opioids did not impede breastfeeding at six to eight weeks postpartum and instead suggest hospital practices and a range of environmental issues at home and in hospital may have a greater impact on breastfeeding duration. There was no comparison with an unmedicated group. Hirose et al., (1996) found Bupivacaine to have the least effect of local anaesthetics on the neurological behaviour of infants. The researchers suggested that reduction of pain postoperatively with epidural bupivacaine decreases catecholamine release and so maintains hormonal equilibrium for breastfeeding.

Riordan et al., (2000) compared medicated and unmedicated women and their babies till six weeks and found labour medications impaired suckling in the early postpartum period (one to 50 hours). Epidural or intravenous analgesia effects were similar and if both forms were given the results showed a greater impact on breastfeeding. Lower scores on the Infant Breastfeeding Assessment Tool were used as evidence for this finding (readiness to feed, rooting, fixing, suckling time and maternal perception and satisfaction with breastfeeding). There was no significant difference at six weeks. Radzyminski (2003) found no significant differences in breastfeeding behaviours of babies at birth and at 24 hours of age between mothers receiving epidural analgesia and those who had no pain medication in labour. Both groups had spontaneous vaginal births and both bupivacaine and fentanyl doses were ultra low (0.6mg bupivacaine and 0.00175mg fentanyl per hour).

General anaesthesia sedates both the mother and baby, which may mean there is a delay in breastfeeding initiation, and the process may be blurred by the effects of the anaesthetic (Bick, MacArthur & Lancaster, 1998; Lie & Juul, 1988; Mathur et al., 1993). Lie and Juul (1988) compared the effects of general versus epidural anaesthetic on initiation and duration of breastfeeding until six months in two groups of caesarean section women. Those with an epidural anaesthetic had higher initiation and duration rates. They suggest this may be due to earlier maternal and infant contact, earlier partner participation and less weariness during the puerperium because epidural anaesthetic facilitates immediate mother-infant contact.

Post-operative pain has been reported as having a detrimental impact on women's ability to cope with their baby (Churchill, 1997). Women are, however, dependent on receiving the right information to gain most benefit from post-operative analgesia, which in general is not contraindicated for breastfeeding (Hale, 2002).

2.3 Effects of Surgery

A combination of fatigue, pain and the physical limitations of surgery may delay and hinder maternal-infant interaction and breastfeeding (DiMatteo et al., 1996; Hirose et al., 1996; James, 1999; Rajan, 1994). DiMatteo et al., compared 23 psychosocial outcomes between vaginal and caesarean births in a meta-analysis. Three studies showed increased maternal fatigue and poorer physical functioning for caesarean mothers up to four years after the surgery and reduced levels of maternal–infant interaction up to five months after birth, which was related to fatigue and pain. Thompson, Roberts, Currie and Ellwood (2002), in a study of maternal health problems

after birth, concur with DiMatteo et al's., findings. Women who had a caesarean section reported more exhaustion and lack of sleep.

In a Finnish study, Tarkka, Paunonen & Lappiala (1998) explored contributions to breastfeeding success for 326 first time mothers and found that women who perceived their state of health as positive after birth coped better with breastfeeding. Mothers who were anxious, tired or upset managed less well with breastfeeding and a negative birth experience did not impact on the breastfeeding experience. Ford and Labbok (1990) consider that women suffering maternal postpartum illness after caesarean section may be at greater risk of breastfeeding failure. These authors suggest that serious maternal health concerns during labour and the postpartum period are a factor in decreased duration of breastfeeding for some women.

There may be expectations of diminished capability to breastfeed after surgery and cultural beliefs about post surgical care, which may impact on breastfeeding (Arora & Gupta, 1990; Kapil, Kaul, Vohra & Chaturvedi, 1992; Tarkka, Paunonen & Lappiala, 1999). Fawcett and Weiss (1993) explored cultural responses and adaptation to caesarean section. Their exploratory study used the Perception of Birth Scale to assess responses to birthing experience by 45 white Caucasian, Hispanic and Asian women in the United States. They found no substantial differences in adaptation to caesarean section by any groups, but suggested the "normalizing" effect of an increasing caesarean section rate may be the reason for this finding. Past research, such as that by Fawcett, Pollio and Tully (1992), Kearney et al., (1990), and Mercer, Hackley and Bostrom (1983) for instance, had shown different responses. Positive changes in hospital practices may also provide better support for women from different ethnic cultures. The groups, however, were not of equal sample size, there were some

language difficulties and the samples were small. In contrast Arora and Gupta (1990) describe some ethnic beliefs such as the necessity of resting after an operation for a full recovery, which may preclude the combination of breastfeeding, and recovery from caesarean section.

2.4 Hospital Environmental Factors

Martell (2003) analysed the perceptions of mothers at three weeks in a small North American study and found multiple negative environmental factors in the hospital. These included equipment (intravenous stands and monitors), uncomfortable beds and poorly designed room configurations and bathing facilities, difficulties in accessing babies in cots, lack of privacy and being interrupted, noise and unfamiliar sounds and bright lights. The consequences for the mothers included feeling unsafe, fatigued, and fewer opportunities for mobility for daily activities and mother and baby cares. Rajan (1993) had previously identified the provision of comfortable chairs contributed to breastfeeding success.

2.5 Health Care Practices

The literature concerning healthcare practices, which might affect breastfeeding duration, that was found and reviewed in this section includes; effects of surgery including post operative use of analgesia and operating theatre and care provided immediately following the caesarean section, concomitant mother-infant skin-to-skin contact, initial breastfeeding opportunities and breastfeeding frequency following birth, maternal perception of lactation onset, the use of supplementary infant feeds in hospital, midwifery/nursing support following birth and amount of mother-baby separation

during the hospital stay either because of maternal or infant illness, or lack of consistent 'rooming in'.

The Ten Steps to Successful Breastfeeding are the cornerstone of the World Health Organisation (1989) *Baby Friendly Hospital Initiative*. The World Health Organisation summarises the ten steps to breastfeeding success through research studies, the maternity practices necessary to support breastfeeding. Steps Two, Four, Five, Six and Seven prescribe the need for training of staff to support women to breastfeed, the importance of initiating breastfeeding within 30 minutes, practicing rooming in, and giving no supplements to the newborn unless medically indicated (World Health Organization, 1998).

2.5.1 Lack of Early Concomitant Skin-to-skin Contact and Early Breastfeeding Opportunity

Observation of normal births has illustrated that newborn infants, if placed on the mother's abdomen, bare skin to bare skin, make crawling movements at around twenty minutes and begin rooting and suckling at the breast at around fifty minutes is interrupted or delayed it may slow lactogenesis, through disruption to the maternal and infant responses to each other (Gathwala & Narayanan, 1991; Kennell & McGrath, 2001; Ransjö-Arvidson et al., 2001). This may also affect the breastfeeding duration. Pérez-Escamilla, Pollitt, Lönnerdal & Dewey (1994) concluded in a meta-analysis of seven studies that there was a beneficial effect of early maternal-infant contact, on breastfeeding duration, at two to three months. Anderson, Moore, Hepworth and Bergman (2003) in a Cochrane review of 17 studies also conclude that early concomitant skin-to-skin contact appears to have some clinical benefits particularly

regarding breastfeeding outcomes and infant behaviour. This finding was not conclusive as the sample was heterogeneous and could not exclude the effects of breastfeeding guidance and paternal presence. Ali and Lowry (1981) compared early contact (less than one hour), with the routine first contact (on average, about nine hours in 74 mothers and babies). The rates of full breastfeeding at six and 12 weeks were higher for the early contact group.

It is common practice immediately after a caesarean section for the baby to be first assessed by health professionals then dressed and wrapped, shown to the mother, if she is awake, and held by someone, other than the mother till the operation is completed. The baby may stay with the mother while she recovers or is taken directly to the postnatal ward. This means that the initial breastfeeding opportunity is often hours after the birth and concomitant skin-to-skin contact, which in some cases may not occur at all. These practices may vary from hospital to hospital.

Babies left for only short periods, on their mother's abdomen showed suckling difficulties (Righard & Alade, 1990). The authors of this study of infants, who were delivered normally, were concerned with the effect of early contact on early suckling. They assigned these infants to a contact or a separation group. Twenty-four of the immediate contact group who stayed with their mothers for at least an hour after birth (38 infants in total) were suckling effectively after 49 minutes. Only seven of the separation group sucked effectively, following short contact immediately after birth, then separation and return to their mothers later. Other stressors, which impacted on effective sucking, were maternal analgesia (pethidine), anaesthesia, and possibly maternal experience, support from health professionals, individual infant characteristics

and experiences, such as oral suctioning, during and after birth.

Prolonged maternal-infant separation after caesarean section are risk factors for unsuccessful initiation and fewer breastfeeds which may result in a delay in lactogenesis (Aliperti & MacAvoy, 1996; Banapurmath & Selvamuthukumarasamy, 1995b; Bernard-Bonnin, Stachtchenko, Girard & Rousseau, 1989; Chapman & Pérez-Escamilla, 1999a; Lawson & Tulloch, 1995; Mathur, et al., 1993; Procianoy et al., 1984; Sözmen, 1992; Tamminen, Verronen, Saarikoski, Göransson & Tuomiranta, 1983; Yamauchi & Yamanouchi, 1990). Banapurmath and Selvamuthukumarasamy (1995b) studied a sample of 1279 mothers in India. In this homogeneous sample, caesarean section was the significant factor for giving prelacteal feeds, delayed initiation of breastfeeding and a lower number of feeds per day. Yamauchi and Yamanouchi (1990) explored breastfeeding frequency in the first 24 hours of full term neonates following normal vaginal birth. If the infant had over seven feeds in that period they had a greater milk intake on days three and five compared to those infants who had fewer feeds. In a study of 100 caesarean women in India, Mathur et al. (1993) investigated the incidence of prelacteal feeds, and the effect of separation of the baby from its mother on breastfeeding rates at discharge. Those babies who had never been separated and started breastfeeding early had higher breastfeeding rates.

Caesarean section may result in a decision not to breastfeed. DiMatteo et al., (1996) in a meta-analysis found nine studies, which revealed a negative association between choice of breastfeeding and caesarean section. There were, however, 13 studies that showed no significant difference between vaginal births or caesarean section for continuing breastfeeding up to and after three months. Tamminen et al., (1983) found in a sample of 1701 women that caesarean section affected the incidence of

breastfeeding but not the duration up to six months. They concluded that maternal-infant separation, in association with the infant being in poor condition after birth was most likely to be the main factor in breastfeeding failure rather than the operation per se.

Mother-infant separation appears to have the most significance of all negative health care practices on initiation of breastfeeding but the results are equivocal for the effect on duration of breastfeeding. Vestermark, Høgdall, Birch, Plenov and Toftager-Larsen (1990) investigated the initiation and duration of breastfeeding of 370 women who had had a normal birth, vacuum extraction or a caesarean section. Though those infants born by caesarean section had had later initial suckling (two to six hours) after birth, were given formula more often, fed less at night and their mother's milk came in later, the prevalence of breastfeeding at three months was similar to mothers who had had normal births. This contrasts with the findings of Procianoy et al., (1984) who found in a homogeneous sample of 95 breastfeeding women who had had either a vaginal birth (spontaneous birth or forceps extraction not specified in study) or caesarean and were interviewed on discharge and at two months, that significantly higher numbers of the caesarean sample had discontinued breastfeeding. The different length of the separation periods may be significant. In the Procianoy et al., study, the caesarean mothers and babies group were separated for periods of up to 12 hours compared with a separation period of one to three hours in the Vestermark et al., (1990) study. Rowe-Murray and Fisher's (2002) prospective longitudinal study of 203 primiparous women in four different hospitals concluded that caesarean section was a barrier to the early initiation of feeding but found no significant association with duration of feeding at eight months.

2.5.2 Formula/supplements

Supplementation by formula discourages infant breastfeeding and reduces and delays milk synthesis. The early use of formula supplements may affect breastfeeding initiation and duration (Aliperti & MacAvoy, 1996; Mathur et al., 1993; Pérez-Escamilla et al., 1993; Samuels, et al., 1985). Pérez–Escamilla et al., (1993) studied 165 women in Mexico. These authors found that women who were fully breastfeeding at one week were more likely to continue for two months or more than women who were only partially breastfeeding. Aliperti and MacAvoy (1996) explored the effects of supplementation on breastfeeding duration in a sample of 70 mothers. The experimental sample, who received minimal supplementation, was exclusively breastfeeding at six weeks in greater numbers. Samuels et al., (1985), in a prospective study, explored the incidence and duration of breastfeeding in a heterogeneous sample of white, black, Hispanic and Asian women. Infants were routinely given formula unless requested not to. Supplementation had the most significant effect on duration of breastfeeding although, given that mothers had to be proactive for their babies not to be supplemented, this may have more to do with motivation. Caesarean section mothers were less likely to breastfeed and were more likely to have stopped breastfeeding by four months postpartum with the most rapid rate of breastfeeding cessation occurring in the first two weeks. Some studies, however, did not find an association between minimal initial supplementation and breastfeeding initiation and duration (Datta, 1990; Vestermark et al., 1990).

2.5.3 Ward Staff Support

Breastfeeding after caesarean section requires support and advanced skills from health professionals (Banapurmath & Selvamuthukumarasamy, 1995b; Fetherston, 1995; Kearney et al., 1990; Matthews, 1989; Scott, Landers, Hughes & Binns, 2001). Banapurmath and Selvamuthukumarasamy found that in a sample of 250 women, those post caesarean section mothers who were supported by postnatal staff to breastfeed initiated their first feed on average within six hours. This was in comparison with mothers who were unassisted, on average beginning breastfeeding at 14 hours. Kearney et al., (1990) found a supportive breastfeeding hospital culture and environment and the commitment of the mother to be defining factors in breastfeeding success or failure. In a study of 121 homogeneous primiparas there was no difference in breastfeeding duration between those who birthed vaginally (a spontaneous birth or forceps extraction were not specified this in study) or by a caesarean section, despite delay in initial feeding. Mothers, in Hailes and Wellard's (2000) qualitative study, identified a number of variable issues concerning midwifery support in hospital. These include lack of consistent support during the initiation and duration of the breastfeed, and some midwives "taking over' the breastfeed.

2.6 Onset of Lactation

Chapman and Pérez-Escamilla (1999a) found that if women perceived a delayed onset of lactation (over 72 hours), which was measured by breast symptoms (i.e. fullness, heaviness, pain, leakage, tingling), the perception of delayed onset of lactation decreased the duration of breastfeeding significantly, despite women having planned to breastfeed to six months. They suggest maternal anxiety, early separation and

introduction of supplements, which may impact on milk supply, may be a factor in this discontinuation. Tarkka et al., (1998) found a positive early breastfeeding experience and maternal perception of early lactation has an impact on breastfeeding duration.

2.7 Psychological Factors

Breastfeeding initiation and duration are affected by emotional and psychological variables, which may be altered by caesarean section. Confidence, motivation and commitment have been shown to contribute to successful breastfeeding (Dennis, 1999; Ertem, Votto & Leventhal, 2001; Janke, 1988; Kearney et al., 1990; Papinczak & Turner, 2000; Tarkka et al., 1999). Janke (1988) investigated 215 women to try and identify the differences in infant feeding practices among women who had a caesarean section and those who had a vaginal birth (spontaneous birth or forceps/vacuum extraction was not specified in the study). In the Janke (1988) study successful breastfeeding was defined as those women who planned to breastfeed for six weeks and who were still breastfeeding at least five feeds a day at six weeks. Whereas the vaginal birth mothers revealed a number of variables associated with successful breastfeeding such as education, marital status, partner support, preparedness and commitment to breastfeeding, the only variable associated with successful breastfeeding found for caesarean mothers was commitment. Lawson and Tulloch (1995) examined the role of prenatal intentions and postnatal practices on breastfeeding duration of 78 primiparas and found the only significant factor postnatally was early contact and breastfeeding. Breastfeeding problems, type of birth and confidence were not significant. A preconceptual decision to feed, a negative attitude to formula and a higher education level, were positive prenatal factors associated with breastfeeding at three months.

The physical and emotional experience of a caesarean section, particularly one that was unplanned, may result in a diminution of confidence, satisfaction and strength to cope with the demands of breastfeeding (Datta, 1990; DiMatteo et al., 1996; Kearney et al., 1990; Procianoy et al., 1984). Kearney et al., suggest that committed and supported mothers who have had a caesarean are more able to override the effects of the surgery than those who did not appear committed. Mothers experiencing caesarean section may need extra support.

A mother's perception of the infant's positive response to breastfeeding reinforces her confidence about breastfeeding and affects duration. If the initial mother–infant breastfeeding experience has been less than optimal then this may impact on the baby's response to breastfeeding, which in turn affects the mother (Ertem et al., 2001). Maternal-infant interaction may differ between women who have had a caesarean section and those who have had vaginal births (spontaneous birth or forceps/vacuum extraction were not specified in study). Some studies have shown infants cry more and mothers appear less affectionate, less communicative and involved with their newborn after caesarean section (DiMatteo et al., 1996; Gathwala & Narayanan, 1991).

2.8 Summary

The literature relevant to the study has been reviewed in this chapter. There is no conclusive evidence that type of birth and healthcare events have an impact on breastfeeding initiation and breastfeeding duration, although there is some evidence perinatal experiences and events become extraneous once breastfeeding is established. Maternal care practices after caesarean section alter from country to country, culture-to-culture, hospital-to-hospital, and over time. There was no literature found which,

specifically examined birth and breastfeeding events and their influence on breastfeeding duration in New Zealand. The literature reviewed here suggests there are multiple, complex and varying factors which affect breastfeeding in different environments. For this reason a descriptive study of the effects of type of birth on the duration of breastfeeding in a provincial New Zealand environment will add to the understanding of this topic. The methods used to undertake this descriptive study are presented in detail in the following chapter.

CHAPTER THREE: RESEARCH METHOD

3.1 Introduction

This chapter presents the aims of the study and the research design. The study used a non-experimental, exploratory methodology and data was collected retrospectively. The selection of the study instruments and development is discussed. The primary instrument of data collection was the Birth and Breastfeeding Experience Questionnaire (BBEQ) and the clinical data collection tool was the secondary data collection method. Both tools were developed specifically for this study and are discussed in this chapter including the processes to test construct and content validity and reliability of the BBEQ. The ethical issues of the study are discussed. The methods used for sample selection, recruitment into the study, data collection and the statistical methods used to analyse the data are described.

3.2 Aims of the Study

The aims of this study were outlined on pages 8 and 9. These were: firstly to explore birth and breastfeeding events and experiences and describe their influence on the duration of breastfeeding for women who had given birth in the Hawke's Bay region of New Zealand, and, secondly to trial the BBEQ and clinical data collection tool. The project was undertaken between January 2002 and March 2004.

3.3 Research Design

This study began with a phenomenon of interest: what was happening with breastfeeding for a population of women birthing in the Hawke's Bay region of New Zealand? As discussed in Chapter Two, the literature search revealed little written knowledge concerning the influence perinatal events and experience might have on breastfeeding duration in New Zealand women. The researcher believed that a study, which explored the topic, would provide some elucidation of the phenomenon and thus benefit both breastfeeding women, and the midwifery profession. It was also anticipated that multiple and complex historical data would be needed to investigate the question and as such a quantitative methodology was appropriate using a non-experimental retrospective approach. The researcher further anticipated the study could involve large numbers of busy participants who would reside in a wide geographic area. A self-administered survey of some kind, distributed by mail, appeared the most appropriate way to collect the data for the study. Although it is acknowledged that self-reporting surveys yield data that is difficult to verify (Polit & Beck, 2004), the data can be difficult to obtain in other ways. Consequently a quantitative questionnaire was determined to be the most effective method of collecting the data.

Information was sought concerning women's previous breastfeeding experience and intention, perinatal events and experiences including breastfeeding up to four months postpartum, when and why breastfeeding ceased and some demographic data in two sub-samples of women. These were women who had a normal vaginal birth, and women who had a caesarean section. Information was gathered using the BBEQ, a semi structured questionnaire (Appendix I), and a clinical data collection tool (Appendix II). The BBEQ had nominal and ordinal scale closed questions, some open-

ended questions and opportunity for comments. The clinical data collection tool was used to confirm the entry criteria, as well as to obtain specific details about the respondents' labour, labour or birth interventions, medications, and time of first breastfeed.

3.4 Instrument Selection

The study proposal met the criteria for survey research identified by Cluett and Bluff (2000). Survey research is a quantitative, non-experimental methodology commonly used by the social sciences in an attempt to provide a snapshot of a sample's attitudes, beliefs and values at a given point in time (Davidson & Tolich, 1999). Surveys are useful where, as in this study, the aim is to describe and explore a topic where the results are generalisable, correlational (not causal) and objective, although they tend to generate information that is relatively superficial. This makes them better suited to extensive rather than intensive analysis as in this exploratory study (Polit & Beck, 2004). It was anticipated that this study would involve a clearly defined target population and the majority of the respondents would be able to provide written answers to the questions, which are essential components of survey research (Cluett & Bluff, 2000). A questionnaire was then required to conduct the survey in the target population. No specific scales or tools were identified during the literature search, which could be used, as they did not appear to fulfil the requirements of the study. Some questions from previous studies, which explored variables relating to the research topic, were adapted for the BBEQ.

Some of the parameters identified in the literature relating to physiological and pharmacological data about each participant's labour and birth experience would be best

identified by examining the respondent's hospital records and a separate clinical data collection tool was developed to facilitate this task and is further discussed on page 45.

The aims of this study were based on the assumption that women's previous breastfeeding experiences and perinatal events and experience including type of birth could have an impact on the woman's breastfeeding duration. The aim of the BBEQ and the clinical data collection tool was then, to retrieve information that had been identified in the literature, in sufficient quantity to suggest validity and be generalisable to the research topic.

3.5 Ethics Approval and Ethical Issues of the Study

As in all human subject research, there was a requirement for this study to ensure the rights of all parties were protected (Polit & Beck, 2004). The ethical aims of the study were therefore to, safeguard the rights of participants, protect the rights of HBDHB Maternity Services and finally, protect the ethical and moral integrity of the researcher. The following section describes the steps taken to meet the ethical challenges that arose in this study.

3.5.1 Ethics Committees' Involvement

Three ethics committees scrutinised and approved the proposal, the Hawke's Bay Ethics Committee, the Massey University Human Ethics Committee, and Eastern Institute of Technology Hawke's Bay Research Ethics Committee. Their letters of approval are included as Appendices X, XI and XII. Consultation concerning the proposed study format and process occurred with Iwi groups, a Pacific Island Peoples Health Group, the

HBDHB Maternity Service Manager and the HBDHB Maternity Quality Review Group during the study development.

3.5.2 Access to Participants

The study proposal required access to the HBDHB Maternity Service database to identify the potential participants. There were legal and ethical issues concerning a researcher's ability to access the maternity services database for purposes for which it was not intended. To find a way in which this could be done within New Zealand's ethical and legal frameworks, I, the researcher, instigated a preliminary meeting with a sub-group of the Hawke's Bay Regional Ethics Committee. The sub-group believed that if a hospital employee identified the potential participants from the maternity services database, undertook the first mail-out and the mail-out of the study reminder-to-participate postcards, then ethical obligations would be upheld. The HBDHB Maternity Services manager was also consulted during the study development concerning a way of accessing the maternity service database, which would meet ethics approval and the final study proposal was developed following her advice. The HBDHB Maternity Services manager then supported the research proposal when the application went to the ethics committees. Once ethics approval had been gained the HBDHB Maternity Services manager gave approval for the maternity services database to be searched for a list of potential participants.

3.5.3 Ethical Issue of the Second Person Participant

Although the study proposed to examine women's experience around birth and breastfeeding the researcher recognised that the study involved a mother-baby dyad: the

baby or infant being the second person participant. The researcher and the HBDHB Maternity Services manager recognised that mothers who had given birth in the regional hospitals might have altered family circumstances following the birth of the baby. Such circumstances could be; family break-up, child fostering or adoption, infant illness or even infant death.

The researcher was unable to determine a way to identify families who had experienced adverse life events following discharge from the hospital. Mothers having more than one birth in the study time period further complicated the situation. To ensure research beneficence, self-determination and justice for families, the researcher elected to protect the mother's autonomy, and ensure justice, by the inclusion of a specific statement in the participant letter of invitation (see Appendix III). This statement acknowledged the researcher's awareness of possible altered circumstances for the family and the researcher's wish not to cause the family any distress. The change in the wording of the letter of invitation for the study required a second application to two of the ethics committees (Hawke's Bay & Massey University) for consent for a variation to the study proposal. Both committees approved the variation. A further protection to the study's ethical integrity was that the sampling plan allowed the identification of mothers and infants experiencing adverse health incidents prior to discharge from hospital who were excluded from the study.

3.5.4 Potential for Harm

It was believed that completing the BBEQ was unlikely to adversely affect the mother, although the researcher acknowledged that recall could precipitate both good and bad reflections of birth and breastfeeding events, as suggested by Tonkin (1998). The

following arrangements were made should any respondent have an unexpected adverse consequence of recounting their birth and breastfeeding experiences. Women could elect to have support of their choice from; the HBDHB Breastfeeding Coordinator, the regions primary Maori maternity care provider, or their LMC. The researcher would also find other avenues of support if requested to do so by a participant. No participant has approached the researcher with concerns about an adverse response when completing the questionnaire.

3.5.5 Informed Consent

Informed consent is an essential part of a study such as this one, and it has many elements. These include; that participants have adequate information about the study, have the information in language which they are able to understand, have the power of free choice to either consent to, or decline to participate, the right to withdraw from the study at any point without prejudice (Polit & Beck, 2004). The study met these requirements with an information sheet (Appendix V) that outlined the study purpose, process and the participant rights. Signed consent (Appendix VI) was required for participation and the clinical data collection. The process for gaining consent is discussed on page 52 later in this section.

3.5.6 Information Security and Storage

The completed BBEQs, the completed clinical data collection tool and the participants' signed consent forms were all stored separately in secure storage. This material will be securely stored for five years as required by the Massey University Human Ethics Committee.

3.6 Development of the Questionnaire

The BBEQ's initial development was based on a literature review (Chapter Two), where large numbers of factors were identified that could influence how long a woman breastfeeds. No specific scales or tools were used from the literature, as those located did not appear to fulfil the requirements of this study, although, as Beck (1998) comments, it would have been ideal to use an existing instrument, which had already been assessed for validity and reliability. Questions from previous studies, which explored variables relating to the research topic, were adapted for the BBEQ. These questions were designed so women could identify their own experience during the birthing and early parenting in a structured way to generate the data being sought, as recommended by Minichiello, Sullivan, Greenwood and Axford (1999).

3.6.1 The Structure of the BBEQ

The BBEQ had two sections. The first had 36 items divided into four categories; antenatal intentions and breastfeeding intention, birthing and breastfeeding experience in hospital, breastfeeding experience after discharge from hospital. The second part was a demographic section and had six items. These were; age, education, occupation, ethnicity, number of children and date of the birth of the baby under discussion. A tick box format was used for the closed questions to minimise the amount of time required to complete the BBEQ. Space was left beneath many of the questions for women to make additional comments or clarify their responses. Open-ended questions and comment sections allowed respondents to elaborate on their answer, or to give new information. In many instances the space allocated was not sufficient and women found

additional space in the margins, on the back of the pages, or even used additional paper to give information.

Demographic information was kept simple and was placed on the back page of the BBEQ in accordance with the recommendation by Davidson and Tolich (1999). This recommendation is so as not to deter participants who might object to providing personal information (Cluett & Bluff, 2000; Davidson & Tolich, 1999). All respondents completed this section.

The BBEQ was to be completed when the respondent's baby was at least four months old. It was structured to be easy to complete with well-spaced questions on eight pages of size 14 font and expected to take approximately 15 minutes to complete.

3.7 Refinement of the BBEQ

3.7.1 Pre-Pilot Stage

The pre-pilot stage was used to test that the researcher's ideas and assumptions were not considerably different from the sample that was to be questioned; an important step if the research is to be valid (Gillham, 2000). Having three potential respondents complete the BBEQ and comment on it, achieved this. Minimal changes were made following this step. Furthermore the three respondents commented that the BBEQ was clear, interesting and quick to complete.

3.7.2 The Pilot Test

The pilot test included 20 potential respondents and was used to simulate the real study, which is a further important research step according to Gillham (2000). Two LMC midwives were asked to send the BBEQ to mothers who had either a normal birth or a caesarean section, were breastfeeding on discharge from the midwife's care and whose baby was at least four months old. A stamped addressed envelope was included. The responses from the pilot study provided information as to the suitability of the questions, if there was sufficient space available to provide further written comment, and appropriateness of the demographic questions. The data gained from the pilot test was not statistically analysed because the researcher was not able to apply the sampling plan to selection of the potential participants.

3.7.3 Response to the Pilot Test

A positive response rate of 50% was achieved (Gillham, 2000). Respondents tended to answer all the open questions or none at all, which could have been related to lack of time or interest. The respondents made comments where there was space for them in the open comment sections and, occasionally, added comments where no space had been allocated. Questions about their breastfeeding experience were always answered which indicated its importance for the participants. Almost all the questions were answered. All participants answered some of the demographic questions. One respondent failed to complete the ethnicity question. This may have been a personal choice or missing the question as it was at the end of the BBEQ. No explanation was provided. No comments were made about non-applicability of any of the questions: however this information was not solicited in the pilot study. The researchers

interpreted the absence of participant comment as validation of the BBEQ for both clarity of content and question construction.

The following change was made to the questionnaire as a result of testing the questionnaire. A question asking for the date of the birth the respondent was discussing was included in the BBEQ after the pilot testing. This was seen as necessary because the sample was to be chosen from an extended time period. The researcher also anticipated that women could report birth and breastfeeding events other than that identified when applying the sampling plan. This proved to be fortuitous as it enabled the researcher to identify the birth a respondent was reporting during the clinical data collection stage of the study.

3.8 Development of the Clinical Data Collection Tool

The clinical data collection tool was developed from the literature review. Its purpose was to confirm entry criteria for the study and to identify clinical events and experiences surrounding birth. Criteria identified included: admission to hospital prior to labour commencing, pharmacological data, length of labour, type of caesarean section, type of anaesthetic, validation of the respondent's information on the time of first breastfeed following birth, the baby's birth weight, and Apgar score at one minute following birth.

The clinical data collection tool was in a spreadsheet format with variables under investigation along the top and the participant identification numbers down the left hand side (see Appendix II). Clinical details extracted from the respondent's maternity records were entered in the appropriate spaces alongside her research identification number.

The clinical data collection tool also allowed the researcher to confirm women's recall of clinical events as this recall can be subject to variation (Harlow & Linet, 1989; Hewson & Bennett, 1987). However, there can be for most items, good agreement between the mothers' recall and hospital records (Martin, 1987). There may also be poor concordance between mothers' recall and patient clinical data and it is not always possible to assume that the 'event' has not occurred (Cartwright, Jacoby & Martin, 1987; Hewson & Bennett, 1987; Martin, 1987; Oates & Forrest, 1984). The reasons for clinical discrepancies identified as relevant to this study are: information not being extracted by the reviewer (Cartwright et al., 1987), problems of interpretation and definition, inaccurate or missing data in the clinical notes, mother's knowledge deficits, or mothers not understanding or misinterpreting the questions (Martin, 1987). The effectiveness of the clinical data collection process is discussed on page 58.

3.9 Research Information Sheet for Lead Maternity Carers

An information sheet (Appendix VII) that explained the purpose of the study, the involvement of women and the clinical data collection purpose and process, was posted to the region's LMCs. The researcher deemed this information sheet to be important in three ways. Firstly, that well informed LMCs would be able to respond to potential participants with accurate information concerning the study. Secondly, that sharing information concerning the research was an important professional responsibility and finally, information should mitigate any concerns about the research those LMCs might have had about the research purpose and process.

3.10 The Main Study: Recruitment of Participants

3.10.1 The Sampling Plan

Once the study question had been determined a sampling plan was developed to establish the sample size and how the participants were to be selected (Polit & Beck, 2004). A power analysis was not conducted because the number of caesarean births in the region limited the sample size. The researcher was also unable to identify any comparable study from which to work.

A statistician was consulted for advice on the most appropriate sample size given the population size and time constraints due to the retrospective nature of the study. The statistician also provided advice on the development of the sampling plan and the randomisation process. Randomisation was done to ensure the selected sample was representative of the two sub-samples of the population of interest for the current study, that is that each woman in the two sub-samples had an equal and independent chance of being selected (Polit & Beck, 2004). Following the advice of the statistician, the researcher endeavoured to include the largest accessible population possible, but recognised that the more extended the time period became, the more the validity was compromised by events outside the control of the study.

The sampling plan identified the study population, specified the sampling method and the sample size. The final sample size was constrained by a number of factors outside the researcher's control and is discussed in the study limitations section in Chapter Six.

3.10.2 The Sampling Frame

The sampling frame, which is "a list of all the elements in the population from which the sample was drawn (Polit & Beck, 2004) was established. The accessible population was women whose baby was born four months before the selection process commenced, who had given birth in the HBDHB Maternity Services, and who met the inclusion criteria, or were not eliminated by the exclusion criteria for the study.

3.10.3 Inclusion and Exclusion Criteria

Women were included if they:

- Had recently given birth in the HBDHB Maternity Services region
- Had a baby born either by normal vaginal birth, or a caesarean section, as defined in Chapter One, page 12 at least sixteen weeks prior to the first mail-out
- Had an uncomplicated pregnancy
- Had no maternal illness during the pregnancy
- Planned to breastfeed or combination feed
- Had a healthy baby over 37 completed weeks of gestation at birth
- Had a baby had a birth weight of more then 2500gms
- Had a baby who had an Apgar score of seven or more at one minute.

Women were excluded from the study if they:

- Had a maternal illness during the pregnancy
- Had a labour or birth that was not normal, as defined in Chapter One, page 12.
- Had a multiple pregnancy
- Elected to feed their baby with formula milk from birth

- Were identified as having had their baby adopted
- Had a baby with a significant illness or a significant birth defect
- Had a baby who required admission to a Special Care Baby Unit

3.10.4 Applying the Sampling Plan

The sampling plan was applied as follows. The HBDHB Administration Coordinator searched the maternity services database applying the inclusion and exclusion criteria until more than 300 women having had a caesarean section were identified. Three hundred and seven women were identified in a time period from May 1999 to 1st August 2002. All eligible women who had a normal birth over the same time were then identified following application of the inclusion and exclusion criteria. Seven hundred and fifty eight women who had a normal birth were identified.

The HBDHB Breastfeeding Coordinator then undertook the next phase of the sampling plan after being briefed by the researcher. The researcher was also available by phone contact for consultation during the process of identification of those who would receive the first mail-out.

The HBDHB Breastfeeding Coordinator then further screened the sample lists to confirm the inclusion and exclusion criteria had been correctly applied. The two lists of women were sequentially numbered. A list of computer generated randomised numbers was then used to identify two hundred and fifty women from each list. These women were sent an invitation to take part in the research.

A colour code on the participant contact pack envelope was used to identify the sub-sample the respondent was drawn from. This was done so the sub-sample could be identified if the pack was returned marked addressee unknown. The Breastfeeding Coordinator sent a research pack to the next woman drawn from the appropriate sample list.

3.10.5 The Research Participant Contact Pack

The initial mail-out included the following documents: an invitation to participate letter (Appendix III), a support letter from the HBDHB Maternity Services manager (Appendix IV) and a pre-stamped addressed return envelope. The invitation to participate letter explained the purpose of the study and invited women to return the 'request for further information' enquiry slip to the researcher. The HBDHB Maternity Services manager's letter explained her support for the study and invited the woman to respond to the approach. The potential participants returned their response slips to the researcher.

3.10.6 Initial Contact Follow-Up Process

The women who had not responded to the first mail-out by the beginning of the fourth week following contact were sent a research reminder postcard (Appendix VIII). The researcher gave a list of the women, who had responded to the first mail-out, to the HBDHB Breastfeeding Coordinator. She was then able to identify those who had not responded and mail-out the post card.

3.10.7 The Participants' Research Pack

The second mail-out was the research pack and was posted to women who had returned a further information inquiry slip to the researcher. The research pack contained; a research participant information sheet (Appendix V), a consent form (Appendix VI), the BBEQ and two stamped, pre-addressed envelopes, one for the consent form and one for the BBEQ. The women enrolled and participated by signing the consent form, completing the BBEQ and returning them in separate stamped, pre-addressed envelopes.

The information sheet (Appendix V) informed women of the purposes of the study, their role in the study, ethical issues including consent to participate, information handling, and their right to withdraw from the study at any time without jeopardy, information concerning the safe-keeping of the woman's information and the process for withdrawing from the research should they wish. Information was also provided regarding the purpose of the clinical data collection emphasising that participation was voluntary. The information sheet contained contact details for the researcher for further information, or to have any concerns addressed. Contact details were also provided for the research supervisor, the Hawke's Bay and Massey University Human Ethics Committees and Kathy Manhire as requested by the Ethics committees. Several women phoned the researcher for further information about the study. Others, who had more than one baby in the study time period, enquired as to which birth they should discuss. Three women requested a second questionnaire as they wished to discuss two births.

3.10.8 Consent to Participate: The Process

The consent form had two sections: the first for consent to the study and the second for consent to access the participant's maternity clinical records. Non-consent for access to the woman's maternity clinical record did not exclude the woman from being part of the study. Each BBEQ had a research identification number corresponding to that on the consent form the woman received. This allowed the researcher to confirm consent and then link their BBEQ data with their clinical data.

Most of the consent forms were returned in a separate envelope with the others being returned with the BBEQ. The research numbering system could have allowed the researcher to identify the respondents but the following step was undertaken to maintain respondent confidentiality, then anonymity and finally, research integrity. Once the clinical data had been collected the identifying numbers were physically removed from the consent forms, thus ensuring participant anonymity.

3.10.9 Potential Participant Follow-Up Process

Any woman who had not returned the BBEQ by three weeks after mail-out of the research pack was sent a reminder postcard (Appendix IX) by the researcher, informing them that there remained time to participate if they wished.

3.10.10 Participant Right to Opt Out of the Study

There were several points in the process at which women could opt out of the study. Firstly women could decline to return the initial invitation for further information and

not respond to the follow-up reminder postcard. Secondly they could refrain from completing the consent form and the BBEQ and ignore the reminder postcard. Thirdly women could complete the BBEQ but not give consent for their hospital record to be reviewed. Fourthly women could contact the researcher and ask for their BBEQ and clinical record review data to be withdrawn from the study. The research number tracking system in place initially enabled the researcher to do this. It would remain possible for data to be identified if requested by a participant; this would require the participant to provide personal details to allow identification following a hand search of the data sets. No woman has made this request. Women were able to request the results of the study by ticking the box on the consent form and almost all of the respondents did this.

3.11 The Clinical Data Collection Process

The HBDHB Maternity Service manager facilitated retrieval of the respondents' maternity clinical records from a list of participants drawn up by the researcher from the signed consent forms. The researcher then undertook the clinical data collection. The researcher examined each consenting participant's clinical record and identified the clinical data to be collected. A research assistant, who had signed a confidentiality agreement, recorded the data on the sequentially numbered clinical record data collection tool in the appropriate column. When there was an information gap this was recorded. Data was incomplete in some maternity records and one respondent did not give consent for her clinical records to be viewed.

3.12 Managing the Completed Questionnaires and Consent Forms

The completed consent forms and BBEQs were collated in separate files in numerical order. The research assistant, who had signed the confidentiality agreement, mainly completed the data entry with supervision by the researcher.

3.13 Data Analysis

3.13.1 Method of Data Analysis

Data was entered into the Statistical Package for the Social Sciences (SPSS for Windows, Rel. 11.5, 2003). The demographic data was analysed using descriptive statistics; for example frequencies (Gillis & Jackson, 2002). All the variables under consideration were analysed with type of birth and breastfeeding at four months postpartum using cross-tabulations with nonparametric Pearson's Chi-Square (? ^{2}) goodness of fit test as the measure of statistical significance of the proportion of cases that fell into the different categories: that is the differences between the two sub-samples and the variables under consideration. Fisher's Exact Test was used to test significance when more than 20% had expectant frequencies of less than 5, n = less than 30, or a table contained cells = 0 (Polit & Beck, 2004; SPSS for Windows, Rel, 11.5, 2003). As a clear prediction of the direction of the relationship between type of birth, the event under analysis and breastfeeding at four months postpartum could be made a one-tailed test was used. That is, I believed that women who had a caesarean section would not breastfeed as long as those who had a normal birth. In this study 0.05 has been designated as the level of significance for all tests. Multiple response questions were analysed by type of birth only. Frequencies and percentages between the category

under consideration and type of birth are reported. A number of variables were assessed with type of birth only and the results of interest are reported with the assessment of breastfeeding at four months postpartum. Other variables were assessed in various combinations to a limited extent and those that are of interest, or significance, are reported where appropriate in Chapter Five.

Some respondents' verbatim comments are used to illustrate issues related to the study's findings and support the studies findings. The qualitative data is being examined for themes using qualitative methodology as a separate part of the study.

3.14 Validity and Reliability of the BBEQ

3.14.1 Internal Validity

Internal validity is "the extent to which a question or variable accurately reflects the concept the researcher is actually looking for" (Davidson & Tolich, 1999, p. 32) and was important in this study. As the BBEQ was a new instrument it was important to ensure that it tested the concepts it attempted to measure. The BBEQ was assessed in the following manner. Eight International Board Certified Lactation Consultants critiqued the BBEQ. A further six health professionals including two Maori Health Providers and a Pacific Island Peoples Health Provider reviewed the BBEQ. Knapp (1998) and Riordan, Woodley and Heaton (1994) consider this to be an acceptable number of assessors. The BBEQ was adapted after this process. Changes were made to wording to simplify and clarify terms used. The order of some of the questions and their selected responses were changed.

The structure of the BBEQ allowed overall consistency of data collection, as well as consistency between the sub-samples of women. Multigravidae women in both sub-samples provided similar amounts of narrative data concerning previous breastfeeding experience. However the caesarean section sub-sample of women consistently provided more narrative or qualitative data concerning birth and early feeding experiences. There was also consistency between both sub-samples in providing narrative data comments concerning breastfeeding issues following early experiences and breastfeeding problems. There was evidence that many of the respondents would have liked more space on the BBEQ to provide narratives. Women wrote in the margins, on the back of the pages or provided stories on a variety of attached pages. Three women completed the BBEQ for two of their births and this suggests that the BBEQ was interesting, easy to complete, and reinforced the researcher's perception that many of the respondents had a desire to relate their experiences.

Validity can also vary across situations and populations (Minichiello et al., 1999). As the current study elicited large amounts of data from the respondents, and from births over three years and three months, the research was further exposed to a number of other threats related to internal validity, which limit the study and are discussed in Chapter Seven.

3.14.2 External Validity

External validity refers to the generalisability of the research findings to other settings or samples (Davidson & Tolich, 1999). While this study investigates an area that has been well researched internationally (Chapman & Pérez-Escamilla, 1999b; Churchill, 1997; Janke, 1988; Kearney et al., 1990; Mathur et al., 1993; Pérez-Escamilla et al.,

1996) there was no related research located in New Zealand. The responding population is described in Chapter Four in terms of its demographic characteristics, which are compared with those women birthing in New Zealand and when possible with those birthing in the Hawke's Bay region.

3.14.3 Reliability and Stability of the BBEQ

The reliability of an instrument is "the consistency with which it measures something" (Riordan et al, 1994, p. 32). Stability and consistency are measures of reliability and measure the degree to which the instrument obtains the same results on repeated applications. A further measure of reliability is internal consistency (Davidson & Tolich, 1999; Riordan et al., 1994). The reliability of the BBEQ was assessed and refined using a test-retest trial. Stability was also assessed in the test-retest trial.

Twenty BBEQs were anonymously completed twice over a week by a sample of potential responders. The scores on the repeated tests were compared with the mean response rate: similarity of the two completions being 95%. The BBEQ thus had a Cronbach's alpha coefficient of 0.95 indicating internal consistency, or that the items in the BBEQ measured the same concepts to a high extent (Beanland, Schneider, LoBiondo-Wood & Haber, 1999).

3.15 Effectiveness of the BBEQ

The BBEQ did what it was designed to do, which was to gather data about women's birth experiences and events and their influence on breastfeeding. The respondents completed the BBEQ as they were asked. That is, the tick boxes were checked

appropriately with no evidence of confusion. There were occasions when women did not complete a specific question and some of then gave an explanation for this. The consistency and number of comments and narratives further indicated that women were interested in completing the BBEQ. The BBEQ appeared to collect data accurately and be easy to complete. It was also possible to verify some of the data provided during the clinical data collection process.

3.16 Effectiveness of the Clinical Data Collection Tool

The clinical data collection tool did what it was designed to do which was to collect large amounts of data and allow that data to be added to that from the respondent's BBEQ. It was easy to use and was easy to adapt when it became apparent that one further column to expand information being collected would allow clarity. The clinical data collection tool will be able to be used again, or modified for use for research with different objectives.

3.17 Response to the Research Process

The study response rate and demographic make up of the study are discussed in detail in Chapter Four. The study generated almost a 34% show of interest. The final return rate of the BBEQ (32%) is considered reasonable (Bailey, 1997), particularly as there was a two-step process. A small number of respondents were included in the sample who did not entirely meet the eligibility criteria and the reasons for this are discussed in the study limitations section (Chapter Seven, p. 146). Almost all of the respondents provided comment in the space allocated for this task, whilst some women's stories spilled over to additional pages in various ways.

The majority of the BBEQs were returned within a three-week period following the initial mail-out. It is difficult to ascertain the impact of the reminder postcards sent out three to four weeks following the research pack mail-out as BBEQs were still being returned three months following the posting of the research pack. Two women chose to wait until their baby was four months postpartum old before to completing the BBEQ.

3.18 Summary

This chapter has described the methodology and design of the study, and process used for the data collection. The instruments of data collection were the BBEQ and the clinical data collection tool, and both have been described. The sampling plan and frame, processes of recruitment of the participants into the study and data collection have been described. The ethical issues that were relevant to the study have also been examined. Discussion of the data analysis intentions has occurred and finally the effectiveness of the BBEQ and data collection tool has been considered.

The following chapter presents the overall sample makeup including the demographic characteristics of the respondents and the characteristics of the babies in the study.

CHAPTER FOUR: PRESENTATION OF RECRUITMENT AND DEMOGRAPHIC RESULTS

4.1 Introduction

The purpose of the next two chapters is to present the results of the study. This chapter outlines the recruitment process and sample statistics. The next chapter presents the results, which address the primary aims of the study.

In this chapter the statistical details of the recruitment process are reported, including information concerning distribution and return of the completed questionnaires and consent forms, the total number of participants, the make-up of the two sub-samples and the demographics of the study sub-samples and finally the characteristics of the babies.

4.2 Response to Participant Selection Process

Table 1 displays the response details of the study recruitment process.

Table 1
Response to participant selection process

	Type of birth					
	NB		LSCS		Total	
	n	%	n	%	N	% of mail out by row
Letters of invitation	250	50	250	50	500	100
Returned address not known	33	13.2	29	11.6	62	12.4
Reposted letters of invitation	33	13.2	29	11.6	62	12.4
Interested in further information	Not known		Not known		169	33.8
Number of questionnaires returned	72	28.8	88	35.2	160	32.0
Sub-total (number of questionnaires returned)	**72**	**28.8**	**88**	**35.2**	**160**	**32.0**
Number of questionnaires excluded	4	1.6	3	1.2	7	1.4
Total sample	**68**	**27.2**	**85**	**34.0**	**153**	**30.6**

As Table one depicts two hundred and fifty women from each sub-sample received an invitation to participate in the study. One hundred and sixty nine women responded to the letter of invitation and were sent a research pack, which is described on page 50. No tracking system was in place to identify which sub-sample these responses came from. One hundred and sixty completed questionnaires were returned. This was a return rate of thirty two percent. One hundred and fifty three of the questionnaires were completed in sufficient detail and were from respondents who met the study entry criteria and were included in the study. The final study sample comprised sixty-eight women who had a normal vaginal birth and eighty-five who had a caesarean section. One respondent declined access to her clinical records and the researcher considered her questionnaire data set to be complete for analysis purposes, with the clinical record review data being managed as missing data.

Seven data sets were excluded from the analysis because one baby was formula fed from birth; three babies were less than four months old at the time of questionnaire completion and two babies had been in a special care baby nursery. Three respondents were re-sent a consent form with an invitation to complete it because they had omitted to return the original one. This was done on the assumption that by completing the questionnaire the respondent wished to be part of the study and a signed consent form was required before the woman could be included in the study. One participant's consent form was not returned and her data was therefore excluded from the study. The final participant number included three respondents who completed questionnaires for two different births; all met the study entry criteria and study time period and therefore were included in the study.

The denominator of the total sample is 153 (N = 153). Where the results of the total population are reported, the term total sample will be used. The denominator of the normal birth sub-sample is 68 (n = 68) and the denominator of the caesarean section sub-sample is 85 (n = 85). Where the results of the normal birth women are reported the term NB sub-sample is used and where the results of the caesarean section women are reported the term LSCS sub-sample is used.

4.3 Demographic Information

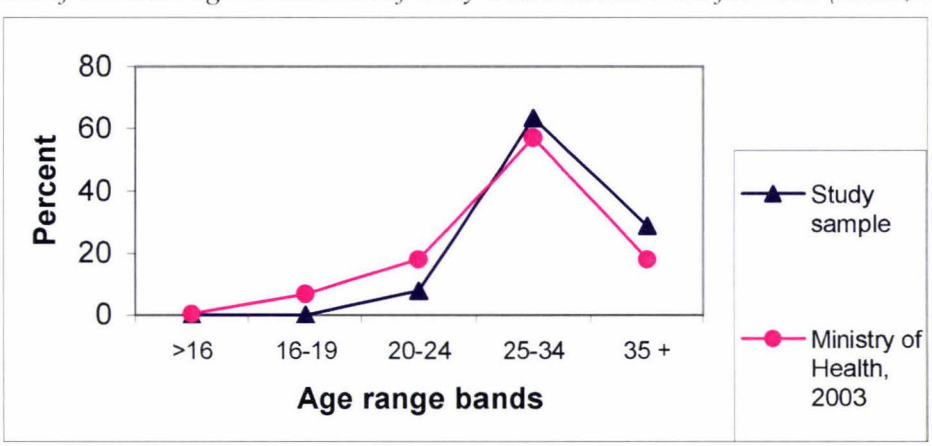
The Report on Maternity, 2000 & 2001 (Ministry of Health, 2003) presents national maternity data collected in 2000 and 2001, some of which is used as comparison benchmark data in this study. The year 2001, as the most recent for which national and regional data is available, has been selected as the comparative year for this study. Data from the National Census 2001 (Statistics New Zealand, 2002a & b) was used to provide benchmarking statistics for comparison of the study sample with national or regional figures in the areas of occupation and education.

4.3.1 Maternal Age

The participants recorded their age within a band range and the age range of the women who participated in this study was 20-49 years. The median age range in this study was 25-34 years, which reflects the national trend for women to give birth at a later age. Figure 1 displays the comparison of the current study maternal age with the Report on Maternity, 2000 & 2001 (Ministry of Health, 2003). The age bands in this study were comparable with those of the Ministry of Health (2003) with the exception of the bands between 25-29 and 30-34, which in this study, were collected in one band of 25-34

years. The decision to collect age range data was an arbitrary one and it would have been useful if this study had matched the Ministry of Health age bands, which would have allowed a more accurate comparison to occur. The national data bands of 25-29 and 30-34 were collapsed into one band, as were the 35-39 and 40+ bands, which allowed some comparison with this study. Although the study sample was drawn from three years and three months the national and regional statistics are from the 2001 data (Ministry of Health, 2003) providing limited comparison.

Figure 1
Comparison of maternal age distribution of study with National Data for 2001 (MOH, 2003).



4.3.2 Ethnicity

The distribution of ethnicity in the sample does not reflect the national population of birthing women, or the population of women who gave birth in the HBDHB area (Ministry of Health, 2003). All women in the current study answered the ethnicity question with 82% identifying as European. Where women had checked multiple ethnicities, their ethnicity was prioritised to enable comparison with the national 2001 ethnicity data provided by the Ministry of Health (2003, p. 132). The Ministry of Health (2003, p. 132) uses New Zealand Health Information Service standard

prioritisation of ethnicity. When women identified as New Zealand Maori and European, priority was given to Maori and analysed as such.

Table 2 displays the study's ethnicity mix and gives a comparison with relevant regional and national data. The study sample did not represent the ethnic make up of the Hawke's Bay region in 2001. It was under-representative for New Zealand Maori, Pacific Island and Asian women and over-representative for New Zealand European women and other ethnicities.

Table 2
Ethnicity of current study sample and comparison Report on Maternity 2001: National and Regional Data, (MOH, 2003).

Ethnicity	Current study %	All NZ Women 2001 %	Hawke's Bay 2001 %
NZ Maori	13.1	19.6	37.1
NZ European	81.6	58.1	54.3
Pacific Island Women	2.0	10.4	5.1
Asian	0.7	6.5	2.1
Other	2.6	3.8	1.2
Not known	0	1.6	0.2
Total	**100**	**100**	**100**

4.3.3 Occupation

The New Zealand Standard Classification of Occupation (Statistics New Zealand, 1999) was used in this study. Women were asked to state their occupation. The researcher coded the woman's occupation into the most appropriate one from the New Zealand Classification of Occupation list.

Table 3 shows the occupation make-up of the sample, by total sample and birth type, and provides some comparison with the national census 2001 (Statistics New Zealand, 2002a). Sixty one percent of the respondents in this study identified as full time

mothers and 1.3% identified as students, which the New Zealand Standard Classification of Occupation (Statistics New Zealand, 1999) identifies as "responses being outside the scope of classification". A further 28.7% were coded into samples that require a high degree of education, namely legislator/administrator, professionals, or technician/associate professionals. With the exception of the "professionals sample" there was little matching of the other occupational samples reported in the study sample and those reported in the National Census (Statistics New Zealand, 2002a).

Table 3
Occupation: comparison of study sample with Census, 2001: National Data (Statistics New Zealand, 2002a).

	Type of Birth						*National Census (2001)*
	NB		LSCS		Total		
Occupation	n	%	n	%	N	%	%
Legislator/administrator	2	2.9	2	2.4	4	2.6	10.3
Professional	11	16.2	16	18.7	27	17.5	16.8
Technician/associate professionals	5	7.4	8	9.4	13	8.5	12.9
Clerks	1	1.5	6	7.1	7	4.6	21.1
Service & Sales Workers	1	1.5	0	0	1	0.7	20.5
Agriculture and Fishery Workers	0	0	0	0	0	0	4.9
Trade workers	2	2.9	0	0	2	1.3	1.1
Plant & Machine operators & Assemblers	0	0	0	0	0	0	3.6
Elementary Workers (including residentials)	3	4.4	0	0	3	2.0	4.8
Not elsewhere included	0	0	0	0	0	0	4.2
Mothers	42	61.7	52	61.2	94	61.5	0
Students	1	1.5	1	1.2	2	1.3	0
Total	**68**	**100**	**85**	**100**	**153**	**100**	**100**

4.3.4 Education Levels

Educational levels of the respondents in the study are compared with the regional figures from the National Census 2001 in Table 4. A small percentage (8.7%) of the

respondents in the study reported no formal education with a higher percentage being from the NB sub-sample (11.9%) than the LSCS sub-sample (6%). The regional summary gives a higher percentage (28.1%) for women reporting no formal education. The study sample had similar percentages of respondents in both sub-samples who had a high school qualification (30.7%) as the national percentage (33%). There were slightly more respondents in the LSCS sub-sample, and slightly less in the NB sub-sample, who had higher education to certificate or diploma level. There were similar percentages of respondents in both sub-samples the study having an education to university degree level as in the region. There were also small differences in the percentages between the sample samples except for the sample with no formal education as discussed. Table 4 gives the sub and total sample and regional figures for education levels.

Table 4
Educational levels of the study sample compared with regional Census 2001: Regional Data (Statistics New Zealand, 2002b)

	Type of birth						Regional Summary
	NB		LSCS		Total		
Highest Qualification	n	%	n	%	N	%	%
No formal education	8	11.9	5	6.0	13	8.7	28.1
High school qualification	22	32.8	24	28.9	46	30.7	33.0
Certificate or diploma	20	29.9	34	41.8	54	36.0	17.5
University degree	17	25.4	20	24.1	37	24.7	5.6
Study Total	**67**	**100**	**83**	**100**	**153**	**100**	**100**

Missing data – three respondents

4.4 Pregnancy and Birth Statistics

4.4.1 Parity

The parity of the women in the sample is shown in Table 5. The overall parity of the sample was similar to the national percentages shown in the Report on Maternity, 2001

(Ministry of Health, 2003). The sub-samples are unequal for parity with 14.7% of the NB sub-sample being primiparous women compared with 43.5% of the LSCS sub-sample.

Table 5
Comparison of parity of the study sample with the Report on Maternity 200: National Data (MOH, 2003)

	Type of Birth						National 2001
	NB		LSCS		Total		
	n	%	n	%	N	%	%
Primiparity	10	14.7	37	43.5	47	30.7	37.4
Multiparity	58	85.3	48	56.5	106	69.3	62.6
Total	**68**	**100**	**85**	**100**	**153**	**100**	**100**

Table 6 shows the break down comparison of parity between the total sample, type of birth, and the 2001 Ministry of Health (2003) figures. As stated above the study contains marginally less primiparous women, significantly more women having their second baby, an almost identical percentage of women having their third baby and less women than the national percentage having their fourth birth. The current study sample contains more women having five births than the national percentages. The study sample was drawn from a three years three month time period and this limits the relevance of the comparison between parity in the study and the national figures.

Table 6
Comparison of number of births in study and Report on Maternity 2001, National Data (MOH, 2003).

	Type of birth						National 2001
	NB		LSCS		Total		
Birth number	N	%	n	%	N	%	%
1	10	14.7	37	43.5	47	30.7	37.4
2	31	45.6	32	37.6	63	41.2	31.9
3	17	25.0	11	12.9	28	18.3	16.6
4	4	5.9	3	3.5	7	4.6	7.4
5	6	8.8	2	2.4	8	5.2	3.5
6 - 12	0	0	0	0	0	0	3.2
Total	**68**	**100**	**85**	**100**	**153**	**100**	**100**

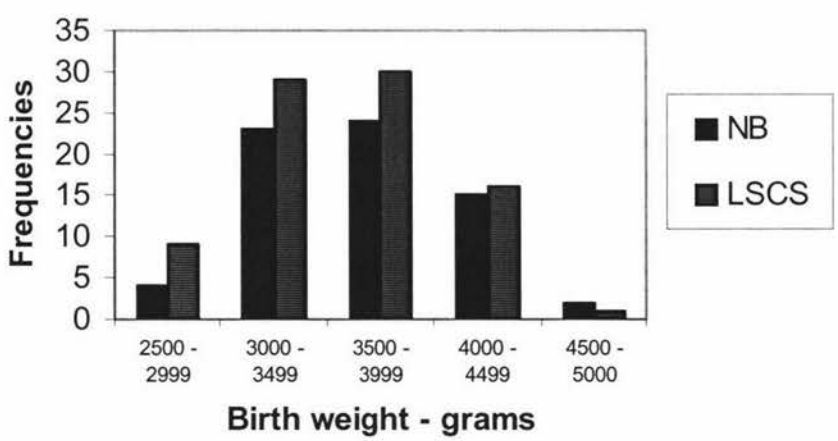
4.5 Sample Characteristics of the Babies in the Study

4.5.1 Weight of Babies

The majority of the babies in both sub-samples weighed between 3000 and 3999 grams. The next most common weight range for the babies in the study was 4000-4499 grams. There were fewer babies in both the lower birth weight range (2500-2999 grams) and the higher birth weight range (4500-5000 grams) as Figure 2 shows.

The weights of the babies' in the study cannot be compared with national or regional figures because the weight ranges of 2500 – 4499 grams were combined into one category in the Ministry of Health (2003) document, which in 2001, in the Hawke's Bay region, was 90.1% of the total babies. This study had two percent of babies weighing 4500 or more grams: the same percentage as babies of the same weight range born in 2001 in the HBDHB region (Ministry of Health, 2003).

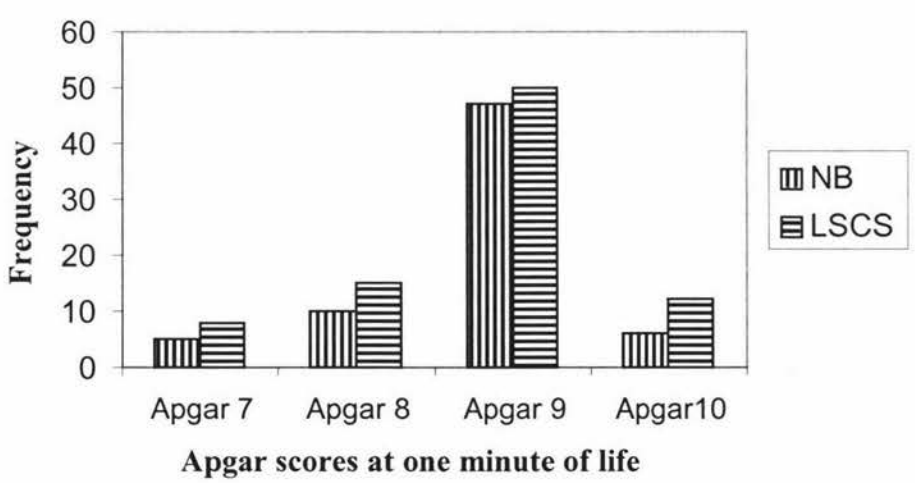
Figure 2
Total sample baby weight distribution



4.5.2 Apgar Scores of Babies

Figure 3 displays the babies Apgar scores at one minute of age in both the NB and LSCS sub-samples. Sixty-three point three percent of these babies had an Apgar score of nine, almost equally distributed between the two samples. The remainder of the babies, in both sub-samples, were evenly distributed between the other three Apgar scores. The Apgar scores in the Report on Maternity 2000 & 2001 (Ministry of Health, 2003) reports Apgar scores in ranges of 1-4, 5-8 and 9-10. This means that comparison with the national Apgar scores is not possible. There was an assumption in the current study, consistent with interpretation of Apgar scores in practice, that an Apgar of seven or over at one minute meant that the baby had no detrimental respiratory or other physical issues, and therefore an Apgar score of less than seven at one minute was an exclusion criterion for this study.

Figure 3
Comparison of baby Apgar score distribution



4.6 Summary

The definitions used to differentiate between the total sample, NB sub-sample and the LSCS sub-samples have been presented in this chapter. This chapter has also provided details of the sample size and the make up of the two sub-samples. The demographic makeup of the total sample and sub-samples has been discussed and where possible compared with national and regional maternity figures and other national demographic statistics. The women in the total sample were generally older on average than the national birthing population, overwhelmingly of New Zealand/European descent and as such did not reflect either the New Zealand, or Hawke's Bay region ethnicity for birthing populations (Ministry of Health, 2003). The occupation of the women reflected the national census occupational category for professional women but the majority of the women in the study sample overwhelmingly considered their occupation to be that of full time mother. The study also had a small percentage of women who identified as students. Almost 61% of the respondents had a certificate or diploma, or university degree and this was considerably more than the overall regional percentages for these two educational categories. The current study's overall primiparous and multiparous respondent percentages are similar to those reported in the 2001 Report on Maternity (Ministry of Health, 2003). There were more mothers having their second and fifth baby and fewer mothers who had a fourth baby in the current study than the national population. There were no mothers in the study who had more than five babies. The weight and Apgar scores of the babies in the sample have been shown.

The following chapter presents the results from the questionnaires and the clinical record review. The results of the analysis of the three aims of the study related to events and experiences of the two sub-samples and breastfeeding at four months postpartum

are presented. The results are presented in sections to aid clarity. Comparative results of findings of significance are presented alongside the other results of the event or experience under consideration. Finally the results of some general matters of interest concerning breastfeeding in the current study are presented.

CHAPTER FIVE: RESULTS – BIRTH AND BREASTFEEDING EVENTS AND EXPERIENCES

5.1 Introduction

In this chapter, the results of the nonparametric statistical tests, cross-tabulated by the dependent variables; breastfeeding duration, and the event or experience of the respondents, and the independent variable; type of birth are reported. Significant statistical relationships between an event or experience (dependent variable), and type of birth (independent variable) are also reported alongside the analysis of the variables, type of birth and breastfeeding at four months postpartum. Multi response questions test results also presented, as are a small number of other Chi-square goodness of fit test results of interest.

Unless otherwise stated, breastfeeding at four months postpartum is any breastfeeding, as opposed to breastfeeding status (see p. 11 for definitions). The results in the tables are presented as the number of the participants in the sub-samples and the total sample. The percentages presented are for type of birth unless otherwise stated. The results of the multi-response questions are presented as the number in each sub-sample and the sample total with percentages. Operational definitions have been provided in Chapter One, page 10.

The results of the first two questions are presented together, these were:

- How many of the respondents were breastfeeding four months after the birth of their baby?

Errata: a conversion error has occurred in Chapter 5, pages 72 – 107.
Please read $?^2$ as χ^2

- Do women having a caesarean section have a different duration of breastfeeding compared to women having a normal vaginal birth?

5.2 Breastfeeding at Four Months Postpartum and Type of Birth

As reported in Chapter Four, the total sample of 153 respondents consisted of 68 women in the NB sub-sample and 85 women in the LSCS sub-sample. Table seven shows that the majority of the total sample was breastfeeding at four months postpartum. The percentage of respondents in both sub-samples breastfeeding at four months postpartum was similar. There was no significant statistical relationship between breastfeeding at four months postpartum and type of birth.

Table 7
Comparison of type of birth and all breastfeeding at four months postpartum

	Type of birth					
	NB		LSCS		Total	
Breastfeeding at 4 months	n	% of birth type	n	% of birth type	N	% of birth type
Yes	59	86.8	75	88.2	134	87.6
No	9	13.2	10	11.7	19	12.4
Total	**68**	**100**	**85**	**100**	**153**	**100**

$?^2 = .075$, df 1, p .075.

5.3 Breastfeeding Status at Four Months Postpartum

The respondents who were breastfeeding at four months postpartum were asked to describe their breastfeeding status from five options (Appendix I, question 27). The last three options were collapsed into a single category of partial breastfeeding for analysis. Table eight depicts breastfeeding status of the total and sub-samples in the study. There was no significant statistical relationship between breastfeeding status at four months postpartum and type of birth.

Table 8
Comparison of type of birth and status of breastfeeding at four months postpartum

Status of breastfeeding at 4 months postpartum	Type of birth					
	NB		LSCS		Total	
	n	% of birth type	n	% of birth type	N	% of birth type
Exclusive breastfeeding	48	70.6	50	58.8	98	64.1
Full breastfeeding	6	8.8	12	14.1	18	11.8
Partial breastfeeding	5	7.4	13	15.3	18	11.8
Formula feeding	9	13.2	10	11.8	19	12.3
Total	**68**	**100**	**85**	**100**	**153**	**100**

$?^2 = 3.807$, $df\,3$, p .283.

The results of the third question of the study are presented next. This was:

- What was the relationship, if any, between the birth and breastfeeding events, for women who had a caesarean section compared to women who had a normal vaginal birth?

The results in this section are presented in sub-sections to provide clarity. They are: prior breastfeeding experience and intentions, birth events, immediate postnatal events, the impact of subsequent postpartum events, and finally the breastfeeding cessation and the cessation rates of the respondents.

5.4 Breastfeeding: The Influence of Prior Experiences and Intentions

This section reports events and experiences identified in the literature review as influencing breastfeeding duration. The events reported here are: parity, prior breastfeeding experience, obtaining breastfeeding knowledge, feeding intention and intention to return to work. Where appropriate these events and experiences were also analysed with type of birth, or breastfeeding at four months postpartum, and the results of interest are reported.

5.4.1 Comparison of Breastfeeding at Four Months Postpartum, Type of Birth, and Parity

The respondents were asked, "how many babies have you given birth to?" Parity was collapsed into two categories for analysis (first birth and subsequent births), because as parity increased there were fewer respondents in each category. The overall results of the parity of the respondents in the study were presented in Chapter Four, page 67.

Almost a third of the total sample (N = 47) was having their first baby. There was no significant statistical relationship between breastfeeding at four months postpartum, type of birth and parity. Tables nine a & b show the test results.

Table 9 a
Comparison of breastfeeding at four months postpartum, type of birth and primiparity

		Type of birth					
Primiparity		NB		LSCS		Total	
	Breastfeeding At 4 months	n	% of birth type	n	% of birth type	N	% of birth type
	Yes	9	90	29	78.4	38	80.9
	No	1	10	8	21.6	9	19.1
Total		**10**	**100**	**37**	**100**	**47**	**100**

p .375, *df* 1, Fisher's Exact Test.

Table 9 b
Comparison of breastfeeding at four months postpartum, type of birth and multiparity

		Type of birth					
Multiparity		NB		LSCS		Total	
	Breastfeeding at 4 months	N	% of birth type	n	% of birth type	N	% of birth type
	Yes	50	86.2	46	95.8	96	80.9
	No	8	13.8	2	4.2	10	19.1
Total		**58**	**100**	**48**	**100**	**106**	**100**

p .086, *df* 1, Fisher's Exact Test.

There was no significant statistical relationship between primiparity and multiparity, and breastfeeding at four months postpartum ($?^2 = 2.826$, *df* 1, *p* .093).

5.4.2 Comparison of Breastfeeding at Four Months Postpartum, Type of Birth and Prior Breastfeeding Experience

Respondents were asked if they had breastfed before. Just under two thirds (N = 98) of the total sample had prior breastfeeding experience. A slightly higher percentage of the NB than the LSCS sub-sample with prior breastfeeding experience was breastfeeding at four months postpartum. The majority of the respondents, who had not breastfed before, in both sub-samples, were also breastfeeding at four months postpartum. There was a marginally significant relationship between breastfeeding at four months postpartum, type of birth, and prior breastfeeding experience. Tables 10 a & b depict the test results.

Table 10 a
Breastfeeding at four months postpartum, type of birth and breastfed before

	Type of birth					
Breastfed before	NB		LSCS		Total	
Breastfeeding at 4 months	n	% of birth type	n	% of birth type	N	% of birth type
Yes	49	86	40	97.6	89	90.8
No	8	14	1	2.4	9	9.2
Total	**57**	**100**	**41**	**100**	**98**	**100**

p .049*, *df* 1, Fisher's Exact Test.

Table 10 b
Breastfeeding at four months postpartum, type of birth and not breastfed before

	Type of birth					
Not breastfed before	NB		LSCS		Total	
Breastfeeding at 4 months	n	% of birth type	n	% of birth type	N	% of birth type
Yes	10	90.9	35	79.5	45	81.8
No	1	9.1	9	20.5	10	18.2
Total	**11**	**100**	**44**	**100**	**55**	**100**

p .351, *df* 1, Fisher's Exact Test.

It is reasonable to expect that women with increasing numbers of pregnancies would have breastfed before, and as a consequence, be more likely to be breastfeeding at four months postpartum. As anticipated multiparity and having breastfed before was highly significantly statistically related ($?^2 = 120.878$, *df* 1, $p < .0005$*). In this study, however, having breastfed before and breastfeeding at four months postpartum was not statistically significantly related (*p* .105, *df* = 1, $?^2 = 2.623$).

5.4.3 Comparison of How the Respondent Learnt About Breastfeeding

The respondents were asked to how they learnt about breastfeeding in a multi-response question. Each respondent selected on average 2.2 categories: overall there was fairly equal spread between the sub-samples. The respondents identified the most common source of information as a midwife, then prior breastfeeding experience, closely followed by antenatal/parenting classes. Family, or *whanau*, were the next most important people for providing breastfeeding knowledge and lastly was 'other' education. In the category of 'other' education the respondents reported that they gained breastfeeding education from a variety of areas including: healthcare professionals, various types of published material, and life experiences. The results are shown in Table 11.

Table 11
How the respondents learnt about breastfeeding

	Type of birth					
	NB		LSCS		Total	
How the respondent learnt about breastfeeding	n	% of birth type	n	% of birth type	N	% of birth type
Midwife	43	25.7	47	28.0	90	26.9
Previous breastfeeding experience	44	26.3	31	18.5	75	22.4
Antenatal/parenting class	31	18.6	42	25.0	73	21.8
Family/*Whanau*	30	18.0	23	13.7	53	15.8
Other ways of learning	19	11.4	25	14.8	44	13.1
Total	**167**	**100**	**168**	**100**	**335**	**100**

5.4.4 Comparison of Breastfeeding at Four Months Postpartum, Type of Birth and Intended Length of Breastfeeding

Respondents were asked to identify how long they intended to breastfeed in a question with predetermined categories. The respondent in the LSCS sub-sample who said she planned to breastfeed for less than one month, and the two in the NB sub-sample who said they planned to breastfeed less than three months, were not breastfeeding at four months postpartum. Tables 12 a, b & c show the test results. No significant statistical relationship was found between breastfeeding at four months postpartum, type of birth and intended duration of breastfeeding.

Table 12 a
Comparison of breastfeeding at four months postpartum, type of birth and intended duration of breastfeeding 3 – 6 months

		Type of birth				
Breastfeeding intention 3 - 6 months		NB		LSCS		Total
	Breastfeeding at 4 months	n	% of birth type	n	% of birth type	N	% of birth type
	Yes	8	80	10	71.4	18	75
	No	2	20	4	28.6	6	25
Total		**10**	**100**	**14**	**100**	**24**	**100**

p .506, df 1, Fisher's Exact Test.

Table 12 b
Comparison of breastfeeding at four months postpartum, type of birth and intended duration of breastfeeding greater than 6 months

Breastfeeding intention > 6 months	Type of birth					
	NB		LSCS		Total	
Breastfeeding at 4 months	n	% of birth type	n	% of birth type	N	% of birth type
Yes	43	93.5	56	93.3	99	93.4
No	3	6.5	4	6.7	7	6.6
Total	**46**	**100**	**60**	**100**	**106**	**100**

P .646, *df* 1, Fisher's Exact Test.

Table 12 c
Comparison of breastfeeding at four months postpartum, type of birth and intended duration of breastfeeding – not sure

Breastfeeding intention - not sure	Type of birth					
	NB		LSCS		Total	
Breastfeeding at 4 months	n	% of birth type	n	% of birth type	N	% of birth type
Yes	8	80	9	90	17	85
No	2	20	1	10	3	15
Total	**10**	**100**	**10**	**100**	**20**	**100**

p .500, *df* 1, Fisher's Exact Test.

5.4.5 Comparison of Breastfeeding at Four Months Postpartum, Type of Birth and Feeding Intention

The respondents were asked, "How did you plan to feed your baby?" using a question with four predetermined responses (see Appendix I). Almost ninety-two percent (91.5%) of the total sample intended to fully breastfeed. The majority of the respondents who either intended to fully breastfeed or combination feed were breastfeeding at four months postpartum. The one respondent in the LSCS sub-sample who planned to formula feed and the two from the same sub-sample who were not sure how they intended to feed were breastfeeding at four months postpartum. There was no

significant statistical relationship between breastfeeding at four months postpartum, type of birth, and intended feeding status. Tables 13 a & b show the test results.

Table 13 a
Breastfeeding at four months postpartum, type of birth and intended to fully breastfeed

		Type of birth					
Intended to fully breastfeed		NB		LSCS		Total	
	Breastfeeding at 4 months	n	% of birth type	n	% of birth type	N	% of birth type
	Yes	55	87.3	68	88.3	123	87.9
	No	8	12.7	9	11.7	17	12.1
Total		**63**	**100**	**77**	**100**	**140**	**100**

?^{2}. = .033, *df* 1. *p* .528.

Table 13 b
Breastfeeding at four months postpartum, type of birth and intended to combination feed

	Type of birth					
Intended to combination feed	NB		LSCS		Total	
Breastfeeding at 4 months	n	% of birth type	n	% of birth type	N	% of birth type
Yes	4	80	4	80	8	80
No	1	20	1	20	2	20
Total	**5**	**100**	**5**	**100**	**10**	**100**

p .778, *df* 1, Fisher's exact test.

5.4.6 Comparison of Breastfeeding at Four Months Postpartum, Type of Birth and Intention to Return to Work

A third (n = 50) of the total sample intended to return to work following the birth of their baby: 58% of the LSCS sub-sample and 42% of the NB sub-sample. There was no significant statistical relationship between breastfeeding at four months postpartum, type of birth and intention to return to work. Tables 14 a & b depicts the test results.

Table 14 a
Breastfeeding at four months postpartum, type of birth and intention to return to work

	Type of birth					
Intended to return to work - yes	NB		LSCS		Total	
Breastfeed at 4 months	n	% of birth type	n	% of birth type	N	% of birth type
Yes	15	71.4	26	89.7	41	82
No	6	28.6	3	10.3	9	18
Total	**21**	**100**	**29**	**100**	**50**	**100**

p .100, *d* 1, Fisher's Exact Test.

Table 14 b
Breastfeeding at four months postpartum, type of birth and no intention to return to work

	Type of birth					
Did not Intend to return to work	NB		LSCS		Total	
Breastfeed at 4 months	n	% of birth type	n	% of birth type	N	% of birth type
Yes	44	93.6	49	87.5	93	90.3
No	3	6.4	7	12.5	10	9.7
Total	**47**	**100**	**56**	**100**	**103**	**100**

p .241, *df* 1, Fisher's Exact Test.

The respondents intended to return to work following the birth of their baby, month by month, in small numbers, over the first six months. Just over eighteen percent (18.3%; n = 28) of the total sample had returned to work by six months postpartum; 35.7% (n = 10) were in the NB and 64.3% (n = 18) in the LSCS sub-sample. No significant statistical relationship was found between; intention to return to paid work and breastfeeding at four months postpartum ($?^2 = 2.128$, *df* 1, *p* .117).

5.5 Discussion

There was one significant statistical relationship found between breastfeeding at four months postpartum, type of birth and prior breastfeeding experience and intentions.

This was a marginal statistically significant association between breastfeeding at four months postpartum, type of birth and prior breastfeeding experience.

5.6 Breastfeeding: The Influence of Birth Events and Experiences

This section reports findings of events and experiences, identified in the literature review, having an influence on breastfeeding duration. The events reported here are: receiving narcotic analgesia in labour, labour, the length labour, receiving oxytocin in labour, type of anaesthetic administered for caesarean section, and type of caesarean section. Where appropriate these events and experiences were also analysed with type of birth, or breastfeeding at four months postpartum, and the results of interest are reported. Labour data for one respondent in the LSCS sub-sample was unavailable as she declined to have her clinical records examined.

5.6.1 Comparison of Respondents who Received Narcotic Analgesia in Labour

Just one respondent in each sub-sample was identified as having narcotic analgesia within two hours prior to birth: both were breastfeeding at four months postpartum. The small number of respondents meant no statistical information could be obtained.

5.6.2 Comparison of Breastfeeding at Four Months Postpartum, Type of Birth and Labour

The time women laboured was measured in, arbitrary, predetermined categories of less than four hours, four-to-12 hours and 12-to-24 hours. As expected, the entire NB sub-sample laboured. By comparison, 52.9% (n = 45) of the LSCS sub-sample laboured and

these women went on to have an unplanned caesarean section. No significant statistical relationship was found between breastfeeding at four months postpartum, type of birth and having laboured (Yes, $?^2$ = .004, *df* 1, *p* .948). No significant statistical relationships were found between breastfeeding at four months postpartum, type of birth and any of the length of labour categories. In addition no significant statistical relationship was found between having laboured and breastfeeding at four months postpartum ($?^2$ = 1.258, *df* 2, *p* .553).

5.6.3 Comparison of Breastfeeding at Four Months Postpartum, Type of Birth and Oxytocin in Labour

All the women having oxytocin in labour, except one, were in the LSCS sub-sample. Oxytocin administration included women having an induction of labour and/or labour augmented. The administration of oxytocin in the third stage of labour was not examined in the study, nor was there any attempt to identify the reason that a respondent had oxytocin in labour. The respondent who had oxytocin in labour in the NB sub-sample was included in the study, as there appeared to be no other exclusion factors present. She was breastfeeding at four months postpartum. Almost twenty-four percent (23.5%; n = 20) of the LSCS sub-sample had oxytocin in labour and 80% (n = 16) of these women were breastfeeding at four months postpartum. No significant statistical relationship was found between breastfeeding at four months postpartum, type of birth and having oxytocin in labour (Yes, *p* .810, *df* 1, Fisher's Exact Test). There was also no significant statistical relationship between breastfeeding at four months postpartum and having oxytocin in labour (*p* .271, *df* 1, Fisher's Exact Test).

5.6.4 Comparison of Breastfeeding at Four Months Postpartum and Anaesthetic for Caesarean Section

In this study the type of anaesthetic the respondent had was recorded as the anaesthetic at time of caesarean section. This included three respondents who had a general anaesthetic following either a spinal, or epidural, anaesthetic during labour. All five respondents who had a general anaesthetic were breastfeeding at four months postpartum. No significant statistical relationship was found between breastfeeding at four months postpartum, and type of anaesthetic. Table 15 shows the test results.

Table 15
Breastfeeding at four months postpartum and type of anaesthetic

	Type of anaesthetic for caesarean section							
	Epidural		Spinal		General		Total	
Breastfeed at 4 months	n	% of epidural	n	% of Spinal	n	% of general	N	% of type of anaesthetic
Yes	32	82.1	37	92.5	5	100	74	88.1
No	7	17.9	3	7.5	0	0	10	11.9
Total	**39**	**100**	**40**	**100**	**5**	**100**	**84**	**100**

$?^2 = 2.774$, df 2, p .250.

5.6.5 Comparison of Breastfeeding at Four Months Postpartum and Type of Caesarean Section

Planned caesarean section was identified during the clinical record examination as women who had a caesarean section on a prearranged date. All the women having a planned caesarean section were breastfeeding at four months postpartum compared with 84.1% of the unplanned caesarean section women. There was a marginally significant statistical relationship between type of caesarean section and breastfeeding at four months postpartum. Table 16 shows the test results.

Table 16
Breastfeeding at four months postpartum and type of caesarean section

	Type of caesarean section					
	Planned		Unplanned		Total	
Breastfeed at 4 months	n	% of birth type	n	% of birth type	N	%
Yes	21	100	53	84.1	75	88.1
No	0	0	10	15.9	10	11.9
Total	**21**	**100**	**63**	**100**	**84**	**100**

p .046*, *df* 2, Fishers Exact Test.

5.7 Discussion

No significant statistical relationships were found between breastfeeding at four months postpartum, type of birth and: narcotic analgesia in labour, having laboured, length of labour, oxytocin administration in labour, and type of anaesthetic. A marginally significant relationship was found between breastfeeding at four months postpartum and type of caesarean section.

5.8 Breastfeeding: The Influence of Immediate Postnatal Events and Experiences

The following section continues to address the study's third aim and reports events and experiences immediately following birth identified in the literature review as having an influence on breastfeeding duration. The events reported are: receiving narcotic analgesia within two hours of birth, time of first cuddle, concomitant skin-to-skin contact, time of first breastfeed, and how the baby fed the first time. Where appropriate these events and experiences were also analysed with type of birth, or breastfeeding at four months postpartum, and the results of interest are reported.

5.8.1 Comparison of Breastfeeding at Four Months Postpartum, and Narcotic Analgesia within Two Hours Following Birth

The administration of narcotic analgesia was determined during the clinical data collection process. The information concerning administration of narcotic analgesia could not be identified in seven of the respondents' clinical records. One respondent declined to have her clinical record examined.

Almost ninety-two percent (91.6%; n = 77) of the LSCS sub-sample was recorded as having narcotic analgesia within two hours following birth and 87% (n = 67) were breastfeeding at four months postpartum. All the respondents recorded as not having narcotic analgesia within two hours following surgery were breastfeeding at four months postpartum. The respondent in the NB sub-sample who had narcotic analgesia following birth was also breastfeeding at four months postpartum. No significant statistical relationship was found between breastfeeding at four months postpartum, type of birth and receiving narcotic analgesia following birth (Yes; p .872, df 1, Fisher's Exact Test).

5.8.2 Comparison of Breastfeeding at Four Months Postpartum, Type of Birth and Time Respondent First Cuddled Baby

To differentiate between the time of first touch or initial contact and a sustained length of intimate mother-baby contact (which the mother would identify as a "cuddle), the study asked the question "when did you first cuddle your baby?" There were five predetermined categories the respondents could select (see Appendix I). For analysis

the four time categories greater than one hour were collapsed into one category of greater than one hour, as the numbers were small in some of the categories.

Within the first hour following birth 84.7% (n = 128) the total sample had cuddled their baby. This was 98.5% (n = 67) of the NB sub-sample and 72% (n = 61) of the LSCS sub-sample. The respondent in the NB sub-sample who reported that she did not cuddle her baby within the first hour made no comment as to why this was. The respondent in the LSCS sub-sample who reported she did not cuddle her baby until it was over four hours old also made no comment as to why this was. The respondent in the LSCS sub-sample who reported she did not cuddle her baby for more than eight hours said that her husband held her baby to her breast for feeding and that 'she did not count this as a cuddle'. There was a highly significant statistical relationship between type of birth and time of first cuddle of the baby. Table 17 depicts the test results.

Table 17
Type of birth and time of first cuddle of baby

	Type of birth					
	NB		LSCS		Total	
Baby first Cuddle	n	% of birth type	n	% of birth type	N	% of birth type
< 1 hour	67	98.5	61	71.8	128	83.7
>1 hour	1	1.5	24	28.2	25	16.3
Total	**68**	**100**	**85**	100	**153**	**100**

$?^2 = 19.797$, $df\ 1$, $p < .0005$*.

No significant statistical relationship was found between breastfeeding at four months postpartum, type of birth, and time of first cuddle. Of those respondents who were able to cuddle their baby within the first hour, 86.6% (n = 58) of the NB sub-sample versus 91.8% (n = 56), of the LSCS sub-sample were breastfeeding at four months postpartum. The single respondent (100%) in the NB sub-sample and 95% (n = 19) of the LSCS

sub-sample, who cuddled their baby after the first hour were also breastfeeding at four months postpartum.

5.8.3 Comparison of Breastfeeding at Four Months Postpartum, Type of Birth and Concomitant Skin-to-Skin Contact with Baby

Just over a third of the total sample had concomitant skin-to-skin contact with their baby. The majority were in the NB sub-sample. There was a highly significant statistical relationship between type of birth and concomitant skin-to-skin contact. The test results are shown on Table 18.

Table 18
Type of birth and concomitant skin-to-skin contact with baby

	Type of birth					
	NB		LSCS		Total	
Held baby skin-to-skin	n	% of birth type	n	% of birth type	N	% of birth type
Yes	44	64.7	12	14.1	56	36.6
No	24	35.3	73	85.9	97	63.4
Total	**68**	**100**	**85**	**100**	**153**	**100**

$?^2 = 41.664$, df 1, $p<.0005$*.

All the respondents in the LSCS sub-sample who had concomitant skin-to-skin contact with their baby at birth were breastfeeding at four months postpartum compared with 81.8% (n = 36) of the NB sub-sample. Almost ninety-six percent (95.8%; n = 23) of the NB sub-sample compared with 86.3% (n = 63) of the LSCS sub-sample, who did not have concomitant skin-to-skin contact, were breastfeeding at four months postpartum. Breastfeeding at four months postpartum, type of birth, and concomitant skin-to-skin contact were not significantly associated (yes, p 125, df 1, Fishers Exact Test).

5.8.4 Comparison of Breastfeeding at Four Months Postpartum, Type of Birth and Time of First Breastfeed

The respondents were asked to identify the time of the first feed following birth in a question with predetermined responses as Table 19 depicts. Within the first hour, 66.6% (n = 102) of the total sample reported they had breastfed their baby; a higher percentage of these respondents were in the NB sub-sample. There was a highly significant statistical relationship between type of birth and the time of first feed. The test results are shown in Table 19.

Table 19
Type of birth and comparison of time of first breastfeed

	Type of birth					
	NB		LSCS		Total	
Time of first feed	N	% of birth type	N	% of birth type	N	% of birth type
Within 1 hour	56	82.4	46	54.1	102	66.6
1 - 2 hours	6	8.8	25	29.4	31	20.3
2 - 4 hours	6	8.8	14	16.5	20	13.1
Total	**68**	**100**	**85**	**100**	**153**	**100**

$?^2 = 14.111$, $df 2$, p .001*.

The relationship between breastfeeding at four months postpartum, type of birth and the time of the first feed was not statistically significant.

5.8.5 Comparison of Breastfeeding at Four Months Postpartum, Type of Birth and How Baby Fed the First Time

The respondents were asked to identify how their baby fed the first time in a question with predetermined categories. These were: fed well, sucked briefly, nuzzled/latched

but did not feed well, and didn't latch or feed. Two respondents did not answer this question.

Just over a third of the total sample (n = 57) reported that their baby had fed well. Of these, 89.5% (n = 51) were breastfeeding at four months postpartum: 37.2% (n = 19) of the NB sub-sample compared with 62.7% (n = 32) of the LSCS sub-sample. Nearly fifty percent (48%; n = 73) of the total sample reported their baby sucked briefly: 49.2% (n = 36) of the NB sub-sample compared with 50.8% (n = 37) of the LSCS sub-sample were breastfeeding at four months postpartum. Just over nine percent (9.2%; n = 14) of the total sample, reported their baby either nuzzled at the breast but did not feed: 46.2% (n = 6) in the NB sub-sample compared with 53.8% (n = 8) in the LSCS sub-sample were breastfeeding at four months postpartum. Of the total sample, 4.6% (n = 7) reported their baby did not latch or feed, and all but two of these respondents, both from the LSCS sub-sample, were breastfeeding at four months postpartum. No significant statistical relationships were found between breastfeeding at four months postpartum, type of birth and any of the categories of how the infant fed at the first feed.

There was no significant statistical relationship between type of birth and how the baby fed for the first time ($?^2 = 1.512$, *df* 3, *p* .679). There was also no significant statistical relationship between planned or unplanned caesarean, and how the baby fed for the first time ($?^2 = 5.825$, *df* 3, *p* .120).

5.9 Discussion

No significant statistical relationships were found between breastfeeding at four months postpartum, type of birth and: having a narcotic analgesia within two hours following

birth, time of first cuddle, concomitant skin-to-skin contact, time of first breastfeed, and how the baby fed the first time. There were highly significant statistical relationships between type of birth and: time of first cuddle, concomitant skin-to-skin contact, and time of first breastfeed.

5.10 Breastfeeding: The Influence of Subsequent Postpartum Events

The following section continues to address the study's third question and reports the test results of subsequent postnatal events and experiences identified in the literature review as having an influence on breastfeeding duration. The events reported are: frequency of infant feeding in the first two days, supplementary feeding in hospital, 'rooming in', time the mother's milk 'came in', breastfeeding support in hospital, who provided the help, breastfeeding problem in hospital, what the breastfeeding problem was, time the baby started to feed well, and finally when the respondent was discharged from hospital. Where appropriate these events and experiences were also analysed with type of birth, and breastfeeding at four months postpartum, and the test results of interest are reported.

5.10.1 Comparison of Breastfeeding at Four Months Postpartum, Type of Birth and Frequency of Infant Breastfeeding in the First Two Days of Life

The respondents were asked to identify how often their baby breastfed in the first two days of life in a question with predetermined categories. These categories were in hourly periods till six hours, then a further category of a mixture of times.

Breastfeeding frequency in the first two days was reported by a total sample of 150 (three respondents did not answer the question) as: 24% (n = 36) breastfed at one-to-two

hourly intervals, 2.7% (n = 4) at two-to-three hourly intervals, 48.7% (n = 73) at three-to-four hourly intervals, seven percent (n = 10) at five-to-six hourly intervals, and finally 18% (n = 27) were breastfeeding at a mixture of times. There were similar percentages breastfeeding at four months postpartum between the sub-samples in nearly all the categories. The exception was the five to six hourly interval for breastfeeding (n = 10): 20% (n = 2) of the NB compared with 60% (n = 6) of the LSCS sub-sample was breastfeeding at four months postpartum. The remaining 20%, (one in each sub-sample) were not breastfeeding at four months postpartum. The interpretation of the results requires caution, as the sample sizes were small. No significant statistical relationship was found between breastfeeding at four months postpartum, type of birth and pattern of baby breastfeeding times in the first two days of life. There was also no significant statistical relationship between type of birth and any of the categories of infant feeding patterns in the first two days ($?^2 = 1.021$, *df* 4, *p* .907).

5.10.2 Comparison of Breastfeeding at Four Months Postpartum, Type of Birth and Supplementary Feeding in Hospital

Almost a third of the babies in the total sample had supplementary feeds in hospital. There was a threefold greater chance of a baby having supplementary feeds if the respondent was in the LSCS sub-sample (36 vs. 12). Five respondents were unsure if their baby had supplementary feeds in hospital and were not included in the analysis. A highly significant statistical relationship was found between type of birth and supplementary feeding in hospital. The test results are shown on Table 20.

Table 20
Type of birth and supplementary feeding in hospital

	Type of birth					
	NB		LSCS		Total	
Supplementary feeding	n	% of birth type	n	% of birth type	N	% of birth type
Yes	12	18.5	36	43.4	48	32.4
No	53	81.5	47	56.6	100	67.6
Total	**65**	**100**	**83**	**100**	**148**	**100**

$?^2 = 10.324$. *df* 1, *p* .001*.

Of those respondents whose baby had supplementary feeding in hospital, 81.3% (n = 39) were breastfeeding at four months postpartum: 25.6% (n = 10) in the NB sub-sample compared with 74.4% (n = 29) in the LSCS sub-sample. By comparison 91% (n = 91) of respondents whose baby was fully breastfed in hospital were breastfeeding at four months postpartum: 51.6% (n = 47) in the NB and 48.4% (n = 44) in the LSCS sub-samples. There was no significant statistical relationship between breastfeeding at four months postpartum, type of birth and supplementary feeding in hospital (Yes, *p* .601, *df* 1, Fishers Exact Test).

5.10.3 Comparison of Breastfeeding at Four Months Postpartum, Type of Birth and 'Rooming In'

The respondents were asked if their baby had been with them in the room all the time, most of the time, or some of the time. The LSCS sub-sample was less likely to have their baby with them in the room than the NB sub-sample as Table 21 depicts. There was a marginally significant statistical relationship between type of birth and the time mother had her baby with her in her room.

Table 21
Type of birth and comparison of time baby was in the room with mother

	Type of birth					
	NB		LSCS		Total	
Baby in room with mother	n	% of birth type	n	% of birth type	N	% of birth type
All the time	41	60.3	34	40.0	75	49.0
Most of the time	25	36.8	46	54.1	71	46.4
Some of the time	2	2.9	5	5.9	7	4.6
Total	**68**	**100**	**85**	**100**	**153**	**100**

$?^2 = 6.340$, *df* 2, *p* .042*.

Approximately eighty-eight percent (87.8%; n = 36) of the NB sub-sample compared with 94.1% (n = 32) of the LSCS sub-sample, who fully 'roomed in' were breastfeeding at four months postpartum. Almost equal percentages of respondents (84% NB vs. 82.6% LSCS sub-samples) who had their baby with them 'most of the time' were breastfeeding at four months postpartum. All the respondents who responded 'for some of the time' were breastfeeding at four months postpartum. There was no significant statistical relationship between breastfeeding at four months postpartum, type of birth and any 'rooming in' categories.

5.10.4 Comparison of Breastfeeding at Four Months Postpartum, Type of Birth and Time the Milk 'Came In'

The respondents were asked to identify when their milk 'came in' in a question with predetermined categories. These were: less than two days, between two and five days, and more than five days.

Tables 22 a, b & c depicts the test results for: less than two days, between two-to-five days, and more than five days. Two respondents from the LSCS sub-sample reported their milk did not 'come in' and were not breastfeeding at four months postpartum. One

respondent in the NB sub-sample reported that she was tandem feeding and she was breastfeeding at four months postpartum. No significant statistical relationship was found between breastfeeding at four months postpartum, type of birth and the categories specified.

Table 22 a
Type of birth and when the mothers milk 'came in' (< 2 days)

		Type of birth					
Time milk came in		NB		LSCS		Total	
	Breastfeeding at 4 months	n	% of birth type	n	% of birth type	N	% of birth type
< Two days	Yes	18	100	22	91.7	40	95.2
	No	0	0	2	8.3	42	4.8
Total		**18**	**100**	**24**	**100**	**82**	**100**

p .321, *df* 1, Fishers Exact Test

Table 22 b
Type of birth and when the mothers milk 'came in' (2 – 5 days)

		Type of birth					
Between 2 - 5 days		NB		LSCS		Total	
	Breastfeeding at 4 months	n	% of birth type	N	% of birth type	N	% of birth type
	Yes	40	83.3	49	89.1	89	86.4
	No	8	16.7	6	10.9	14	13.6
Total		**48**	**100**	**55**	**100**	**103**	**100**

$?^2 = .723$, *df* 1, *p* .395.

Table 22 c
Type of birth and when the mothers milk 'came in' (> 5 days)

		Type of birth					
More than 5 days		NB		LSCS		Total	
	Breastfeeding at 4 months	n	% of birth type	n	% of birth type	N	% of birth type
	Yes	0	0	4	100	4	80
	No	1	100	0	0	1	20
Total		**1**	**100**	**4**	**100**	**5**	**100**

p .200, *df* 1, Fishers Exact Test

There was no significant statistical relationship between type of birth and when the mother's milk 'came in' ($?^2$ = 1.443, *df* 2, *p* .487). There was also no significant statistical relationship between parity and when the respondent reported her milk 'came in' ($?^2$ = .424, *df* 2 *p* .809).

5.10.5 Comparison of Breastfeeding at Four Months Postpartum, Type of Birth and Breastfeeding Help in Hospital

Of the total sample, 81% (n = 124) reported they had breastfeeding help in hospital. There was a highly significant statistical relationship between type of birth and receiving help in hospital. Table 23 depicts the test results.

Table 23
Type of birth and help in hospital

	Type of birth					
	NB		LSCS		Total	
Received breastfeeding help in hospital	n	% of birth type	n	% of birth type	N	% of birth type
Yes	48	70.6	76	89.4	124	81
No	20	29.4	9	10.6	29	19
Total	**68**	**100**	**85**	**100**	**153**	**100**

$?^2$ = 8.714, *df* 1, *p* .003*.

Of the respondents who received help in hospital, 81.3% (n = 39) in the NB and 86.6% (n = 66) in the LSCS sub-samples were breastfeeding at four months postpartum. All the respondents in both sub-samples who did not receive help in hospital were breastfeeding at four months postpartum. There was no significant statistical relationship between breastfeeding at four months postpartum, type of birth and breastfeeding receiving help in hospital ($?^2$ = .709, *df* 1, *p* .400).

The respondents were also asked who helped with breastfeeding in hospital in a multi-response question. There was an average of 1.2 responses per respondents (0.8 responses for the NB vs. 1.2 responses for the LSCS sub-samples). The results are shown in Table 24.

Table 24
Who helped with breastfeeding in hospital

	Type of birth					
	NB		LSCS		Total	
Person who helped with breastfeeding in hospital	n	% of birth type	n	% of birth type	N	% of birth type
Hospital midwife/ registered nurse	41	56.2	70	68.0	111	63.1
LMC	24	32.9	21	20.3	45	25.6
Family member	5	6.8	5	4.9	10	5.7
Friend	2	2.7	3	2.9	5	2.8
Other not specified	1	1.4	4	3.9	5	2.8
Total	**73**	**100**	**103**	**100**	**176**	**100**

5.10.6 Comparison of Breastfeeding at Four Months Postpartum, Type of Birth and Breastfeeding Problems in Hospital

Having a breastfeeding problem was slightly more common for the LSCS sub-sample than the NB sub-sample. Type of birth and having a breastfeeding problem in hospital were significantly statistically related. Table 25 shows the test results.

Table 25
Type of birth and having a breastfeeding problem in hospital

	Type of birth					
	NB		LSCS		Total	
Breastfeeding problem	n	% of birth type	n	% of birth type	N	% of birth type
Yes	38	55.9	64	75.3	102	66.7
No	30	44.1	21	24.7	51	33.3
Total	**68**	**100**	**85**	**100**	**153**	**100**

$?^2 = 6.406$, df 1, p .011*.

The number of respondents experiencing a breastfeeding problem and not breastfeeding at four months postpartum was small in total (n = 17) with 41.2% (n = 7) in the NB sub-sample compared with 58.5% (n = 10) in the LSCS sub-sample. There was no significant statistical relationship between breastfeeding at four months postpartum, type of birth and having a breastfeeding problem (yes, $?^2 = .134$, *df* 1, *p* .714). As could be expected from practice experience there was a highly significant statistical relationship between having a breastfeeding problem in hospital and receiving breastfeeding help ($?^2 = 16.679$, *df* 1, $p < .0005$*).

5.10.7 Type of Breastfeeding Problem in Hospital

The responses to questions about the type of breastfeeding problems experienced in hospital are reported in Table 26. The LSCS sub-sample reported breastfeeding problems at a higher rate in all categories. There was an average of 1.5 responses in the total sample; 1.3 responses per respondent in the NB sub-samples and 1.6 per respondent in the LSCS sub-sample.

Table 26
Type of breastfeeding problems

	Type of birth					
	NB		LSCS		Total	
Type of breastfeeding problem in hospital	n	% of birth type	n	% of birth type	N	% of birth type
Attachment difficulties	28	30.7	45	32.5	73	31.8
Nipple problems	22	24.2	28	20.1	50	21.7
Breast pain or discomfort	19	20.9	23	16.5	42	18.3
Engorgement	10	11.0	22	15.8	32	13.9
Other problems, not specified	6	6.6	12	8.6	18	7.8
Low milk supply	6	6.6	9	6.5	15	6.5
Total	**91**	**100**	**139**	**100**	**230**	**100**

5.10.8 Comparison of Breastfeeding at Four Months Postpartum, Type of Birth and Time Baby Started to Feed Well

The respondents were asked to report when their baby started to feed well in a question with pre-determined categories. These were: within three days of the birth, after three days and by day five, after five days and by day ten, and after day ten and by one month old, and finally never fed well. The last three categories were collapsed into one because there were fewer respondents in each category.

The mothers reported their baby started to feed well at the following rates; 45.1% (n = 69) within three days (44.9% NB vs. 55.1% LSCS sub-samples); 21.6% (n = 33) between three and five days (51.5% vs. 48.5% LSCS sub-samples); 11.8% (n = 18) after day five and by day ten (38.9% NB vs. 61.1% LSCS sub-samples); 21.6% (n = 33), and finally more than 10 days (39.4% NB vs. 60.6% LSCS sub-samples). The percentages of babies feeding well between the two sub-samples were similar in the first three categories. There was no significant statistical relationship between type of birth and when the baby started to feed well ($?^2 = 1.241$, *df* 3, *p* .743).

There was also no significant relationship between breastfeeding at four months postpartum, type of birth and the time the baby started to breastfeed well.

5.10.9 Comparison of Breastfeeding at Four Months Postpartum, Type of Birth and Discharge Time

The average stay in hospital was 2.5 days for the NB and 4.8 days for the LSCS sub-sample. Of the NB sub-sample, 65% (n = 43) were discharged from hospital before the

third day; 83.7% (n = 36) were breastfeeding at four months postpartum. As expected, just one woman (1.2%) of the LSCS sub-sample was discharged before the third day and she was breastfeeding at four months postpartum. Of the LSCS, 22.3% (n = 19) and 3% (n = 2) of the NB sub-samples remained in hospital after the fifth day. Both the respondents from the NB and 78.9% (n = 15) of the LSCS sub-sample still in hospital after the fifth day were breastfeeding at four months postpartum. There was no significant statistical relationship between breastfeeding at four months postpartum, type of birth and days in hospital.

As anticipated from practice experience there was a highly significant statistical relationship between type of birth and time in hospital ($?^2 = 91.610$, df 5, $p < .0005$*).

5.11 Discussion

No significant statistical relationships were found between breastfeeding at four months postpartum, type of birth and: frequency of infant feeding in the first two days, supplementary feeding in hospital, 'rooming in', time the mother's milk 'came in', breastfeeding help in hospital, breastfeeding problems in hospital, time the baby started to feed well, and finally when the respondent was discharged from hospital. There were highly significant statistical relationships between type of birth and: supplementary feeding in hospital, and receiving help in hospital. There was also a significant statistical relationship between type of birth and having a breastfeeding problem in hospital, and a marginal statistically significant relationship between type of birth and 'rooming in'.

5.12 Breastfeeding: The Influence of Events Following Discharge

The following section continues to address the study's third question and reports events and experiences following discharge, which were identified in the literature review as having an influence on breastfeeding duration. The events reported are: breastfeeding support, and breastfeeding satisfaction. Respondents' education levels are reported in this section for expediency. Where appropriate these events and experiences were also analysed with type of birth, or breastfeeding at four months postpartum, and the test results of interest are reported.

5.12.1 Comparison of Overall Breastfeeding Support

The respondents were asked who they considered supported them the most during their breastfeeding experience in a multi-response question. Table 27 shows the results of the test. There was an average of 1.9 responses over all; 1.6 for each respondent in the NB sub-sample and two for each respondent in the LSCS sub-sample.

Table 27
Person/group giving the most breastfeeding support

	Type of birth					
	NB		LSCS		Total	
Person/group giving the most support	n	% of birth type	n	% of birth type	N	% of birth type
Partner	42	37.9	55	31.8	97	34.2
Midwife/s	25	22.5	46	26.6	71	25.0
Family/*whanau*	22	19.8	24	13.9	46	16.2
Support other	9	8.1	15	8.7	24	8.5
Friends	10	9.0	13	7.5	23	8.1
Nurse	1	0.9	9	5.2	10	3.5
Obstetrician or GP	0	0	8	4.6	8	2.7
Support groups	2	1.8	3	1.7	5	1.8
Totals	**111**	**100**	**173**	**100**	**284**	**100**

5.12.2 Effect of Caesarean Section on Breastfeeding

The second hypothesis for this study was that mothers having a caesarean section would breastfeed for a shorter time, therefore the question was asked; "If you had a caesarean birth, do you think it has affected your ability to breastfeed?" Eighty-eight respondents answered this question: 83 from the LSCS and five from the NB sub-samples. Twenty-two of the respondents said 'yes' the caesarean section had an effect on breastfeeding. Of those who said a caesarean section had an effect on their breastfeeding 18% (n = 4) had ceased breastfeeding by four months postpartum. By comparison, 10.6% (n = 7) who said that a caesarean section had no effect on their breastfeeding had ceased breastfeeding by four months postpartum. There was no significant statistical relationship between having a caesarean section and the respondents' perception of the effect a caesarean section had on breastfeeding (p .278, df 1, Fisher's Exact Test).

5.12.3 Breastfeeding Satisfaction

The respondents were asked if they were satisfied with their breastfeeding experience in a yes/no question. Overall satisfaction was high at 85.5% (n = 130). More of the LSCS sub-sample were satisfied than the NB sub-sample. Table 28 displays the test results. One respondent in the LSCS sub-sample elected not to answer this question. There was no significant statistical relationship between type of birth and breastfeeding satisfaction.

Table 28
Type of birth and breastfeeding satisfaction

	Type of birth					
	NB		LSCS		Total	
Breastfeeding satisfaction	n	% of birth type	n	% of birth type	N	% of birth type
Yes	57	83.8	73	86.9	130	85.5
No	11	16.2	11	13.1	22	14.5
Total	**68**	**100**	**84**	**100**	**152**	**100**

$?^2$ = .288; *df* 1, *p* .591.

In the respondents (n = 125) who were breastfeeding at four months postpartum satisfaction was high: 44.8% in the NB vs. 55.2% in the LSCS sub-samples. Four percent (n = 5) of the total sample who were satisfied with breastfeeding were not breastfeeding at four months postpartum; 80% (n = 4) were in the LSCS sub-sample. However, as could be predicted, of those respondents not satisfied (n = 22), 63.6% (n = 14) were not breastfeeding at four months postpartum; 57% (n = 8) in the NB and 43% (n = 6) in the LSCS sub-samples. There was no significant statistical relationship between breastfeeding at four months postpartum, type of birth and breastfeeding satisfaction ($?^2$ = .288, *df* 1, *p* .591).

Finally there was a highly significant statistical relationship between breastfeeding at four months postpartum and being satisfied with breastfeeding ($?^2$, = 61.499, *df* 1, *p*< .0005*).

5.12.4 Comparison of Breastfeeding at Four Months Postpartum, Type of Birth and Education Levels

The respondents were asked to indicate their highest education level achieved in a pre-determined category question. Three respondents elected not to answer this question and provided no explanation for this. There was no significant statistical relationship

between breastfeeding at four months postpartum, type of birth, and any of the education level categories enquired about. There was no significant statistical relationship between type of birth and education levels ($?^2$, = 2.979, *df* 3, *p* .395). The results of the analysis between education levels and breastfeeding at four months have been presented as total sample numbers only. There was no statistically significant relationship between education level and breastfeeding at four months postpartum. Table 29 show the results.

Table 29
Education level and breastfeeding at four months postpartum

	Breastfeeding at four months					
Level of education	Yes	%	No	%	Total	%
No formal education	11	8.3	2	11.1	13	8.7
High school qualification	37	28.0	9	50.0	46	30.7
Certificate of diploma	51	36.6	3	16.7	54	36.0
University degree	33	25.0	4	22.2	37	24.7
Total	**132**	**100**	**18**	**100**	**150**	**100**

$?^2$ = 4.807, *df* 3, *p* .186

5.13 Discussion

There were no significant statistical relationships between breastfeeding at four months postpartum, type of birth and breastfeeding support, breastfeeding satisfaction, or education levels. Nor was there a significant statistical relationship between breastfeeding at four months postpartum and education level. There was highly significant statistical relationship between breastfeeding at four months postpartum and satisfaction.

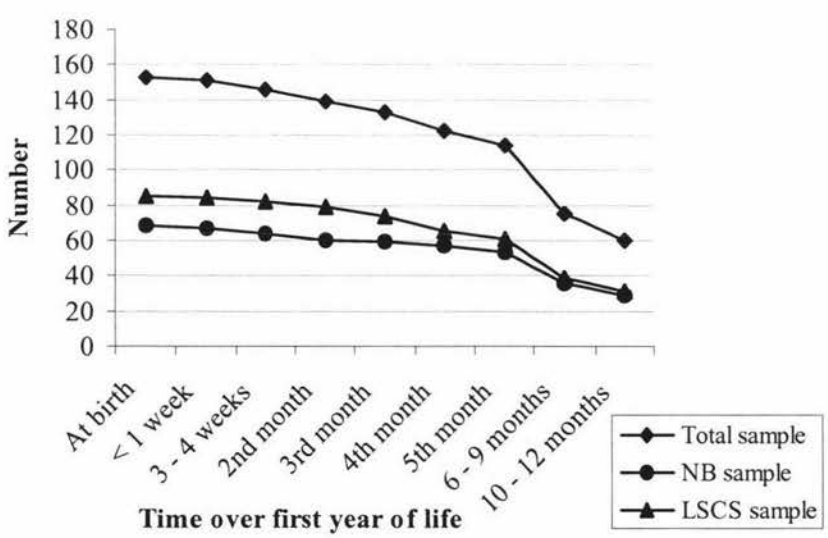
5.14 Breastfeeding Cessation

This section reports breastfeeding cessation rates and the reasons the respondents gave for stopping breastfeeding.

5.14.1 Breastfeeding Cessation Rates

The respondents were asked to specify when they stopped breastfeeding their baby. Figure Four shows the comparison of the breastfeeding cessation between the total sample and the two sub-samples over the first year of the baby's life. At one year 37.3% of the total sample (n = 57) were breastfeeding; 42% (n = 28) were in the NB sub-sample versus 35% (n = 29) in the LSCS sub-sample. One respondent in the NB and two from the LSCS sub-sample were still breastfeeding and their baby was under one year old so they were not included in this figure.

Figure 4
Comparison of breastfeeding cessation over first year of life



5.14.2 Reasons the Respondents Stopped Breastfeeding

The respondents were asked why they stopped feeding in a multi-response question. Table 30 shows the reasons given for breastfeeding cessation. The largest percentage of the total sample reported 'other' reasons for breastfeeding cessation with a higher percentage in the NB sub-sample. The 'other' reasons respondents reported for breastfeeding cessation included: problems with the baby such as "biting" or baby "getting to big to sit still"; inconvenience for the mother; the mother reporting she felt it was time to stop, or had 'had enough'; knowledge such as "heaps of milk but not enough goodness"; breastfeeding being reduced to a "comfort thing"; problems related to medical issues for mother or baby; finally pressure from family.

Table 30
Reason for breastfeeding cessation

	Type of birth					
	NB		LSCS		Total	
Reason for breastfeeding cessation	n	% of birth type	n	% of birth type	N	% of birth type
Other	25	28.4	20	20.0	45	23.9
Poor milk supply	11	12.5	17	17.0	28	14.9
Baby self-weaned	11	12.5	17	17.0	28	14.8
Tiredness	10	11.4	12	12.0	22	11.7
Return to work	6	6.8	11	11.0	17	9.0
Baby did not feed well	5	5.7	6	6.0	11	5.9
Didn't like breastfeeding	6	6.8	5	5.0	11	5.9
Pain/discomfort	5	5.7	5	5.0	10	5.3
Sore/cracked nipples	5	5.7	3	3.0	8	4.3
Mastitis	3	3.4	2	2.0	5	2.7
Lack of support	1	1.1	2	2.0	3	1.6
Total	**88**	**100**	**100**	**100**	**188**	**100**

5.15 Summary

This chapter has provided the answers to the research questions outlined in Chapter One (p. 8/9). There was a marginally significant statistical relationship between breastfeeding at four months postpartum, type of birth, and prior breastfeeding experience. There were highly significant statistical relationships between type of birth and: time of first cuddle, concomitant skin-to-skin contact, time of first breastfeed, supplementary feeding in hospital, and receiving help in hospital. There was a significant statistical relationship between type of birth and having a breastfeeding problem in hospital, and a marginally statistically significant relationship between type of birth and 'rooming in'.

Other events that were expected and identified as highly significant statistically were: multiparity and having breastfed before, having a breastfeeding problem in hospital and receiving help, type of birth and time in hospital, and breastfeeding at four months postpartum and satisfaction. There and finally there was a marginally significant statistical relationship between breastfeeding at four months postpartum and type of caesarean section.

The results of the study are discussed in the following chapter.

CHAPTER SIX: DISCUSSION

6.1 Introduction

In this chapter, the results of the study presented in Chapter Five are discussed in relation to the study question, aims and objectives. The opportunity is taken to explore ways in which the study confirms existing knowledge, or contributes new knowledge, of our understanding of women's experiences and events during the perinatal period and any impact they might have on breastfeeding duration.

The results are discussed in sections as they were presented. The overall breastfeeding rates and breastfeeding status of the total sample and sub-samples are discussed first. The significant statistical relationships between breastfeeding at four months postpartum, type of birth and perinatal events and experiences are discussed next. The relationships between type of birth and some events and experiences of the respondents are incorporated into the discussion as appropriate. Discussion of the non-significant findings in the study follows. The discussions incorporate evidence from the literature review and reflect practice experience and expectations. Lastly the fourth and fifth aims of the study, which were the effectiveness of the data collection tools, are discussed.

6.2 Research Question

The research question this study sought to answer was:

- Does having a caesarean section detrimentally affect the duration of breastfeeding when compared with normal birth, and if so, can any events or experiences be identified, which might be significant?

There was no convincing evidence that type of birth and events and experiences under consideration had an influence on breastfeeding duration in the current study. There

was one marginally significant statistical association was found between breastfeeding at four months postpartum, type of birth and prior breastfeeding experience. Evidence presented in Chapter Five also shows there were significant statistical associations between type of birth and some of the events and experiences of the women following birth. Other significant statistical relationships were reported in Chapter Five and these are discussed in the appropriate section of this chapter.

6.3 The First Aim of the Study

- How many of the respondents were breastfeeding four months postpartum after the birth of their baby?

6.3.1 Overall Breastfeeding Rates at Four Months Postpartum

The evidence presented in Chapter Five has shown that the rates of breastfeeding at four months postpartum were high in the current study. It is useful to attempt to put the breastfeeding rates found in the current study into the New Zealand context. Because of the differences in study methodologies and measures of breastfeeding duration used in other research such comparisons are problematical.

The overall breastfeeding rate of 87.6% in the current study was higher than the 80% reported by Benn, Budge, Anderson and Wright (2003), in their survey of women's experiences in a New Zealand region not dissimilar to the one in the current study. It was higher than; the 79% national breastfeeding rate for 2001 (Ministry of Health, 2003); the 71.5% breastfeeding at three months reported by Essex et al., (1995) in a New Zealand study; the 68% reported by Heath, Tuttle, Simons, Cleghorn and Parnell

(2002) in Dunedin at four months postpartum; and considerably higher than the 59%, at 4-6 month, reported by the Royal New Zealand Plunket Society (2001) in 2000. The breastfeeding rates of the Essex et al., (1995) study are comparable because they used similar breastfeeding definitions to those used in the current study. The rates reported by Benn et al., (2003), and the Ministry of Health (2003) are not directly comparable with the current study as they reported breastfeeding rates on transfer to Well-child Services four to six weeks after birth.

It could be speculated that the over representation of European women, and the absence of women under 20 years old in the current study (see p. 63) could be reasons for the high percentage of those breastfeeding at four months postpartum. The under twenties are yet to achieve high breastfeeding rates in New Zealand (Ford et al., 1994; Ministry of Health, 2003). European women are a population who are already achieving high rates of breastfeeding nationally (Ministry of Health, 2003).

6.3.2 Breastfeeding Status at Four Months Postpartum

The current study's findings of 64.1% of the total sample exclusively breastfeeding, and an additional 11.8% fully breastfeeding at four months postpartum was higher than the New Zealand Ministry of Health's (2002) breastfeeding target of 57%, exclusive or full breastfeeding at three months. The Royal New Zealand Plunket Society (2001) reported a similar 11% of babies fully breastfeeding at four to six months in 2000 with an additional 7% exclusively breastfeeding in the same year.

Benn et al., (2003), by comparison, reported 73.2% exclusive breastfeeding on discharge to Well-Child Services. Essex et al., (1995) reported 89% of the women in

their study were exclusively breastfeeding and 11% partially breastfeeding at three months. By six months, 56% of the infants in the Essex et al., study were being partially breastfeed. The percentage (87.6%) of the respondents in the current study who were either fully, or partially breastfeeding four months postpartum was 8.6% more than those reported by the Ministry of Health (2003) at time of transfer to Well-child Services.

6.4 The Second Aim of the Study

- Do women having a caesarean section have a different duration of breastfeeding (four months after the birth of the baby) compared to women having a normal vaginal birth?

The evidence presented in Chapter Five has shown that the rates of breastfeeding at four months postpartum were high in both sub-samples. This suggests that neither of the two hypotheses developed for the study have been supported. The hypotheses were:

H_1: A normal vaginal birth is associated with a longer duration of breastfeeding

H_2: A caesarean section is associated with a shorter duration of breastfeeding.

There is evidence that caesarean section can have a detrimental effect on breastfeeding initiation (DiMatteo et al., 1996; Hirose et al., 1996; James 1999; Rajan 1994) however evidence of the relationship between caesarean section on breastfeeding duration is inconclusive (Churchill, 1997). Research that supports the current study's finding that having a caesarean section had no effect breastfeeding duration includes: Clements et

al., (1997); Datta (1990); Janke (1988); Kearney et al., (1990); Pérez-Escamilla et al., (1996); Vestermark et al., (1990).

In the current study those having a caesarean section were less likely to exclusively breastfeed and conversely more likely to fully, and twice as likely to partially, breastfeed as those having a normal birth (see p. 74). Benn et al., (2003) raise the issue that women having a caesarean section can struggle with breastfeeding and end up combination feeding as in the current study. Respondent 139 illustrated this with the following comment: "I still had to top him up with a bottle, but I breastfed him ... always in the night".

6.5 The Third Aim of the Study

- What was the significant effect, if any, of the birth and breastfeeding events, for the women who have had a caesarean section compared to women who have had a normal birth, on breastfeeding duration?

As discussed in the literature review there is a wealth of evidence, which suggests that the events and experiences a woman has during birth and in the postnatal period, can influence breastfeeding duration. The evidence presented in Chapter Five indicates that of all the events and experiences examined in the current study only prior breastfeeding experience was statistically significantly associated with type of birth and duration of breastfeeding.

The question then was; do women having a caesarean section have a different experience than women having a normal birth? There is a wealth of information to

suggest that women who have a caesarean section do have different experiences as the literature review indicates. The current study provides supporting evidence in the following experiences; time of first cuddle, concomitant skin-to-skin contact, time of first breastfeed, supplementary feeds in hospital, 'rooming in' while hospital, having a breastfeeding problem and receiving help in hospital. These experiences are discussed in the following sections.

6.6 Breastfeeding, Type of Birth and Prior Breastfeeding Experience – A Significant Statistical Finding

6.6.1 Prior Breastfeeding Experience

The evidence presented in Chapter Five has shown that breastfeeding at four months postpartum, type of birth and having prior breastfeeding experience was marginally significant statistically (p .049*). Prior breastfeeding success has been positively associated with breastfeeding after normal birth, but not after caesarean section (Janke, 1988). Prior experience is likely to increase breastfeeding duration, because it is closely linked to "preparedness or self-efficacy, which is an individual's self-belief" (confidence) in being able to successfully perform a task (Dennis & Faux, 1999, p. 400).

Women in the current study repeatedly commented on the value of prior breastfeeding knowledge and experience, in shaping their confidence and capacity to breastfeed. Respondent 33 said; "With my second baby it seemed much easier. However I did need support with my first baby despite my professional experience". Respondent 95 commented:

> My first child was fed for 13 months, second for 15 months and my third is now eight months and I intend to feed for over one year. It has definitely got easier with experience. Breastfeeding a new baby after a C-section is definitely not easy but women need to know that it does get a lot easier in a short space of time.

However knowledge and experience do not entirely mitigate other life events such as coping with a large family and associated stressors as Respondent 90 indicated:

> My first son, I breastfed for nine months. After that I only fed the next one for four months postpartum. My next daughter four months postpartum, my next son three and a half. Bottle-feeding was more convenient because feed times were short and longer apart. Breastfeeding took ages [the time] and was closer [shorter] between feeds. I could not relax during feeding because I had so much to do. The first son was enjoyable to feed but after that I did not enjoy it. I had five children under the age of seven. Not something I would recommend to anyone.

6.7 Type of Caesarean Section and Breastfeeding at Four Months Postpartum – A Significant Statistical Finding

The evidence in Chapter Five demonstrated a marginally significant statistical relationship between a planned or unplanned caesarean section and breastfeeding at four months postpartum (p .046*). All 21 respondents who had a planned caesarean section were breastfeeding at four months compared with 84.1% (n = 53) of those having an unplanned caesarean section.

There is some evidence in the breastfeeding literature concerning the influence that planned and unplanned caesarean section might have on breastfeeding duration. Lie and Juul (1988) found no difference with breastfeeding duration for women having a planned or unplanned caesarean section although Weiderpass et al., (1998) found that a planned caesarean section negatively affected breastfeeding duration. Mathur et al., (1993) did not comment on breastfeeding duration but found that mothers having a

planned caesarean section under epidural were statistically significantly more likely to initiate breastfeeding. Churchill (1997) comments that women having unplanned caesarean sections may "blame their babies for the long, painful and unproductive labour that results in an operative delivery" (p. 85) and it could be speculated that this emotional response might influence maternal breastfeeding behaviours in negative, or positive ways. Unplanned caesarean section can result in maternal stresses because of a changed birth plan (Churchill, 1997) and related maternal or foetal distress and often after a long labour. Other reasons that caesarean section can detrimentally effect breastfeeding duration were outlined in the literature review in Chapter Two.

Women made comments about the physical limitation a caesarean section placed on the process of breastfeeding. Respondent 41 commented:

> "I found it incredibly hard to sit up or retrieve baby from the crib. Getting out of bed and getting comfortable was extremely painful for the first two weeks",

And Respondent 73 said,

> "I contracted [an] infection in my stomach from the caesarean. I found it hard to get full mobility at some stages from my caesarean so I felt that I didn't want more discomfort through breastfeeding, which caused me discomfort as well".

Respondent 20, experiencing negative effects of surgery, said, "Positioning myself and the baby was very difficult and often (in the first couple of months) very painful…".

6.8 Breastfeeding, Type of Birth and Early Postpartum Events and Experiences – Significant Statistical Findings

6.8.1 Timing of Mother-baby First Cuddle

A highly significant statistical relationship (p <.0005*) between breastfeeding at four months postpartum, type of birth, and time of first cuddle was found in the current study. Those having a caesarean section were later cuddling their baby than those having a normal birth: a finding supported by Churchill (1997) and Rowe-Murray (2002). Neither of these studies differentiates between planned or unplanned caesarean section.

The finding that almost all the NB sub-sample cuddled their baby in the first hour is evidence that, for this sub-sample, there were supportive health care practices operating. The finding that almost three quarters of the LSCS sub-sample cuddled their baby within the first hour also suggests that healthcare practices were supportive of early mother-baby contact following caesarean section, although the intervention of caesarean section may negatively impact on the experience. Respondent 12 illustrated this when she said: "Within one hour I cuddled but I had no feeling in my arms so asked to have him taken off me for fear of dropping him, then it was between two and four hours [before I held him again]".

6.8.2 Concomitant Mother-baby Skin-to-skin Contact

There was a highly significant statistical association between type of birth and concomitant skin-to-skin contact (p <.0005*). The percentages of concomitant skin-to-

skin contact for both sub-samples reported in Chapter Five are less than optimal: 65% (n = 44) in the NB and 14% (n = 12) in the LSCS sub-samples (see p. 88). The percentages are, however, higher than those reported by Rowe-Murray and Fisher (2002) in their Australian study. The non-significant statistical association between breastfeeding at four months postpartum, type of birth and concomitant skin-to-skin contact found in the current study suggests that concomitant skin-to-skin contact was not a critical factor in breastfeeding continuation for the respondents and as such is a finding contrary to prior studies (Ali & Lowry, 1981; Anderson et al., 2003; Pérez-Escamilla et al., 1994).

6.8.3 Time of First Breastfeed

The time of initiation of breastfeeding and type of birth were not significantly statistically associated with breastfeeding duration in the current study and is a finding supported by Kearney et al., (1990) and Vestermark et al., (1990). Ekström, Widström and Nissen (2003), Mathur et al., (1993) and Tamminen et al., (1983) found to the contrary. The women in the LSCS sub-samples were later initiating breastfeeding than the NB sub-sample. As such this finding is consistent with many other studies (Banapurmath & Selvamuthukumarasamy, 1995b; Chapman & Pérez-Escamilla, 1999b; Churchill, 1997; DiMatteo et a1., 1996; Gorin-Peralta & Rodriguez, 2000; Hirose et al., 1996; James, 1999; Janke, 1988; Kearney et al., 1990; Mathur et al., 1993; Pérez-Escamilla et al., 1996; Rowe-Murray & Fisher, 2002; Vestermark et al., 1990). That 54.1% of the LSCS sub-sample reported breastfeeding their baby within the first hour following birth indicates that healthcare practices were supportive of early breastfeeding initiation for these women.

Early initiation of breastfeeding following birth has been identified as increasing breastfeeding duration by several authors (Enkin et al., 2000; Procianory et al., 1984: Salariya, Easton & Carter, 1978). In the current study, the first breastfeed for the entire study population occurred within four hours, which Enkin et al, (2000) consider is within the acceptable time period for initiating breastfeeding. Riordan and Auerbach (1998) are of a different opinion and believe the first breastfeed should occur, where possible, immediately after birth; a position that has the support of the World Health Organisation (1998). The World Health Organisation state the optimum time of breastfeeding initiation to be within the first half-hour of birth in their document *The Ten Steps to Successful Breastfeeding.* Riordan and Auerbach do not provide any further guidance concerning the optimal time for breastfeeding initiation.

6.9 Breastfeeding, Type of Birth and Subsequent Postpartum Events and Experiences – Significant Statistical Findings

6.9.1 Supplementary Feeding in Hospital

A third of the babies received supplementary feeding in hospital in the current study and this was highly significant statistically associated with birth type (p .001*). There was no significant statistical association with breastfeeding at four months postpartum. Aliperti and MacAvoy (1996), Datta (1990) and Vestermark et al., (1990) also did not find an association between minimal initial supplementary feeding and breastfeeding duration. These authors do not always provide information concerning how much minimal supplementation was. The current study's findings differ from other studies who report that supplementary feeding affects breastfeeding duration (Bernard-Bonnin et al., 1989; Pérez-Escamilla et al., 1993; Samuels et al., 1985). An explanation for the

current study's finding regarding supplementary feeding not affecting breastfeeding duration could be related to the amount, duration, or type of supplementary feeds that the baby received. The current study did not canvas the amount, or the type of supplementary feeding the baby received.

The babies in the LSCS sub-sample, however, were more likely to be given supplementary feeding than the NB sub-sample as Chen (1992) also found. Furthermore the longer the mother was in hospital the more likely the baby was to receive supplementary feeds in the current study. There are possible explanations for this: the existence of a feeding problem; a fractious or distressed infant as Respondent 80 commented: "First night. Baby could not quite get the hang of it and appeared hungry [and] was fed out of a cup"; a mother requesting supplementary feeds for their baby; or at healthcare professional instigation. Supportive professional behaviour based on breastfeeding knowledge can positively influence decision-making regarding supplementary feeding by a mother (Aliperti & MacAvoy, 1996; Bernaix, 2000; Rajan, 1993).

6.9.2 Mother-infant 'Rooming In' in Hospital

The NB sub-sample was more likely to have continuous rooming than the LSCS sub-sample and there was a marginal significant statistical association between 'rooming in' and type of birth (p .042*). Kroeger (2004) supported this studies finding that normal birth respondents were more likely to have their baby with them continuously than the LSCS sub-sample. Continuous 'rooming in' has been reported as having a positive impact on breastfeeding duration (Lawson & Tullock, 1995; Mathur et al. 1993; Tamminen, et al., 1983). Any detrimental effects on breastfeeding duration of partial

'rooming in' were not apparent at four months postpartum, which is a finding supported by Enkin et al., (2000).

It could be speculated that reasons respondents were partially 'rooming in' were maternal request; health professional influence; and a direct consequence of the physical effects of the caesarean section. The longer the postnatal stay the greater the chance of the mother and baby being separated (Enkin et al., 2000), although in the current study 40% of the NB sub-sample were partially 'rooming in' and spent on average 2.3 days less in hospital than the LSCS sub-sample. Supportive health care practices should limit mother-baby separation for social reasons (Dennis, 2002; Enkin et al., 2000).

6.9.3 Breastfeeding Support in Hospital

As could be anticipated there was statistical significant relationship (p .003*) between type of birth and having breastfeeding support in hospital. Those in the LSCS sub-sample were more likely to receive help than the NB sub-sample, which is a finding supported by Rowe-Murray and Fisher (2002). One influencing factor was the LSCS sub-samples longer hospital stay provided more time for the identification of breastfeeding problems and subsequent breastfeeding help.

Respondents also commented on a lack of professional support. It might be speculated reasons for lack of support include: lack of knowledgeable staff as postulated by Rajan (1993). Other reasons might have been; midwives being unaware of women experiencing breastfeeding problems, or, time constraints experienced by midwives limiting contact time with the mother.

It could be postulated that the normal birth respondents were less likely to receive help because of a perception by midwives that these women were less likely to require help because of the normality of their birth. It could also be postulated that midwives could make assumptions that multiparous women had existing breastfeeding knowledge and this led to less breastfeeding support being provided (85% of the NB sub-sample were multiparous women vs. 57% of the LSCS sub-sample). Lastly it might be speculated that those respondents, particularly in the NB sub-sample, who had a shorter hospital stay and therefore less contact time with midwives, perceived they did not have the support they required.

There were three opportunities for women in the current study to indicate who provided professional breastfeeding advice and support for them during their maternity and breastfeeding experience. What emerged was that the hospital midwife/registered nurse was the most likely person to provide that breastfeeding support.

Breastfeeding support by a knowledgeable individual is a key component of successful breastfeeding (Aliperti & MacAvoy, 1996; Bernaix, 2000; Hong, Callister & Schwartz, 2003; Inch & Renfrew, 1989; Kearney et al., 1990; Rajan, 1993; Tarkka et al., 1998), while unhelpful support or advice can become a barrier to successful breastfeeding (Hailes & Wellard, 2000). In the current study the hospital midwife/registered nurse provided 63.1% of the breastfeeding support and the LMC provided a further 25.6%. Benn et al., (2003) also found the hospital midwife provided most breastfeeding help in hospital (86.7%).

Respondents commented about the usefulness of the support provided. Respondent 134 said; "The hospital midwives were great". Respondent 171 added to this theme when

she said: "for this birth [caesarean] the staff were awesome, very confident, skilful and willing to help".

Others said not all breastfeeding support they received was appropriate. Non-supportive behaviours included conflicting advice as reported by Respondent 92: "hospital midwives – lots of conflicting info about positioning – holding finger on breast to make a space for nose", or "midwives' advice wasn't consistent. They all had different views" (Respondent 27). Respondent 49 added to the issue of conflicting advice with a comment on behaviour, which could be interpreted as a lack of concern. She said, "I found the lack of consistent methods with the different midwives difficult, all had different ideas and some were rude and impatient which made it hard for me to relax and enjoy it".

While conflicting advice is a phrase commonly heard in relation to breastfeeding care there may well be an explanation for a mother's interpretation that the advice given is in conflict with prior advice offered. Infant feeding behaviours can change on a day-to-day, or even hour-to-hour, basis and what suits a baby one day might well be entirely inappropriate the next. Lloyd (1999, p. 149) commented that "all advice given to breastfeeding mothers needs to be updated and modified feed by feed in light of prevailing circumstances" and she suggests that a better phrase would be "progressive advice". However it is the mother's interpretation of the advice that is critical and that a mother interprets the advice as 'conflicting' is the key element, which health professionals caring for mothers need to address.

6.9.4 Breastfeeding Problems in Hospital

As reported in Chapter Five there was a statistical significant relationship (p .011*) between type of birth and having a breastfeeding problem in hospital. Possible explanations for why the LSCS sub-sample might experience more breastfeeding problems in hospital than the NB sub-sample include: physical effects of surgery hindering maternal-infant interaction, (Churchill, 1997; DiMatteo, et al., 1996; Hirose et al., 1996; James, 1999; Rajan, 1994); labour and birth medications influencing early infant behaviour (Crowell et al., 1994; Halpern et al., 1999; Walker, 1997; Wittels et al., 1997); and women experiencing unsupportive care (Enkin et al., 2000), although unsupportive care was not limited to the LSCS sub-sample. The physical environment may add further difficulties affecting breastfeeding comfort and positioning (Martell, 2003; Rajan, 1993) although the NB sub-sample could also be affected (Martell, 2003). Finally the LSCS sub-sample could also have been more likely to report breastfeeding problems and receive breastfeeding support simply because of their longer hospital stay.

Having a breastfeeding problem in hospital was not statistically associated with termination of breastfeeding before four months postpartum for women in either sub-sample: a finding supported by Ertem et al., (2001). There were commonalities with the problems experienced by the women in both sub-samples. The breastfeeding problems reported in the current study were; attachment difficulties, nipple problems, breast pain or discomfort, engorgement, and low milk supply. These have been identified in other research (Beasley et al., 1998; Benn et al., 2003; Bodley & Powers, 2002; Cooke, Sheehan & Schmied, 2003; Enkin et al., 2000; Lawrence & Lawrence, 1999; Lowe, 1988; Scott et al., 2001).

The overall breastfeeding problems in hospital reported in the current study were generally similar to those reported by Benn et al., (2003). One difference was attachment difficulties, which were reported by the 31.7% of the respondents in the current study, compared with 60% in the Benn et al., study. The current study found equal percentages of mothers experienced nipple problems (21.6%), and similar percentages of engorgement as Benn et al., (6.5% vs. 5.6%). By comparison Cooke et al., (2003) in an Australian study, reported 53% of women experienced nipple problems, 48% with poor/difficult attachment, and 31% experienced insufficient milk. Cooke et al., also reported numerous other breastfeeding problems, in small percentages. Cook et al's., study is not directly comparable because they reported problems at two weeks postpartum.

Having a breastfeeding problem and receiving help in hospital was also highly significantly statistically associated (p <.0005*). This finding is expected as the provision of breastfeeding support falls within the midwifery scope of practice (New Zealand College of Midwives, 2002).

6.9.5 Length of Hospital Stay

The evidence presented in Chapter Five has shown that the length of hospital stay was highly significantly associated with birth type (p < .0005*). Length of stay in New Zealand is dependent on birth type and maternal clinical condition. The existing evidence concerning time in hospital following birth suggests that it allows not only for recovery but also allows time for positive (Heck, Schoendorf, Chávez & Braveman, 2003; Rajan, 1993), and negative (Aliperti & MacAvory, 1996; Enkin et al., 2000), health care and support to influence mothering and breastfeeding per se. The evidence

of adverse outcomes associated with early discharge is inconclusive (Brown, Small, Faber, Krastev & Davis, 2002).

6.10 Breastfeeding, Type of Birth and Events Following Discharge – A Significant Statistical Finding

6.10.1 Breastfeeding Satisfaction

Satisfaction is a complex concept with emotional and psychological components, which Linder-Pelz (1982) defines as a "positive attitude" (p. 578). Several authors (Dennis, 1999; Ertem et al., 2001; Janke, 1988; Kearney et al., 1990; Papinczak & Turner, 2000; Tarkka et al., 1999) have reported that breastfeeding duration can be affected by emotional and psychological variables.

In the current study the overall satisfaction rate with the breastfeeding experience was high and equally distributed between both sub-samples by birth type and breastfeeding at four months postpartum. There was a highly statistical significant association (p <.0005*) between satisfaction and breastfeeding at four months. These results provide us with an inference that being satisfied with breastfeeding experience is associated with increased breastfeeding duration. There are likely to be a number of intertwining factors concerning birthing, breastfeeding, the mother's own health, her infant's health and behaviour, parenting skills, and social and motivational factors which contribute to a mother's feelings of satisfaction concerning her breastfeeding experience: these factors were not examined in the current study.

6.11 Breastfeeding, Type of Birth and Antenatal Experiences – Non Significant Statistical Findings

6.11.1 Breastfeeding Intention

Chapter Five reports that 70% of the respondents intended to breastfeed for over six months with a further 16% stating they intended to breastfeed between three and six months (see p. 78/79). The remainder were not sure how long they intended to breastfeed. The percentages were fairly equally divided between the two sub-samples. Intention to breastfeed has been associated with increasing breastfeeding duration (Lawson & Tullock, 1995) because intention is purported to demonstrate motivation and commitment (Dennis, 1999; Ertem et al., 2001; Fetherston, 1995; Hewat & Ellis, 1986; Janke, 1988; Kearney et al., 1990). The respondents' intention to fully breastfeed closely matched the percentage fully breastfeeding at four months postpartum. This gives weight to the notion that breastfeeding intention is positively linked to breastfeeding duration.

6.11.2 Parity

There was no significant statistical association found between parity and breastfeeding duration in the current study. The effect of increasing parity on breastfeeding duration has not been clearly established in the literature. Increasing parity has been positively associated with breastfeeding duration (Ford & Labbok, 1990), been negatively associated with breastfeeding duration (Bick et al., 1998), or not influential in breastfeeding duration (Clements et al., 1997; Ekström et al., 2003; Ford et al., 1994; Scott & Binns, 1999). The high percentage (81%) of primigravidae breastfeeding at

four months postpartum could have multiple explanations, which were not examined in the current study.

6.12 Breastfeeding, Type of Birth and Birth Events and Experiences – Non Significant Statistical Findings

In the current study no significant statistical relationship was found between type of birth, breastfeeding duration and the following birth events and experiences: administration of oxytocin to induce or augment labour, having laboured or the length of the labour, use of analgesia in labour, type of anaesthetic used, and type of caesarean section. Each of these aspects is discussed in the following section.

6.12.1 Receiving Oxytocin in Labour

Oxytocin for the induction of, or augmentation of, labour was limited to those respondents having an unplanned caesarean section (n = 20). There was no significant statistical association found with breastfeeding at four months postpartum. These findings are limited because receiving oxytocin for management of the third stage was not assessed in the current study.

6.12.2 Labour and Length of Labour

There was no evidence found in the current study that labour, or the length of the labour, had any significant statistical association with breastfeeding duration. Long labour has been found by Chen et al., (1998) to be a risk factor for delayed lactogenesis and thus potentially for breastfeeding duration. The percentage of the respondents in

the current study who had a long labour by Chen et al's., measure of 11.5 $\pm$ 8.4 hours for a normal birth and 14.3 $\pm$ 4.9 for caesarean section was small (3% in the NB & 14% in the LSCS sub-samples).

6.12.3 Narcotic Analgesia during Labour

The administration of narcotic analgesia in labour in the current study was only identified as that being given in the last two hours of that labour. The presence of fentanyl analgesia in the epidural anaesthetic was also not determined in the current study. It is known that the administration of fentanyl as part of an epidural anaesthetic is common practice for maternity care in the HBDHB (C. Brogan, September 16, 2003, personal communication). The effect of fentanyl in regional anaesthetics on breastfeeding in the current study was not assessed. Radzyminski (2003) does suggest that there is no difference in breastfeeding behaviours between unmedicated mothers, and those who received epidural anaesthetic containing low doses of fentanyl.

Just two respondents in the total sample were identified as having narcotic analgesia, either intravenously or intramuscularly in the last two hours of labour. Because of the limitations of collection of the data concerning narcotic administration in labour it is difficult to assess the influence narcotic analgesia could have had on breastfeeding duration. The high percentage of the women in the LSCS sub-sample breastfeeding at four months postpartum suggests that any influence was minimal.

The question is: Why the women in the unplanned LSCS sub-sample did not receive narcotic analgesia prior to delivery? It may be speculated that reasons include: women elected not to have analgesia prior to the decision for unplanned caesarean section; the

need for an unplanned caesarean section overtook any requirement for narcotic analgesia; regional anaesthesia could have been the preferred option for first stage labour pain management, by both the mother and the healthcare practitioners, as is suggested by Enkin, et al., (2000).

6.12.4 The Effect of Regional or General Anaesthetic

The type of anaesthetic administered for caesarean section was not significantly statistically associated with breastfeeding at four months postpartum. Research that supports the current study's findings includes that of Halpern et al., (1999), Riordan et al., (2000), and Sepkoski et al., (1992), although Crowell et al., (1994) and Walker (1997) suggest that some babies are detrimentally affected by epidural medications. General anaesthetic has been reported as having more effect than regional anaesthetic on breastfeeding success (Halpen et al., 1999; Lie & Juul 1988) because a general anaesthetic usually limits mother-baby contact immediately following birth (Enkin et al., 2000). In the current study, however, the five respondents who had a general anaesthetic were breastfeeding at four months postpartum.

6.13 Breastfeeding, Type of Birth and Immediate Postpartum Events and Experiences – Non Significant Statistical Findings

In the current study no significant statistical relationships were found between birth type, breastfeeding duration and: receiving postoperative narcotic analgesia, the baby's behaviour at the initial feed, breastfeeding frequency in the first two days, when the mother perceived her milk 'came in' and when the baby started to feed well. Each of these aspects is discussed in the following section.

6.13.1 Receiving Postpartum Narcotic Analgesia

All except one woman, who received narcotic analgesia postpartum, were in the LSCS sub-sample. The finding of no significant statistical relationship between receiving post-operative narcotic analgesia within two hours of birth and breastfeeding at four months postpartum does not reflect prior studies that identify receiving postoperative analgesia as a barrier to successful breastfeeding (Arora & Gupta, 1990; Banapurmath & Selvamuthukumarasamy, 1995a; DiMatteo et al., 1996; Kapil et al., 1992; Kearney et al., 1990).

There were a small number (n = 7) of respondents in the caesarean section sub-sample who did not appear have their postoperative pain managed with narcotic analgesia. There are competing explanations as to why mothers might not have had narcotic analgesia postoperatively and include: inadequate therapeutic management of postoperative pain; a belief by some respondents that opiate analgesia would transfer to their baby with detrimental consequences; respondents were receiving adequate non-opiate analgesia; respondents were free of significant pain; the information was not correctly collected by the researcher: or the information was not correctly recorded in the mothers' clinical records.

Comments made by the respondents, however, indicate they felt that they were either denied effective analgesia, or, they avoided taking 'strong' pain relief because of possible detrimental effects of the medication on their breastfeeding infant. For instance Respondent 26 stated, "...I also believe my baby was affected by the drugs directly, or by my pain", and Respondent 39 had a similar view:

> The first week after the birth [I was] uncomfortable [in pain] and the physical demands of trying to latch her on correctly was hard and trying. Also the only

> pain relief given because of breastfeeding is paracetamol! Not hugely effective when you've just had moderate surgery.

Respondent 17 commented, "the physical act of feeding and caring for your baby can be hard, also a fear/worry of the drugs being carried through breast milk. You can put up with a lot of pain, as you have to feed".

Analgesia is not contraindicated during breastfeeding (Hale, 2002). Therapeutic uses of postoperative analgesia would reduce physical discomforts and increase mobility, and thus support maternal-infant contact, promoting breastfeeding success (Gorrín-Peralta & Parrilla-Rodríguez, 2000).

6.13.2 The Baby's Behaviour at the Initial Feed

In the current study type of birth and baby's behaviour at the first feed was not related to breastfeeding duration. Furthermore type of birth and baby behaviour at the first feed were not significantly statistically associated. The majority in both sub-samples reported their baby fed well, or sucked briefly at the first feed. Successful feeding behaviour promotes the relationship between the mother and baby (Tarkka, et al., 1998), and thus promotes breastfeeding success. The babies in the current study were healthy and full term with the LSCS sub-sample having very limited exposure to narcotic analgesia in the last two hours in labour, although the babies' exposure to fentanyl during regional anaesthetic is unknown.

6.14 Breastfeeding, Type of Birth and Immediate Postpartum Events and Experiences – Non Significant Statistical Findings

In the current study no significant statistical relationships were found between birth type, breastfeeding duration and; breastfeeding frequency in hospital, maternal perception of onset of lactation and when the baby started to feed well. Each of these aspects is discussed in the following sections.

6.14.1 Breastfeeding Frequency in Hospital

There was no significant statistical relationship between type of birth and frequency of baby feeding in the first two days in all categories specified in the current study. Nor was there a significant statistical association between feeding frequency and breastfeeding four months postpartum. This is a finding that has support from other research (Aliperti & MacAvoy, 1996; Hewat & Ellis, 1986).

6.14.2 Maternal Perception of Timing of Onset of Lactation

The focus of this question was the mothers' perception of the time their milk 'came in' as delayed lactation has been associated with shorter breastfeeding duration (Chapman & Pérez-Escamilla, 1999a; Tarkka et al., 1998). This study found that the majority of women in both sub-samples reported lactation onset after two days (see p. 94/95). Chapman and Pérez-Escamilla, (1999a) and Vertermark et al., (1990) support the current study's finding for the respondents in the Caesarean section sub-sample while Kulski and Hartmann (1981) and Kulski et al., (1981) suggest that two and a half days is the mean figure for milk to 'come in' for women having a caesarean section and

suggest a slightly shorter time for those having a normal birth. Chapman and Pérez-Escamilla (1999a) go further and suggest that if a mother's milk is not 'in' by three days postpartum, lactation onset delay can be considered. There was, however, no significant statistical association between type of birth, breastfeeding at four months postpartum and maternal perception of when her 'milk came in" in the current study, which is a finding supported by Vestermark et al., (1990) and Kulski et al, (1981). Increasing parity was not significantly statistically associated with the time the respondents felt their milk 'came in' in the current study.

6.14.3 When the Baby Started to Feed Well

There was no significant statistical relationship between type of birth, and when the baby started to feed well, nor breastfeeding at four months postpartum. While there are research studies (Kulski & Hartmann, 1981; Kulski et al., 1981), which provide evidence of the timing of lactation onset there is little written research evidence concerning a mother's view of when her baby started to feed well. The caesarean section respondents reported their baby began to feed well later than the normal birth mothers (see p. 99).

6.15 Breastfeeding, Type of Birth and Events Following Discharge from Hospital

The following section discusses three issues, which, while not essential to the study, provide additional information about breastfeeding in the population under study. The issues are; breastfeeding attrition rates of the total sample, the reasons the women gave for breastfeeding cessation and the effect on breastfeeding of a woman's intention to return to work.

6.15.1 Breastfeeding Attrition Rates over Time

Breastfeeding attrition rates in the total sample were low until after the fifth month following birth when a steady decline occurred. Just over a third of the respondents' were breastfeeding one year after birth.

6.15.2 Reasons for Stopping Breastfeeding

Multiple reasons that have been previously identified by others (Cooke et al., 2003; Essex, et al., 1995; Gunn, 1984; Lowe, 1988; Stamp & Crowther, 1995; Vogel et al., 1999) were given for breastfeeding cessation in the current study. In the current study there were small percentages of respondents who weaned for the commonly reported breastfeeding management problems such as poor milk supply, pain and discomfort, sore or cracked nipples, and mastitis, but a quarter of the respondents reported weaning for unspecified reasons. Weaning for unspecified reasons suggests that many of respondents were breastfeeding older babies and were planning to cease breastfeeding in a timely manner as opposed to early and unintentional weaning.

Women's comments provide some evidence for this view: "Breastfed both my children till 15 months. I wanted to stop, they [the baby] didn't. ..." (Respondent 145), and: "Baby wasn't sleeping at night and wanted comfort feeding to stay settled – became too disruptive for the rest of the family – baby was 15 months old" (Respondent 56).

6.15.3 Education Levels

The study found no statistical significant association between education level and breastfeeding at four months postpartum. The education levels of the study samples have been described in detail in Chapter Four page 66. Almost 61% of the respondents had education over high school level. Several authors (Ceriani Cernadas, Noceda, Barrera, Martinez & Garsd, 2003; Clements et al., 1997; Ford & Labbok, 1990; Heath, et al., 2002; Lawson & Tulloch, 1995; Scott & Binns, 1999; Vogel et al., 1999) have reported higher education to be a positive factor in breastfeeding duration. Others (Ekström et al., 2003; Ford et al., 1994) have reported there to be no association between levels of maternal education and increasing breastfeeding duration as found in the current study.

6.15.4 The Effect of Returning to Work

Returning to work has been associated with early breastfeeding cessation (Bick et al., 1998; Kearney & Cronenwett, 1991), probably because, although combining breastfeeding and working is achievable, it is difficult (Galtry, 1995). Returning to work was not a leading reason given for breastfeeding cessation in the current study. There was some evidence that women who intended to return to work did so, as the total sample percentage of 32.7% responses for intending to return to work closely matched the number who actually returned to work (33.3%). Eleven percent (n = 17) of the total sample said that returning to work was the reason they ceased breastfeeding, although for perspective, 18.3% (n = 28) of the total sample returned to work by the baby's sixth month of life, and 25.5% (n = 39) ceased breastfeeding by six months.

6.16 General Comments

The current study did not endeavour to establish the relationship between birth type and initiation of, or short-term breastfeeding. There is evidence that suggests women are less likely to initiate breastfeeding following caesarean section than normal birth (Dennis, 2002; DiMatteo et al., 1996; Hirose et al., 1996; Janke, 1988; Mathur et al., 1993; Rajan, 1994; Tamminen et al., 1983). The established literature suggests that breastfeeding short-term continuance is also influenced by negative birth experiences, particularly caesarean section (Kroeger, 2004). The established breastfeeding literature further suggests that long-term breastfeeding is influence by other factors such as; maternal social support, maternal belief systems, professional healthcare support and interventions, and maternal motivation and commitment.

The current study, explored breastfeeding duration once breastfeeding had commenced. Caesarean section was not found to be a risk factor related to duration of breastfeeding in the current study. Other researchers support this finding (Clements et al., 1997; Datta, 1990; Janke, 1988; Kearney et al., 1990; Pérez-Escamilla et al., 1996; Vestermark et al., 1990).

Although many of the NB sub-sample in the current study faced breastfeeding challenges, those in the LSCS sub-sample had physical and emotional challenges as a consequence of their surgery, in addition to any breastfeeding challenges that arose. Women in the study provided glimpses into their experience of these challenges with their comments that give us insight into their feelings, attitudes and their response to the challenges they were faced with. Respondent 26 eloquently wrote:

> The caesarean coloured everything in those first few weeks. I was in pain and also sad at having 'failed' [at giving birth normally]. Astonished I didn't get PND [postnatal depression]. The unexplained pain came at any time and doubled me over. I was not confident to lift the baby and couldn't do anything but side feed him. My husband did everything else. I had a bloody awful unexplained pain for six weeks after the birth. Midwife and Dr didn't help, or seem to care. I also had a huge fluid shift which was uncomfortable as well, plus the pain of the wound. Obviously [I] couldn't lift my eight pound baby easily and he gained [weight] rapidly. ...Maternity unit was very busy and I had trouble getting anyone to help get me up or lift my baby. I gave up on the nurses and went home soon. Finally help came from [named people] at [named support service] after three and a half weeks. He was unsettled until then, might have got there sooner but couldn't drive. Felt better [at] approx six weeks.

There is a point of termination of any breastfeeding relationship and this is best for the mother-baby dyad when it occurs at a time of their choosing and is not related to birth, or due to early, supposedly, insurmountable breastfeeding problems. The question remains, what motivates women to continue breastfeeding when confronted with problems? The findings of the current study suggest that the challenges breastfeeding women, in the caesarean section sub-sample in particular, were facing were not the determining factor for breastfeeding cessation for many. DiMatteo et al., (1996) and Tamminen et al., (1983) agree, and suggest that once breastfeeding starts then the events surrounding birth do not affect length of feeding.

It might be speculated reasons for both sub-samples breastfeeding in equal and high percentages at four months postpartum include: breastfeeding being viewed by the sub-samples as the 'norm'; the findings were an artefact; a reflection of the population characteristics; or, there might have been something else going on. Are there other psychological and emotional responses at work for women who had breastfeeding challenges, particularly for those in the caesarean section sub-sample who endeavoured to succeed with breastfeeding as a way of compensating themselves and their babies for the loss of a desired birth as is suggested by Laufer (1990). Such psychological or emotional responses have been identified as: maternal motivation (Banapurmath &

Selvamuthukumarasamy, 1995b; Dennis, 1999; Ertem et al., 2001; Fetherston, 1995; Hewat & Ellis, 1986; Wambach, 1997), commitment (Janke, 1988; Kearney et al., 1990), or confidence (Dennis, 1999). Bottorff (1990, p. 210) describes the commitment to breastfeeding as "persistence in breastfeeding" (p. 201). Perseverance is a term used by Respondent 122. She wrote, "It takes perseverance and dedication and a supportive partner to get through the first few weeks. ...But ultimately it's up to the individual and their partner and their dedication to breastfeed their baby".

One further explanation of the high percentage of breastfeeding in the current study is that breastfeeding was embedded in mothering, and as such is the motivator for successful breastfeeding. It is likely that many of the explanations discussed above, as reasons for the high percentages of the respondents' breastfeeding at four months postpartum in the current study were in operation for the women in this study.

6.17 Discussion of the Fourth and Fifth Research Aims

The fourth research aim was to test the effectiveness of the BBEQ as a data collection instrument and the fifth was to test the effectiveness of the clinical data collection tool as suitable to rapidly record clinical data from a woman's maternity clinical record.

6.17.1 Discussion of the BBEQ

Discussion of the evaluation of the BBEQ occurred in Chapter Three (p. 58) and showed that the instrument was generally suitable for the purposes of data collection for the current study. That is, it gathered large amounts of data about women's birth and breastfeeding events and experiences.

Minor changes to the BBEQ would improve its data collection validity and reliability. Altering the introductory statement at the beginning of the BBEQ (depending on the sampling time period) would assist the respondents to identify the birth the study was interested in. Alternatively, if a bigger population were available for study then the problem of women having more than one birth in the study time period would be eliminated. Other minor wording adjustments were identified as being necessary for question clarity. Altering the age categories for the women to mirror those of the Ministry of Health (2003) *Report on Maternity: 2000 & 2001* would allow improved comparison with national breastfeeding statistics. Women had experiences they wished to relate and more space for comments should be provided.

The results show that even without the alterations to improve the BBEQ as identified above, the BBEQ was a reliable instrument for the collection of large amounts of data. With the incorporation of the minor alterations identified, the BBEQ could be usefully employed for future studies of a similar nature.

6.17.2 Discussion of the Clinical Data Collection Tool

The fifth aim was to trial the clinical data collection tool to determine its suitability to collect large amounts of clinical data quickly and reliably. The discussion of the development of the clinical data collection tool occurred in Chapter Three (p. 45). The instrument enabled the researcher to record the additional clinical data identified as relevant to the research, or to confirm information provided by the respondents. The format of the tool allowed minor alterations to occur when one additional variable was needed. The clinical data collection tool was suitable for the purpose for which it was designed, and could be usefully employed for future studies of a similar nature.

The clinical data collection tool was easy to use and meet the objectives of the study for collection of clinical data. The women's clinical data that was sought by the study could not always be identified in the clinical records, with the result that some of the clinical data was unavailable to the study. Identifying the time of first breastfeed after birth was the most difficult to achieve as the information was not recorded clearly in the majority of the women's clinical notes. The researcher abandoned the collection of the time of first breastfeed from the women's records early in the process because of difficulties in identifying the data in the clinical records.

6.18 Summary

The findings of the current study have been discussed in this chapter. The discussion included the relevance of the overall breastfeeding rates of the total sample and the two sub-samples in light of the available relevant New Zealand literature for breastfeeding duration.

Discussion has occurred concerning the single significant statistical relationship found between type of birth, breastfeeding at four months postpartum and having breastfed before. The discussion has otherwise focused on type of birth and the significant statistical events and experiences found in the study. These were: the time of first cuddle, concomitant skin-to-skin contact, time of first breastfeed, supplementary feeding in hospital, 'rooming in', receiving help in hospital, and finally having a breastfeeding problem in hospital. The relevance of the significant statistical relationship between type of caesarean section and breastfeeding at four months postpartum has also been discussed. Other significant statistical relationships found in the study have been discussed as appropriate in the relevant section. The current

study's findings have been discussed in light of the available relevant literature concerning breastfeeding and birthing. Finally discussion has occurred as to the effectiveness of the data collection tools developed for the current study.

Conclusions are drawn as to the relevance of the findings of the current study in Chapter Seven. The study limitations are acknowledged and recommendations for midwifery clinical practice, education and research, and concluding remarks are made.

CHAPTER SEVEN: CONCLUSIONS, LIMITATIONS, RECOMMENDATIONS AND CONCLUDING REMARKS

The purpose of the current study was to explore birth and breastfeeding events and experiences for any possible influence on breastfeeding duration. Two hypotheses were developed for the study (see p. 8). Both were rejected.

To answer the study question, a retrospective research approach was taken to collect the data, which formed the basis of the statistical analysis. Women who had given birth between May 1999 and August 2002 were recruited from the HBDHB Maternity Service database. The study had a normal birth respondent sub-sample of 68, and a caesarean section sub-sample of 85, making the total sample of 153 women.

This chapter presents the conclusions of the study, followed by the study limitations, and then the study recommendations for midwifery practice, education, and research. Concluding remarks complete this chapter.

7.1 Conclusions

As reported in Chapter Five the overall breastfeeding rate at four months postpartum was 87.6% with 44.4% in the NB and 55.6% in the LSCS sub-samples. Type of birth and breastfeeding at four months postpartum were not significantly statistically associated. One marginally significant statistical association was found between breastfeeding at four months postpartum, type of birth, and prior breastfeeding experience. Other significant statistical relationships were found between type of birth and a number of healthcare related events and experiences. Type of caesarean section

and breastfeeding at four months postpartum were also marginally significantly statistically associated. Quantitative data revealed that the hospital midwife was the person who provided the majority of breastfeeding support for women although there was qualitative data, which indicated women were receiving conflicting, or unhelpful, advice in some instances. Finally the limited qualitative data revealed that some of the respondents in the LSCS sub-sample had a negative perception of postoperative analgesia. The findings were reported in Chapter Five.

The conclusions, which have been drawn from the current study, are:

1. Women who had a caesarean section in the current study were no more likely to have ceased breastfeeding by the fourth month of the baby's life than women who had a normal birth.

2. The respondents in the LSCS sub-sample were more likely to be affected detrimentally because of birth and breastfeeding events and experiences, but there were no significant statistical associations found between these events or experiences and breastfeeding at four months postpartum.

3. The respondents who had a planned caesarean section were more likely than those who had an unplanned caesarean section to be breastfeeding at four months postpartum.

4. Respondents received most breastfeeding support from hospital-employed midwives. Thus these midwives are critical healthcare professionals for supporting breastfeeding women following the birth and during the time a woman is in hospital.

7.2 Limitations

7.2.1 The Nature of the Study

The study was limited by history, which is the "occurrence of external events that take place concurrently with the independent variables" (Polit & Beck, 2004, p. 213). There was an unquantifiable and reasonable probability that external events, both in health practice and maternity service delivery, could have changed over the course of the study. Changing events were known to include: midwives being more likely to keep the mother and infant together following caesarean section over the study period for the respondents' birth; the appointment of a breastfeeding coordinator; and the HBDHB starting to implement the *Baby Friendly Hospital Initiative* (World Health Organisation 1998) during the later stages of the study. Experiences could also be different for individual respondents, as well as between the sub-samples over the enquiry time.

The study was limited by the retrospective nature of the enquiry and the extended study time period for the respondents' birth. One of the consequences was that some of the participants had subsequent births from the one identified during the recruitment process.

The accuracy of women's recall may also limit the study findings (Bennett, 1985; Githens, Glass, Sloan & Entman, 1993; Harlow & Linet, 1989; Hewson & Bennett, 1987; Martin, 1987; Oates & Forrest, 1984; Simkin, 1992). There was, however, some verification of respondents' data during the clinical data collection process.

Further study limitations were centred on the data collection. These include: information was not sought as to why oxytocin was administered during labour; limited information was collected concerning the administration of narcotic analgesia in labour including the use of fentanyl as part of an epidural anaesthetic, information was not sought concerning the amount of, or the frequency of supplemental feeding an infant was given in hospital. The clinical data collection tool would have provided an appropriate way of ascertaining such information.

A larger study or a replicable study in a regional area with similar characteristics would strengthen confidence in the study's results and would improve generalisability. Without such checking there is limited applicability of the findings to other contexts.

7.2.2 The Nature of the Sample

Although the final sample is homogeneous in some aspects, it is not representative of the national childbearing population for age, education levels, or ethnicity. In particular there was an absence of respondents under 20 years of age. The sample did not reflect the ethnic composition of the regional area with a higher proportion of European respondents than Mâori. The study is limited by the exclusion of women with marginal, or no English language skills, and the over representation of European women.

7.2.3 Sampling Limitations

The study was limited by the ethical requirement (see p. 39) for the initial recruitment phase to be undertaken by a third person. This had the potential to introduce selection bias. Judgement was required when applying the inclusion and exclusion criteria to the

potential participant sampling list. Some judgement was also required when applying the randomisation process because there were duplicate names on the potential participant lists.

There were unequal numbers of participants for the two sub-samples available for selection. The study cannot guarantee the absence of sampling bias, or errors. A power analysis was not completed and may have placed the study at risk of type II errors (Polit & Beck, 2004).

7.2.4 Limitations of the Participants

Self-selection may have introduced selection bias as women with extreme views, or those highly motivated to succeed might have responded to the study mail-out. Just as women who were busy, or not highly motivated, chose not to respond.

There were a small number of respondents included in the study who did not entirely meet the eligibility criteria. A decision to include these respondents in the study was made by the researcher, following evaluation of the eligibility criteria that were not met and breastfeeding outcome.

7.3 Recommendations

As a result of, and underpinned by the outcomes of the current study, the following recommendations are made for midwifery clinical practice, research, and education.

7.3.1 Recommendations for Midwifery Practice.

The study identifies the following areas for midwifery practice:

- Midwives should recognise breastfeeding as part of the birthing continuum, and that breastfeeding success is supported by healthcare practices that occur following birth.

- Midwives should regard early concomitant skin-to-skin contact and early initiation of breastfeeding as normal (when circumstances permit), and these should be offered as standard care. Midwives should facilitate early concomitant skin-to-skin contact as a means of encouraging early initiation of breastfeeding for all women, with particular regard to women having caesarean section, both planned and unplanned.

- Midwives should have the technical expertise, clinical and communication skills and sensitivity to support women to breastfeed successfully thereby reducing the amount of conflicting advice the mothers receive.

- Midwives should continue to protect and support breastfeeding by providing care, which meets the recommendations in the WHO *Ten Steps to Successful Breastfeeding* document (World Health Organisation, 1989).

7.3.2 Recommendations for Research

The study identifies the following areas for further research:

- To answer the question; are women who have a caesarean section committed to breastfeeding because of their belief in the importance of breastfeeding, or does accomplishing breastfeeding mitigate a mother's perception that caesarean section, particularly unplanned, is a negative birth experience?

- To explore women's perceptions of the use of postoperative analgesia following birth (this area of study is drawn directly from women's comments concerning their understanding of possible harmful effects that analgesia might have on their breastfeeding baby).

- To explore midwives understanding of the benefits, or harmful effects, of postoperative analgesia on the breastfeeding infant.

- To explore women's perceptions of midwives' breastfeeding support in hospital (this area of study is drawn directly from women's comments concerning their comments that not all professional help was useful).

7.3.3 Recommendations for Midwifery Education

The study identifies the following areas for further midwifery education:

- That midwifery education facilitates the development of technical expertise, clinical and communication skills, and sensitivity, to support breastfeeding success.

- Evidence-based midwifery knowledge concerning optimal postoperative pain relief management, and its effect on the breastfed baby, should be included in the education of midwives.

7.4 Concluding Remarks

The research question and the aims of the study have been addressed in this chapter. The study has examined two sub-samples of women who gave birth, either by normal vaginal birth, or caesarean section, in a region of New Zealand. The results have been described, and the study explores women's prior breastfeeding experience, perinatal birth and breastfeeding events and experiences up to four months postpartum. Some general matters have been discussed including overall breastfeeding rates of the sample and the reasons for breastfeeding cessation. The BBEQ and the clinical data collection tool have been trialled.

In the current study, as others have reported, there was no evidence that the events and experiences women had in the perinatal period influenced breastfeeding duration once breastfeeding was commenced and established. The focus of the study was on the

influence events and experiences might have on the longer duration of breastfeeding between the two sub-samples of women rather than initiation and short-term breastfeeding. Research evidence suggests that long-term breastfeeding can be influenced not only by the type of birth and early experience that women have, but also by other factors such as professional healthcare support and intervention, maternal social support, motivation and commitment.

The researcher speculates that the high rates of breastfeeding in both sub-samples might be that women were committed to breastfeeding because of its importance. It is further speculated that women having a caesarean section, particularly an unplanned caesarean section, may have persevered with breastfeeding as a way of mitigating a negative birth experience. Laufer (1990) describe this as mothers being committed to breastfeeding "as way of compensating themselves and their babies for the loss of a normal birth" (p. 43).

The current study provides a snapshot of women's experiences of birth and breastfeeding in the Hawke's Bay region of New Zealand. The percentages of both sub-samples of women breastfeeding at four months postpartum are encouraging. The current study provides another small link in the chain of birthing and breastfeeding knowledge in New Zealand. The study has also generated questions that point the way for further research.

Positive healthcare practices and well informed midwives have the capacity to have a beneficial effect on mothers and babies in their care. Kroeger (2004, p. 205) suggest that "protecting the mother-baby continuum" by enhancing a woman's ability to "assume mothering and initiate breastfeeding" through the facilitation of concomitant

skin-to-skin contact and initiation of breastfeeding within the first half-hour of life in accordance with Step Four of the World Health Organisation/UNICEF (1989) *Ten Steps to Successful Breastfeeding* might be one of the most critical actions for breastfeeding success. Informed midwifery care should minimise the negative effects of unexpected birth and breastfeeding experiences and thus enhance the mother-baby relationship, particularly breastfeeding.

Taking cognisance of women's experiences allows midwifery practice to move forward. The relationship between the mother and baby are fundamental to the child's health and in some instances the baby's very survival. I have left the final word to Respondent 105 who had a caesarean section. She made the following poignant comment:

> In retrospect I feel I have made a very good 'starting foundation' for a close relationship with my second child because I breastfed her. I have had more contact with her, i.e. eye contact and physical cuddling while breastfeeding that I might have otherwise not had if I'd not breastfed her or breastfed her for only a short period. ...I didn't feel I'd given birth to her but had been shopping and just picked her up from the supermarket. Breastfeeding, I feel, definitely helped me bond with her as I couldn't handle hearing her cry as much as I could tolerate my older child's cry when she had been a baby...".

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Appendix I

Questionnaire

Breast Feeding Questionnaire

Your baby must be at least 4 months (16 weeks) old when you answer the questionnaire

Please tick the best answer and add comments if you wish.

Part A: *Birth and Breastfeeding experience*

1. Have you breastfed before this baby?

- ☐ Yes
- ☐ No

2. If so, for how long?

- ☐ Less than 1 month
- ☐ 1 – 3 months
- ☐ Between three months and up to six months
- ☐ More than 6 months
- ☐ Still breastfeeding a child

The next questions are about your new baby

3. Please indicate the type of birth that you have had with this baby

- ☐ Normal (vaginal) birth
- ☐ Caesarean section (an operation)

4. How did you learn about breastfeeding?

- ☐ Antenatal /parenting classes
- ☐ Family/whanau
- ☐ Midwife
- ☐ Other_____

5. How did you plan to feed your baby?

- ☐ Fully breastfeed
- ☐ Combination feed (breastfeeding and bottle feeding formula)
- ☐ Formula feed
- ☐ I was not sure

6. **How long did you plan to breastfeed your baby?**

- ☐ Less than 1 month
- ☐ 1 – 3 months
- ☐ 4 - 6 months
- ☐ More than 6 months
- ☐ Not sure

7. **Did you intend to return to paid work after the birth?**

- ☐ Yes
- ☐ No

8. **If you have answered yes to the above question when did, or will you return to work after the birth?** _____

9. **Was a member of your family or a friend with you at the birth of your baby?**

- ☐ Yes
- ☐ No

10. **When did you first cuddle your baby?**

- ☐ Within one hour
- ☐ Within 2 hours
- ☐ Within 4 hours
- ☐ After 4 hours and up to 8 hours
- ☐ More than 8 hours

11. **Did you hold your baby naked against your skin after the birth?**

- ☐ Yes
- ☐ No

When did your baby have his/her first breastfeed after the birth?

- ☐ Within 1 hour of your birth
- ☐ After 1 hour and up to 2 hours
- ☐ After 2 hours and up to 4 hours
- ☐ After 4 hours and up to 8 hours
- ☐ Over 8 hrs

13 How did your baby breastfeed the first time?

- ☐ Sucked for a long time
- ☐ Sucked briefly
- ☐ Nuzzled/latched at my breast but did not suck
- ☐ Did not latch or suck at all

14 How often did your baby breast-feed in the first 2 days?

- ☐ Every 1 – 2 hours
- ☐ Every 2 - 3 hours
- ☐ Every 3 - 4 hours
- ☐ Every 5 to 6 hours
- ☐ My baby had breaks of more then 6 hours most of the time
- ☐ A mixture. Please describe how it was for you and your baby.

_____

_____

15. Did your baby have any feeds of formula or boiled water in hospital?

- ☐ Yes
- ☐ No
- ☐ Don't know

16. Was your baby with you in your room all the time in the hospital?

- ☐ Yes
- ☐ Most of the time
- ☐ Some of the time
- ☐ Not at all

17. When did your milk come in?

- ☐ Less than two days after the birth
- ☐ Between two and five days
- ☐ After 5 days

18. Did someone help you with breastfeeding while you were in hospital?

- ☐ Yes
- ☐ No

19. If yes who helped (Your own Midwife or Doctor [Lead Maternity Carer], hospital midwife/nurse, family, friends)?

_____

20 Did you have any problems with breastfeeding while you were in hospital?

- ☐ Yes
- ☐ No

21. If yes what were the problems? Please tick any that apply to you.

- ☐ Fixing baby to the breast
- ☐ Engorgement (very sore, full breasts)
- ☐ Low milk supply
- ☐ Pain /discomfort
- ☐ Nipple problems
- ☐ Other problems

Comments:_____

_____

_____

_____

_____

22 When did your baby start to breastfeed well?

- ☐ Within the first 3 days after the birth
- ☐ After 3 days and by day 5 after the birth
- ☐ After 5 days and by day 10 after the birth
- ☐ After day 10 and by 1 month old
- ☐ Never fed well

Comments_____

_____

_____

_____

23 How long were you in hospital for?

- ☐ Left before 24 hours (first day)
- ☐ Left after 24 hours and before 48 hours (second day)
- ☐ Left on day 3.
- ☐ Left on day 4
- ☐ Left on day 5
- ☐ Stayed longer then 5 days. Please state how many days you stayed

_____

These questions are about your breastfeeding after you left hospital.

24 If you had a caesarean (baby born by operation) birth, do you think it has had an effect on your ability to breastfeed your baby?

- ☐ Yes
- ☐ No

If yes, in what way(s)? _____

_____

_____

25 If you have breastfed after a normal (vaginal) birth and this time have had a caesarean, was there a difference in the breastfeeding experience?

☐ Yes
☐ No

Comments_____

_____

26 Are you or were you breastfeeding this baby when he/she was 4 months old?

☐ Yes
☐ No

27. Which of the following would best describe your breastfeeding when your baby was 4 months old?

☐ Breastfeeding only
(only breast milk and medicines have been given from birth).
☐ Breastfeeding plus water and medicines.
☐ Mostly breastfeeding but an occasional formula feeding
(1 bottle of formula a day).
☐ Mixed breastfeeding and formula feeding
(more then 1 bottle of formula a day).
☐ Occasional breastfeeding and formula feeding
(most feeds are formula bottle feed with only 1 breastfeed a day).

28. If you are no longer breastfeeding your baby why did you stop? Please tick as many of these that applied to you.

☐ Sore/cracked nipples
☐ Sore breasts
☐ Mastitis (breast infection)
☐ Baby didn't feed well
☐ Pain /discomfort
☐ Tiredness
☐ Return to work
☐ Poor milk supply
☐ Lack of support
☐ Didn't like breastfeeding
☐ Baby decided to wean
☐ Other (Please Comment) _____

29. If breastfeeding has stopped when did you stop breastfeeding?

- ☐ Within the first week after the baby's birth
- ☐ Within the 2nd week after the baby's birth
- ☐ In the 3rd or 4th week after the baby's birth
- ☐ In the second month
- ☐ In the 3rd month
- ☐ After the third month or more.
- ☐ Still feeding at _____ months

Please state how long you breastfeed for. _____

30. Who has supported you with your breastfeeding the most?

- ☐ Partner
- ☐ Midwife/s
- ☐ Nurse
- ☐ Family/whanau
- ☐ Friends
- ☐ GP
- ☐ Obstetrician (Doctors who specialized in women's health and babies).
- ☐ Support groups
- ☐ Other _____

31. Overall, are you satisfied with your breastfeeding experience?

- ☐ Yes
- ☐ No

Comments_____

_____

_____

_____

_____

Part B: Personal information

32. What is your age?

- ☐ Under 20 years
- ☐ 20–24 yrs
- ☐ 25-34 years
- ☐ 35 –49 years

33. What is your highest education qualification?

- ☐ No formal qualification
- ☐ High school qualification
- ☐ Certificate or diploma
- ☐ University degree
- ☐ Other (please state) _____

34. Which ethnic group(s) do you identify with?

- ☐ New Zealand Maori
- ☐ New Zealand European
- ☐ Other European
- ☐ Samoan
- ☐ Cook Island Maori
- ☐ Tongan
- ☐ Niuean
- ☐ Chinese
- ☐ Indian
- ☐ Other (please state) _____

35. How many children have you given birth to?_____

36. What was the date of the baby's birth that you have been telling us about in this questionnaire _____

37. Please state your current occupation (your job): _____

Thank you for completing this survey

Appendix II

Clinical Data Collection Tool

Breastfeeding clinical record data collection tool

		Crit 38	Crit 39	Crit 39	Crit 39	Crit 39	Crit 39	Crit 39	Crit 40	Crit 41	Crit 42	Crit 43	Crit 44	Crit 45	Crit 46	Crit 47	Crit 48
Identification number	Consent form signed **Yes / No**	Days in hospital Pre delivery	**Elective LSCS**	**Emergency** LSCS	LSCS **Epidural**	LSCS **Spinal**	LSCS **G A**	LSCS **combination**	Length of labour	Opiate pain relief within 2 hours of Birth **Yes/no**	Opiate Pain relief **Yes IV or IM**	Oxytocin in labour. **Yes/no**	opiate following Birth **yer /no**	Route of administration of opiate following Birth	**Baby weight In grams**	Apgar score at 1 minute	Time of first breast feed after birth in minutes
1.																	
2.																	
3.																	
4.																	
5.																	
6.																	

Appendix III

Invitation to Participate Letter

Massey University
COLLEGE OF HUMANITIES & SOCIAL SCIENCES

School of Health Sciences
Private Bag 11 222,
Palmerston North,
New Zealand
Telephone: 64 6 356 9099
Facsimile: 64 6 350 5668

Annette Hagan
Nursing Lecturer
Eastern Institute of Technology
Hawke's Bay, TARADALE
Ph (06) 844 8710 ext 5415
Email ahagan@eit.ac.nz

Kathy Manhire
Nursing Lecturer
Eastern Institute of Technology
Hawke's Bay, TARADALE
PH (06) 844 8710 ext 5415
Email kmanhire@eit.ac.nz

Cheryl Benn
Associate Professor
School of Health Sciences
Private Bag 11 22 Massey University
Ph (06) 350 5799 ext 2543
Email C.A.Benn@massey.ac.nz

20 September 2002

An examination of birth and breastfeeding events and their influence on breastfeeding duration.

Dear Mother

Our names are Annette Hagan and Kathy Manhire and we are nursing lecturers, midwives and breastfeeding (lactation) consultants. We are doing a research project as part of our Masters' study at Massey University. The research aims to find out whether the length of time women breastfeed is affected by the type of birth she has, for instance caesarean section or a normal birth. The information we collect will benefit women because it will allow midwives and doctors to plan maternity care for women who have had a caesarean section in a way that gives mothers and babies the best breastfeeding start possible.

We are aware that some families have had a change in circumstances since their baby was born. It may mean that they would not want to take part in the research. We have taken steps to identify these families to avoid including them. We recognise that we may unintentionally include families with altered situations in our mail out and apologise if receiving this letter causes anyone any distress.

We value your comments and should you either wish to talk to the researchers or take part in the research we would welcome your participation.

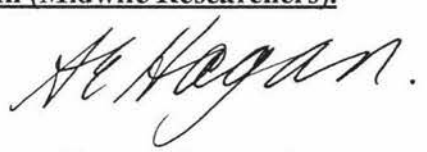
Your name has been randomly selected from the list of women who gave birth in Hawke's Bay District Health Board Health Care Services between early 1999 and July 2002. If you agree to take part in this research we will ask you to answer a few questions about your birth and breastfeeding experience in a self-administered questionnaire. We would also like to collect some details about your baby's birth from your hospital notes with your consent.

The questionnaire will take no more than 15 minutes to complete, and all the responses will remain confidential.

If you think you would like more information or would like to take part in this research project, could you please put your name and address on the enclosed response slip and return it in the reply paid envelope, which is attached.

Thank you for taking the time to read this letter and we look forward to hearing from you.

Kathy Manhire and Annette Hagan (Midwife Researchers).



This project has been reviewed and approved by the following ethics committees; Massey University Human Ethics Committee PN Protocol 02/60. If you have any concerns about the conduct of this research, please contact Professor Sylvia V Rumball, Chair, Massey University Regional Human Ethics Committee: Palmerston North, telephone 06 350 5249, Email S. V. Rumball@massey.ac.nz
Hawke's Bay Ethics Committee Ref HWB/02/05.09. If you have any queries or concerns regarding you rights as a participant in this study you may wish to contact a Health and Disability Advocate, telephone: 0800 42 36 38

✂_____

Annette Hagan
Nursing Lecturer
Eastern Institute of Technology Hawke's Bay,
Private Bag 1201
TARADALE
Ph (06) 844 8710 ext 5415
Email ahagan@eit.ac.nz

☐ I would like more information about the breastfeeding research study.

My name is _____

Address _____

_____

_____

_____

Appendix IV

Letter of support; Manager of Maternity Services, Hawke's Bay District Health Board

2 September 2002

Dear Mother,

Hawke's Bay District Health Board Maternity Services supports the proposed research project to be carried out by Annette Hagan and Kathy Manhire.

On behalf of Maternity Services I wish to extend to you an invitation to be part of this very important research. No identifying details will be used.

The outcomes and findings of the research will be formulated into recommendations that will be used to improve the quality of support and information about breastfeeding.

Your thoughts, opinions and comments will provide valuable relevant information that will be shared with significant staff.

We look forward to your participation and to sharing with you the findings and recommendations of the research.

Yours sincerely,

Helen Christie

Helen Christie
MANAGER MATERNITY AND SEXUAL HEALTH SERVICES

MATERNITY AND SEXUAL HEALTH SERVICES
Healthcare Services of Hawke's Bay District Health Board

Hawke's Bay Hospital, Omahu Road, Private Bag 9014, Hastings, New Zealand
Telephone: (06) 878 8109 Fax: (06) 878 1356
Email: helen.christie@hawkesbaydhb.govt.nz

Appendix V

Research Participant Information Sheet

Massey University
COLLEGE OF HUMANITIES & SOCIAL SCIENCES

School of Health Sciences
Private Bag 11 222,
Palmerston North,
New Zealand
Telephone: 64 6 356 9099
Facsimile: 64 6 350 5668

Participant Information Sheet.

An examination of birth and breastfeeding events and their influence on breastfeeding duration.

Kia Ora

You are receiving this because you have indicated an interest in being part of this study, which is looking at whether the length of time women breastfeed is affected by the type of birth they had.

Annette and I are asking you to agree to take part in this research by completing the enclosed consent form and then the questionnaire.

This research is being carried out in conjunction with Massey University, Palmerston North and forms a component of our Masters in Midwifery at Massey University. We are both Registered Nurses and Midwives and have an international breastfeeding qualification (IBCLC). We are currently working as Nursing Lecturers at the Eastern Institute of Technology Hawke's Bay.

Background to the study

Caesarean sections are increasing in New Zealand. Our breastfeeding rates are dropping. We want to find out if there is a connection between the increasing number of caesarean sections and the drop in breastfeeding rates and what affect, if any, caesarean section has on breastfeeding.

About the study

The study involves you:

1. Signing the consent form included in this package and returning it in one of the two stamped addressed envelopes we have provided.

2. Completing the questionnaire, which will provide us with information about your baby's birth and breastfeeding experience. This should take you about 30 minutes. You then posting it back to us in the second stamped addressed envelope we have provided.

3. Giving us permission to gather some information from your hospital notes about your type of birth, whether you were given any anaesthetic, what, if any, pain relief you had and some information about your baby such as his/her weight and condition at birth. You need to give us permission to do this by signing the consent form in the appropriate place.

If you consent to be part of this study you have the right to:

- Decline to answer any questions
- Withdraw from the study at any time
- Ask any questions about the study at any time
- Provide information on the understanding that your name will not be used unless you give your permission to the researcher.
- Receive a summary of the findings of the research when it is finished.

How will the study be helpful?

By exploring women's experiences of breastfeeding we might be able to suggest different ways Midwives and Doctors could better support new mothers and their babies with their birth and early breastfeeding experiences.

What happens with the information we collect?

- Your personal details will be kept separate from your questionnaires.
- We have used a number code on the questionnaires to identify your questionnaire should you decide later that you do not want to continue in the project. The codes will also allow us to add your chart review data to your questionnaire.
- All work to do with the research done on a computer will be non-identifiable and will only be accessible by the researchers using a confidential password.
- All your personal details, questionnaires and chart review material will be destroyed after 5 years.
- The researchers will use the information to write a final report as part of their Masters of Midwifery degree and may use parts of the report for other publications, and presentations at conferences and seminars.

What will happen when the project is finished?

- The researchers provide a written summary of the findings of the research.
- The researchers will write a report on the research.
- Parts of the research will be published in a professional journal and presented at a conference.

If you have any questions or comments please contact any of us:

Annette Hagan or Kathy Manhire
Faculty of Sports and Health Science
Eastern Institute of Technology Hawke's Bay
Private Bag 1201
TARADALE

Phone 06 844 8710 Extension 5415
Email Kmanhire@eit.ac.nz
Ahagan@eit.ac.nz

Dr Cheryl Benn
Associate Professor
School of Health Sciences
Private Bag11 222
Massey University
PALMERSTON NORTH

Phone 06 350 5799 Ext 2543
Email: C.A.Benn@massey.ac.nz

This project has been reviewed and approved by the following ethics committees;
Massey University Human Ethics Committee PN Protocol 02/60. If you have any concerns about the conduct of this research, please contact Professor Sylvia V Rumball, Chair, Massey University Regional Human Ethics Committee: Palmerston North, telephone 06 350 5249, Email S. V. Rumball@massey.ac.nz
Hawke 's Bay Ethics Committee Ref HWB/02/05.09.
If you have any queries or concerns regarding you rights as a participant in this study you may wish to contact a Health and Disability Advocate, telephone: 0800 42 36 38

Appendix VI

Research Participant Consent Form

Massey University
COLLEGE OF HUMANITIES & SOCIAL SCIENCES

School of Health Sciences
Private Bag 11 222,
Palmerston North,
New Zealand
Telephone: 64 6 356 9099
Facsimile: 64 6 350 5668

September 20, 2002

An examination of birth and breastfeeding events and their influence on breastfeeding duration.

CONSENT FORM

I have read the information sheet and I have understood what this study is about. I have no unanswered questions and know I can contact either Annette Hagan or Kathy Manhire and ask any questions about the research if I wish.

I understand that I have the right to decline to answer any question or choose to withdraw from the research **at any time** and I can do this by contacting either of the researchers.

I agree to provide information on the questionnaire on the understanding that my name will not be used without my permission.

I give my consent for the researchers to access my chart for relevant information about my birth and early breastfeeding experience.

YES **NO**

Name: _____

Signed: _____ **Date:** _____

I would like a written summary of the findings **YES** **NO**

This project has been reviewed and approved by the following ethics committees; Massey University Human Ethics Committee PN Protocol 02/60. If you have any concerns about the conduct of this research, please contact Professor Sylvia V Rumball, Chair, Massey University Regional Human Ethics Committee: Palmerston North, telephone 06 350 5249, Email S. V. Rumball@massey.ac.nz
Hawke's Bay Ethics Committee, Ref HWB/02/05.09
If you have any queries or concerns regarding you rights as a participant in this study you may wish to contact a Health and Disability Advocate, telephone: 0800 42 36 38

Appendix VII

Research Information Sheet for Lead Maternity Carers

Massey University
COLLEGE OF HUMANITIES & SOCIAL SCIENCES

School of Health Sciences
Private Bag 11 222,
Palmerston North,
New Zealand
Telephone: 64 6 356 9099
Facsimile: 64 6 350 5668

Annette Hagan
Nursing Lecturer
Eastern Institute of Technology,
Hawke's Bay,
TARADALE
Ph (06) 844 8710 ext 5415
Email ahagan@eit.ac.nz

Kathy Manhire
Nursing Lecturer
Eastern Institute of Technology
Hawke's Bay,
TARADALE
Ph (06) 844 8710 ext 5415
Email kmanhire@eit.ac.nz

21st June 2002

Dear LMC,

Re: An examination of birth and breastfeeding events and their influence on breastfeeding duration research project.

We would like to advise you of this research project, which will be undertaken in this region over the latter part of 2002. We believe that this research is important, as there are no studies that specifically investigate the long-term effects of caesarean section and the health care practices associated with it, on breastfeeding duration.

The research forms part of our Masters in Midwifery, Massey University and has been developed in conjunction with Helen Christie, Manager, Hawke's Bay District Healthcare Maternity Services and wide regional consultation. It has been reviewed by and approved by the Hawke's Bay, Massey University, and EIT Hawke's Bay Human Ethics Committees.

The specific aims of this quantitative research are to:

1. To determine the number of women in the total study sample who are breastfeeding four months following the baby's birth.
2. To determine the number of women in the normal vaginal birth group who are breastfeeding four months following the baby's birth.
3. To determine the number of women in the caesarian section group who are breastfeeding four months following the baby's birth.
4. To examine and describe the significance of birth and breastfeeding events in the two groups and determine the significance of their effect on breastfeeding duration.

We will be inviting 500 women who have recently given birth in Hawke's Bay Hospital to take part. These women will be divided into two randomly selected groups of women; 250 of whom have had a normal vaginal birth and 250 who have had a caesarean section. Inclusion and exclusion criteria will be strictly applied.

Once women indicate an interest to participate they will be sent an eight-page questionnaire. The questionnaire will cover past birth and breastfeeding experience, current birth method, breastfeeding intentions and current experience, breastfeeding following discharge and some demographic data. This will be followed by a chart review with appropriate written consent.

The chart review will be specific. It will be used to clarify inclusion and exclusion criteria and confirm or determine the following clinical data: length of labour, type of caesarean, type of anaesthetic, use of opiate pain relief, oxytocin administration, baby weight Apgar score and time of first breastfeed.

The events in which we are particularly interested are; the pharmacological aspects of analgesia and anaesthetic, health care practices surrounding the birth and the support the mother has, initiation of feeding, feeding supplementation, and the physiological effects of surgery.

If you would like further information concerning this research project please contact us. We would be happy to provide copies of the questionnaire and chart review tool if you wish. We will also be happy to discuss the progress of the research and will be reporting our findings at the conclusion of the project.

Yours sincerely

A Hagan

Kathy Manhire

Annette Hagan
Kathy Manhire

This project has been reviewed and approved by the following ethics committees: Massey University Human Ethics Committee PN Protocol 02/60. If you have any concerns about the conduct of this research, please contact Professor Sylvia V Rumball, Chair, Massey University Regional Human Ethics Committee: Palmerston North, telephone 06 350 5249, Email S. V. Rumball@massey.ac.nz
Hawke's Bay Ethics Committee: Ref HWB/02/05.09

Appendix VIII

Research Invitation Reminder Postcard

Breastfeeding
Research
Project

Breastfeeding
Research
Project

Breastfeeding
Research
Project

Breastfeeding
Research
Project

Dear Mother

Date: 21 October 2002

Recently you received a letter inviting you to take part in our breastfeeding research project.

As we haven't heard back from you ,this card is to remind you that you still can be part of the project by returning the form attached to our letter in the stamped envelope we included.

You may also phone us on (06)9748000 ext 5145 for more information if you would prefer.

We look forward to hearing from you.

Reminder

Annette Hagan and Kathy Manhire

Dear Mother

Date: 21 October 2002

Recently you received a letter inviting you to take part in our breastfeeding research project.

As we haven't heard back from you ,this card is to remind you that you still can be part of the project by returning the form attached to our letter in the stamped envelope we included.

You may also phone us on (06)9748000 ext 5145 for more information if you would prefer.

We look forward to hearing from you.

Reminder

Annette Hagan and Kathy Manhire

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Date: 21 October 2002

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Reminder

Annette Hagan and Kathy Manhire

Dear Mother

Date: 21 October 2002

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As we haven't heard back from you ,this card is to remind you that you still can be part of the project by returning the form attached to our letter in the stamped envelope we included.

You may also phone us on (06)9748000 ext 5145 for more information if you would prefer.

We look forward to hearing from you.

Reminder

Annette Hagan and Kathy Manhire

Appendix IX

Research Participant Reminder Postcard

Dear Mother

Date: 25 October 2002

Recently you received a questionnaire to complete for our breastfeeding research project. As we haven't heard back from you, this card is to remind you that, you can still be part of the project by completing and returning the consent form and questionnaire in the stamped envelopes we included in our mail out.

You may also phone us on (06)9748000 ext 5145 for more information if you would prefer.

We look forward to hearing from you.

Reminder

Annette Hagan and Kathy Manhire

Dear Mother

Date: 25 October 2002

Recently you received a questionnaire to complete for our breastfeeding research project. As we haven't heard back from you, this card is to remind you that, you can still be part of the project by completing and returning the consent form and questionnaire in the stamped envelopes we included in our mail out.

You may also phone us on (06)9748000 ext 5145 for more information if you would prefer.

We look forward to hearing from you.

Reminder

Annette Hagan and Kathy Manhire

Dear Mother

Date: 25 October 2002

Recently you received a questionnaire to complete for our breastfeeding research project. As we haven't heard back from you, this card is to remind you that, you can still be part of the project by completing and returning the consent form and questionnaire in the stamped envelopes we included in our mail out.

You may also phone us on (06)9748000 ext 5145 for more information if you would prefer.

We look forward to hearing from you.

Reminder

Annette Hagan and Kathy Manhire

Dear Mother

Date: 25 October 2002

Recently you received a questionnaire to complete for our breastfeeding research project. As we haven't heard back from you, this card is to remind you that, you can still be part of the project by completing and returning the consent form and questionnaire in the stamped envelopes we included in our mail out.

You may also phone us on (06)9748000 ext 5145 for more information if you would prefer.

We look forward to hearing from you.

Reminder

Annette Hagan and Kathy Manhire

Appendix X

Hawke's Bay Ethics Committee Research Approval Letter

and Supplementary Letter

Hawkes Bay Ethics Committee

P.O. Box 5144
Greenmeadows
Napier
Phone/Fax (06) 844 0360
Email: HB.Ethics@xtra.co.nz

24 June 2002

Annette Hagan
26 Colenso Avenue
NAPIER

Dear Annette

RE: An exploration of birth and breastfeeding events and their influence on breastfeeding duration.
Primary Investigator: Annette Hagan, Lecturer Nursing Studies, EIT.
Our Ref: HWB/02/05.09

Thank you for your letter, amended information sheet, consent form, letter and questionnaire received on 10th June and your email received on 13th June 2002.

The Committee was happy to extend ethical approval of the study until 30 March 2004. The Hawke's Bay Ethics Committee will review the approved application in May of each year. It is your responsibility to forward a completed Progress Report before ethical review of the project. Failure to do so may result in withdrawal of ethical approval. A form to assist with this should come off our data base two months prior to the due date. The Hawke's Bay Ethics Committee will also require a report at the conclusion of the study. A form to assist with this is available from the administrator and will be forwarded to you.

The Committee did notice quite a few typos in the documents that you submitted and these are enclosed for your amendment. Approval by the Hawke's Bay Ethics Committee should also be included in the letter, information sheet and consent form. The advocacy statement should also be included in the information sheet. The standard statement reads:
If you have any queries or concerns regarding your rights as a participant in this study you may wish to contact a Health and Disability Advocate, telephone: 0800 42 36 38

We wish you every success with this study.

Yours sincerely

C C Mulholland

Christine Mulholland
ADMINISTRATOR

Enc:

Annette Hagan - Amended Letter - Approved

From: "Hawkes Bay Ethics Committee" <HB.Ethics@xtra.co.nz>
To: "Annette Hagan" <ahagan@eit.ac.nz>
Date: 18/09/2002 2:03 p.m.
Subject: Amended Letter - Approved

HWB/02/05/09: An exploration of birth and breastfeeding events and their influence on breastfeeding duration. Primary Investigator: Annette Hagan, Lecturer Nursing Studies, EIT, Taradale.

Hi Annette

Thank you for forwarding the minutes of the meeting held on 02.09.02 and the amended letter.

The Committee was happy to approve the amended letter.

Thank you for bringing this issue to the Committee and I hope that your research continues to go well.

Regards
Christine Mulholland
Administrator
Hawke's Bay Ethics Committee
P O Box 5144
Greenmeadows
Napier
Phone/Fax: 06 844 0360

Appendix XI

Massey University Human Ethics Committee

Research Approval Letter

Massey University Campus Human Ethics Committee: Palmerston North (HEC: PN)
Old Main Building, Turitea Fax: 64 6 350 5622 http://www.massey.ac.nz/~muhec

Professor Sylvia V Rumball, Chair Miss Karen A Kahukoti, Secretary
Telephone: 64 6 350 5249 Telephone: 64 6 350 5573
Email: S.V.Rumball@massey.ac.nz Email: K.A.Kahukoti@massey.ac.nz

Massey University

Private Bag 11 222,
Palmerston North,
New Zealand
Telephone: 64 6 356 9099

17 October 2002

Ms Annette Hagan
26 Colenso Avenue
NAPIER

Dear Annette

Re: HEC: PN Protocol – 02/60
An exploration of birth and breastfeeding events and their influence on breastfeeding duration

Thank you for your letter dated 11 October 2002 and the documentation.

The documents were noted.

Any departure from the approved protocol will require the researcher to return this project to the Massey University Campus Human Ethics Committee: Palmerston North for further consideration and approval.

Yours sincerely

Sylvia Rumball.

Professor Sylvia V Rumball, Chair
Massey University Campus Human Ethics Committee: Palmerston North

cc Associate Professor Cheryl A Benn
Health Sciences
TURITEA PN351

Appendix XII

Eastern Institute of Technology Research Ethics Committee Approval Letter

EIT HAWKE'S BAY

Te Whare Takiura o Kahungunu

4 June 02

A Hagan and K Manhire
Faculty of Health & Sport
EIT Hawke's Bay
Private Bag 1201
TARADALE

Dear Annette & Kathy

The Research Committee evaluated your research proposal on "An exploration of birth and breastfeeding events and their influence on breastfeeding duration", and I am pleased to inform you that it is approved.

You may be aware that as policy EIT does not approve research proposal for ethics in cases where a staff member studies from another credible institution. In this case, the Committee processed your application because you committed EIT to approve the proposal as well.

The Committee would like to wish the best with the project.

Ami Sundar (Dr)
RESEARCH CONVENOR

cc Susan Jacobs

Appendix XIII

Descriptive Statistical Frequencies

Frequency Table

Type of birth

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	normal	68	44.4	44.4	44.4
	LSCS	85	55.6	55.6	100.0
	Total	153	100.0	100.0	

Breastfeeding at 4 months

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	134	87.6	87.6	87.6
	no	19	12.4	12.4	100.0
	Total	153	100.0	100.0	

Mix of breastfeeding at 4 months

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Breastfeeding only	98	64.1	64.1	64.1
	Breastfeeding + water & medicine	18	11.8	11.8	75.8
	Mixed feeding	18	11.8	11.8	87.6
	Formula	19	12.4	12.4	100.0
	Total	153	100.0	100.0	

Parity

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	47	30.7	30.7	30.7
	2 or more	106	69.3	69.3	100.0
	Total	153	100.0	100.0	

Breastfed before

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	98	64.1	64.1	64.1
	no	55	35.9	35.9	100.0
	Total	153	100.0	100.0	

Prior length of breast feeding

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	< 1 month	5	3.3	3.3	3.3
	1 - 3 months	11	7.2	7.2	10.5
	3 - 6 months	18	11.8	11.8	22.2
	> 6 months	58	37.9	37.9	60.1
	still feeding	13	8.5	8.5	68.6
	never fed	48	31.4	31.4	100.0
	Total	153	100.0	100.0	

Learn about breastfeeding: antenatal/parenting class

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	mentioned	73	47.7	47.7	47.7
	not mentioned	80	52.3	52.3	100.0
	Total	153	100.0	100.0	

Learn about b/feeding: family/whanau

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	mentioned	53	34.6	34.6	34.6
	not mentioned	100	65.4	65.4	100.0
	Total	153	100.0	100.0	

Learn about b/feeding; midwife

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	mentioned	90	58.8	58.8	58.8
	not mentioned	63	41.2	41.2	100.0
	Total	153	100.0	100.0	

Learn about b/feeding; previous breastfeeding experience

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	75	49.0	49.0	49.0
	2	78	51.0	51.0	100.0
	Total	153	100.0	100.0	

Learn about b/feeding; other

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	mentioned	44	28.8	28.8	28.8
	not mentioned	109	71.2	71.2	100.0
	Total	153	100.0	100.0	

Baby feeding intention

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	fully breastfeed	140	91.5	91.5	91.5
	Combination feed	10	6.5	6.5	98.0
	Formula feed	1	.7	.7	98.7
	Not sure	2	1.3	1.3	100.0
	Total	153	100.0	100.0	

Intended length of breastfeeding

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	< 1 month	1	.7	.7	.7
	1 - 3 months	2	1.3	1.3	2.0
	3 - 6 months	24	15.7	15.7	17.6
	> 6 months	106	69.3	69.3	86.9
	not sure	20	13.1	13.1	100.0
	Total	153	100.0	100.0	

Intention to return to work

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	50	32.7	32.7	32.7
	no	103	67.3	67.3	100.0
	Total	153	100.0	100.0	

Baby age when returned to work

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	< 1 month	5	3.3	9.8	9.8
	During baby's 2nd month of age	4	2.6	7.8	17.6
	During baby's 3rd month of age	2	1.3	3.9	21.6
	During baby's 4th month of age	4	2.6	7.8	29.4
	During baby's 5th month of age	5	3.3	9.8	39.2
	During baby's 6th month	8	5.2	15.7	54.9
	Baby older then 7 months	22	14.4	43.1	98.0
	Not sure	1	.7	2.0	100.0
	Total	51	33.3	100.0	
Missing	System	102	66.7		
Total		153	100.0		

Baby first cuddle

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	within 1 hour	128	83.7	83.7	83.7
	1 - 2 hours	25	16.3	16.3	100.0
	Total	153	100.0	100.0	

Held baby skin-to-skin

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	56	36.6	36.6	36.6
	no	97	63.4	63.4	100.0
	Total	153	100.0	100.0	

Time of first feed 1/2

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Within first hour	102	66.7	66.7	66.7
	After first hour	51	33.3	33.3	100.0
	Total	153	100.0	100.0	

How baby feed first time

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	sucked for a long time	57	37.3	37.7	37.7
	sucked briefly	73	47.7	48.3	86.1
	Nuzzled/latched but didn't feed	14	9.2	9.3	95.4
	didn't latch or suck	7	4.6	4.6	100.0
	Total	151	98.7	100.0	
Missing	System	2	1.3		
Total		153	100.0		

How often did baby breastfeed in the first 2 days

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1-2 hours	36	23.5	24.0	24.0
	2 - 3 hourly	4	2.6	2.7	26.7
	3 - 4 hourly	73	47.7	48.7	75.3
	5 - 6 hourly	10	6.5	6.7	82.0
	mixture	27	17.6	18.0	100.0
	Total	150	98.0	100.0	
Missing	System	3	2.0		
Total		153	100.0		

Formula or water given in hospital

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	48	31.4	31.4	31.4
	no	100	65.4	65.4	96.7
	don't know	5	3.3	3.3	100.0
	Total	153	100.0	100.0	

Baby in room with mother

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	75	49.0	49.0	49.0
	most of the time	71	46.4	46.4	95.4
	some of the time	7	4.6	4.6	100.0
	Total	153	100.0	100.0	

When did the mothers milk come in

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	< two days	42	27.5	27.5	27.5
	2 - 5 days	103	67.3	67.3	94.8
	> 5 days	5	3.3	3.3	98.0
	Tandem feeding	1	.7	.7	98.7
	milk did not come in	2	1.3	1.3	100.0
	Total	153	100.0	100.0	

Breastfeeding help in hospital yes - no

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	124	81.0	81.0	81.0
	no	29	19.0	19.0	100.0
	Total	153	100.0	100.0	

Breastfeeding help in hospital LMC

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	mentioned	45	29.4	29.4	29.4
	not mentioned	108	70.6	70.6	100.0
	Total	153	100.0	100.0	

Breastfeeding help in hosp: hospital midwife/nurse

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	mentioned	111	72.5	72.5	72.5
	not mentioned	42	27.5	27.5	100.0
	Total	153	100.0	100.0	

Breastfeeding help in hosp: Family

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	mentioned	10	6.5	6.5	6.5
	not mentioned	143	93.5	93.5	100.0
	Total	153	100.0	100.0	

Breastfeeding help in hosp:friend/s

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	mentioned	5	3.3	3.3	3.3
	not mentioned	148	96.7	96.7	100.0
	Total	153	100.0	100.0	

Breastfeeding help in hosp: other

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	mentioned	5	3.3	3.3	3.3
	not mentioned	148	96.7	96.7	100.0
	Total	153	100.0	100.0	

Breastfeeding problem yes - no

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	102	66.7	66.7	66.7
	no	51	33.3	33.3	100.0
	Total	153	100.0	100.0	

Breastfeeding problems: fixing baby

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	mentioned	73	47.7	47.7	47.7
	not mentioned	80	52.3	52.3	100.0
	Total	153	100.0	100.0	

Breastfeeding problems: engorgement

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	mentioned	32	20.9	20.9	20.9
	not mentioned	121	79.1	79.1	100.0
	Total	153	100.0	100.0	

Breastfeeding problems: low milk supply

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	mentioned	15	9.8	9.8	9.8
	not mentioned	138	90.2	90.2	100.0
	Total	153	100.0	100.0	

Breastfeeding problems; pain or discomfort

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	mentioned	42	27.5	27.5	27.5
	not mentioned	111	72.5	72.5	100.0
	Total	153	100.0	100.0	

Breastfeeding problems; nipple problems

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	mentioned	50	32.7	32.7	32.7
	not mentioned	103	67.3	67.3	100.0
	Total	153	100.0	100.0	

Breastfeeding problems; other problems

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	mentioned	18	11.8	11.8	11.8
	not mentioned	135	88.2	88.2	100.0
	Total	153	100.0	100.0	

Time baby started to feed well

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	< 3 days	69	45.1	45.1	45.1
	3 - 5 days	33	21.6	21.6	66.7
	5 - 10 days	18	11.8	11.8	78.4
	>10 days	31	20.3	20.3	98.7
	more than a month	2	1.3	1.3	100.0
	Total	153	100.0	100.0	

Time in hospital

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	<24 hours	13	8.5	8.5	8.5
	24 - 48 hours	31	20.3	20.3	28.8
	day 3	20	13.1	13.1	41.8
	day 4	25	16.3	16.3	58.2
	day 5	43	28.1	28.1	86.3
	> 5 days	21	13.7	13.7	100.0
	Total	153	100.0	100.0	

Effect of LSCS on breastfeeding

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	22	14.4	25.0	25.0
	no	66	43.1	75.0	100.0
	Total	88	57.5	100.0	
Missing	System	65	42.5		
Total		153	100.0		

Reason for stopping: sore/cracked nipples

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	mentioned	8	5.2	5.3	5.3
	not mentioned	144	94.1	94.7	100.0
	Total	152	99.3	100.0	
Missing	System	1	.7		
Total		153	100.0		

Reason for stopping: mastitis

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	mentioned	5	3.3	3.3	3.3
	not mentioned	147	96.1	96.7	100.0
	Total	152	99.3	100.0	
Missing	System	1	.7		
Total		153	100.0		

Baby did not feed well

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	mentioned	11	7.2	7.2	7.2
	not mentioned	141	92.2	92.8	100.0
	Total	152	99.3	100.0	
Missing	System	1	.7		
Total		153	100.0		

Reason for stopping: pain discomfort

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	mentioned	10	6.5	6.6	6.6
	not mentioned	142	92.8	93.4	100.0
	Total	152	99.3	100.0	
Missing	System	1	.7		
Total		153	100.0		

Reason for stopping: tiredness

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	mentioned	22	14.4	14.5	14.5
	not mentioned	130	85.0	85.5	100.0
	Total	152	99.3	100.0	
Missing	System	1	.7		
Total		153	100.0		

Reason for stopping: return to work

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	mentioned	17	11.1	11.2	11.2
	not mentioned	135	88.2	88.8	100.0
	Total	152	99.3	100.0	
Missing	System	1	.7		
Total		153	100.0		

Reason for stoppning: poor milk supply

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	mentioned	28	18.3	18.4	18.4
	not mentioned	124	81.0	81.6	100.0
	Total	152	99.3	100.0	
Missing	System	1	.7		
Total		153	100.0		

Reason for stopping: lack of support

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	mentioned	3	2.0	2.0	2.0
	not mentioned	149	97.4	98.0	100.0
	Total	152	99.3	100.0	
Missing	System	1	.7		
Total		153	100.0		

Reason for stopping: didn't like breastfeeding

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	mentioned	11	7.2	7.2	7.2
	not mentioned	141	92.2	92.8	100.0
	Total	152	99.3	100.0	
Missing	System	1	.7		
Total		153	100.0		

Reason for stopping: baby self weaned

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	mentioned	28	18.3	18.4	18.4
	not mentioned	124	81.0	81.6	100.0
	Total	152	99.3	100.0	
Missing	System	1	.7		
Total		153	100.0		

Reason for stopping: other

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	mentioned	45	29.4	29.6	29.6
	not mentioned	107	69.9	70.4	100.0
	Total	152	99.3	100.0	
Missing	System	1	.7		
Total		153	100.0		

When breastfeeding stopped

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	<1 week	2	1.3	1.3	1.3
	3 - 4 week	5	3.3	3.3	4.7
	2nd month	7	4.6	4.7	9.3
	3rd month	6	3.9	4.0	13.3
	4 month	11	7.2	7.3	20.7
	5 month	8	5.2	5.3	26.0
	6 - 9 months	39	25.5	26.0	52.0
	10 - 12 months	15	9.8	10.0	62.0
	> 1yr	57	37.3	38.0	100.0
	Total	150	98.0	100.0	
Missing	System	3	2.0		
Total		153	100.0		

Partner

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	mentioned	97	63.4	63.4	63.4
	not mentioned	56	36.6	36.6	100.0
	Total	153	100.0	100.0	

Midwife/s

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	mentioned	71	46.4	46.4	46.4
	not mentioned	82	53.6	53.6	100.0
	Total	153	100.0	100.0	

Nurse

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	mentioned	10	6.5	6.5	6.5
	not mentioned	143	93.5	93.5	100.0
	Total	153	100.0	100.0	

Family/whanau

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	mentioned	46	30.1	30.1	30.1
	not mentioned	107	69.9	69.9	100.0
	Total	153	100.0	100.0	

Friends

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	mentioned	23	15.0	15.0	15.0
	not mentioned	130	85.0	85.0	100.0
	Total	153	100.0	100.0	

Obstetrician or GP

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	mentioned	8	5.2	5.2	5.2
	not mentioned	145	94.8	94.8	100.0
	Total	153	100.0	100.0	

Support groups

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	mentioned	5	3.3	3.3	3.3
	not mentioned	148	96.7	96.7	100.0
	Total	153	100.0	100.0	

Other support

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	mentioned	24	15.7	15.8	15.8
	not mentioned	128	83.7	84.2	100.0
	Total	152	99.3	100.0	
Missing	System	1	.7		
Total		153	100.0		

Breastfeeding satisfaction

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	130	85.0	85.5	85.5
	no	22	14.4	14.5	100.0
	Total	152	99.3	100.0	
Missing	System	1	.7		
Total		153	100.0		

Age of participant

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	20 - 24	12	7.8	7.8	7.8
	25 - 34	97	63.4	63.4	71.2
	35 - 49	44	28.8	28.8	100.0
	Total	153	100.0	100.0	

Highest qualification

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No formal education	60	39.2	39.2	39.2
	High school qualification	2	1.3	1.3	40.5
	Certificate or diploma	87	56.9	56.9	97.4
	University degree	2	1.3	1.3	98.7
	Missing	2	1.3	1.3	100.0
	Total	153	100.0	100.0	

Ethnicity

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	New Zealand Maori	20	13.1	13.1	13.1
	European	127	83.0	83.0	96.1
	Pacific Island Women	3	2.0	2.0	98.0
	Asian	1	.7	.7	98.7
	Other	2	1.3	1.3	100.0
	Total	153	100.0	100.0	

Occupation

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Leglislator/administrator	4	2.6	2.6	2.6
	Professional	27	17.6	17.6	20.3
	Technician/associate professors	13	8.5	8.5	28.8
	Clerks	7	4.6	4.6	33.3
	Service/sales workers	1	.7	.7	34.0
	Trades workers	2	1.3	1.3	35.3
	Elementary workers (Including residentials).	3	2.0	2.0	37.3
	Full time mother	94	61.4	61.4	98.7
	Student	2	1.3	1.3	100.0
	Total	153	100.0	100.0	

Type of LSCS

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Elective	21	13.7	13.7	13.7
	Emergency	63	41.2	41.2	54.9
	NB	68	44.4	44.4	99.3
	Not recorded	1	.7	.7	100.0
	Total	153	100.0	100.0	

Regional anaesthetic

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Epidural	39	25.5	25.5	25.5
	Spinal	40	26.1	26.1	51.6
	General	5	3.3	3.3	54.9
	None	68	44.4	44.4	99.3
	Missing data	1	.7	.7	100.0
	Total	153	100.0	100.0	

Labour

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	113	73.9	73.9	73.9
	no	39	25.5	25.5	99.3
	Missing data	1	.7	.7	100.0
	Total	153	100.0	100.0	

Length of labour

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	< 4 hours	36	23.5	24.3	24.3
	4.1 - 12 hours	61	39.9	41.2	65.5
	12.1 - 24 hours	14	9.2	9.5	75.0
	None	37	24.2	25.0	100.0
	Total	148	96.7	100.0	
Missing	System	5	3.3		
Total		153	100.0		

Oxytocin in labour

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	21	13.7	14.2	14.2
	no	127	83.0	85.8	100.0
	Total	148	96.7	100.0	
Missing	System	5	3.3		
Total		153	100.0		

Opiate following birth

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	78	51.0	52.7	52.7
	no	70	45.8	47.3	100.0
	Total	148	96.7	100.0	
Missing	System	5	3.3		
Total		153	100.0		

Weight of baby

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2500 - 2990	14	9.2	9.2	9.2
	3000 - 3499	52	34.0	34.0	43.1
	3500 - 3999	53	34.6	34.6	77.8
	4000 - 4499	31	20.3	20.3	98.0
	4500 - 5000	3	2.0	2.0	100.0
	Total	153	100.0	100.0	

Baby apgar at 1 minute

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	7	13	8.5	8.5	8.5
	8	25	16.3	16.3	24.8
	9	96	62.7	62.7	87.6
	10	19	12.4	12.4	100.0
	Total	153	100.0	100.0	

Highest qualification

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No formal education	15	9.8	9.9	9.9
	High school qualification	48	31.4	31.8	41.7
	Certificate or diploma	50	32.7	33.1	74.8
	University degree	33	21.6	21.9	96.7
	Other	5	3.3	3.3	100.0
	Total	151	98.7	100.0	
Missing	System	2	1.3		
Total		153	100.0		