

TITLE:

A Western Australian Survey of Breastfeeding Initiation, Prevalence and Early Cessation Patterns

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ABSTRACT

Objective: This paper reports on current initiation and prevalence rates, in Western Australia, differentiating ‘any’ breastfeeding with ‘exclusive’ breastfeeding whilst exploring patterns and reasons for stopping breastfeeding. The results presented are part of a larger study examining women’s perceptions of care and wellbeing in the early postnatal period.

Methods: A cross sectional survey was used to examine infant feeding practices during the hospital stay and at 9 weeks post birth from Western Australian women with a registered live birth between February and June 2006.

Results: Data obtained from 2669 women revealed a 93% (n=2472) initiation rate of any breastfeeding. More multiparous women (73.5%) were exclusively breastfeeding in hospital compared to primiparous women (65.2%), which decreased to 57.1% and 49.2% respectively at 9 weeks. Of those who had ceased by 9 weeks, more multiparous women (71.1%) ceased before 3 weeks. Reasons cited for ceasing in order of frequency were insufficient milk supply, infant related reasons, pain and discomfort and emotional reasons. Younger maternal age, primiparous women, lower maternal education levels, offering a combination of breast milk and formula in hospital and caesarean birth were significant independent predictors of early cessation.

Conclusions: Although initiation rates including “any” breast milk are meeting NHMRC dietary guidelines of 90%, the 60% target of exclusive breastfeeding is not being achieved for 3 months or in fact at 9 weeks. Targeted support for at risk groups such as younger, less well-educated, primiparous women must continue. Evidence based policies to protect breastfeeding must address the practice of offering formula to breastfed infants in hospital and the impact of increasing interventions such as caesarean births.

Key Words: breastfeeding, initiation, prevalence, cessation, Australia

Background

Breast milk is recognised for its ideal nutritional benefits. The return of breastfeeding as the cultural norm rather than the ‘best’ way to feed infants is being encouraged [1]. Infant benefits such as enhanced immunological and cognitive functioning should ideally be promoted as protection from infection, obesity, diabetes and asthma [2-4], with maternal benefits presented as risk reduction for breast cancer [5]. Consequently, international efforts to monitor breastfeeding initiation and prevalence rates are strongly advocated. However, international initiatives towards breastfeeding promotion vary and reflect diverse outcomes. To illustrate, initiation rates range considerably around the world from 74 to 99.5% in Europe; 91 to 97% in Australia; 69 to 83% in Canada and 27 to 69.5% in the United States [6]. Western Australian (WA) evidence revealed initiation rates as high as 83.8% in the mid 1990’s [7], with an increase to 88% by the late 1990’s [8]. More recently, the WA initiation rate has been reported as reaching 93.8% [9].

Although initiation rates are encouraging, breastfeeding prevalence rates at three months demonstrate similar declining trends ranging from 42 to 71% in Europe; 44 to 68% in Australia; 38 to 59% in Canada and 19 to 32.5% in the United States [6]. Promotion efforts are ongoing however, with recent Canadian findings revealing trends at 3 months increasing to 67% [10]. The Australian National Health and Medical Research Council (NHMRC) dietary guidelines [5] recommend initiation rates of 90%. Although the latest figures demonstrate that these rates have been achieved in Australia, the goal of 80% of women continuing to breastfeed at 6 months has not been realised. For example in 2001, only 48% of infants had received some breast milk (defined as ‘any’ breast milk) at 6 months [10]. Western Australian prevalence rates are comparable with national trends; 61.8% at 3 months and 49.9% at 6 months [8]. Despite this reduction, the Australian National Health Survey [11] published in 2003 revealed that 87% of infants aged 0 to 3 years received any breast milk; a similar result to 1995 (86%). This figure remains constant, with data from 2004-05, revealing that 88% of Australian children less than three years of age had received breast milk either exclusively or as part of their diet in combination with formula and/or solid food [12,13].

Evidence to date has focused upon ‘any’ breast milk being offered as opposed to ‘exclusive’ breastfeeding, which has been the recent focus due to recommendations by the World Health Organisation (WHO) [14]. The WHO recommends exclusive breastfeeding for 6 months,

whereby only breast milk and no supplemental fluids or solid foods other than medications or vitamins is offered [14]. In fact, the Australian National Health Surveys in 1995 and 2001 [13] revealed that only 54% of infants 3 months or less received any breast milk with evidence regarding exclusive breastfeeding as defined by WHO [15] not available for comparison.

Ongoing support of breastfeeding must be a priority if mothers and infants are to achieve the recognised health benefits. Over a period of 10 years, the number of Australian children who have received any breast milk has remained unchanged even though initiation rates have been improving suggesting investigation into patterns around early cessation is warranted. Therefore, this study aimed to increase knowledge into current Western Australian initiation and prevalence rates differentiating 'any' breastfeeding with 'exclusive' breastfeeding and exploring patterns and reasons for stopping breastfeeding during the early weeks post birth.

Method

A cross sectional survey was used to examine infant feeding practices during the early weeks post birth in a sample of Western Australian (WA) women. The survey was part of a larger study examining women's perceptions of care and wellbeing in the early postnatal period. A self report questionnaire, developed and tested in another Australian study [16], was posted to every WA woman with a registered live birth between February and June 2006.

Women were recruited via WA's Midwives Notification System (MNS). The MNS is a database of all births reported in the state of WA. Ethical approval was granted by the university and approval to access the database was obtained from the WA Department of Health.

Information packages, which included a letter of introduction, an information sheet, the questionnaire and self-addressed prepaid envelope, were delivered to the managers of the MNS. To capture early cessation patterns the packages were posted to women 8 weeks post birth. The researchers did not have access to women's personal details. The questionnaires were not coded or linked to names and addresses; therefore anonymity was assured. Data were stored in accordance with the National Health and Medical Research Council (NHMRC) recommendations [17].

Women were excluded if they experienced a perinatal death or their baby required an extended admission to the neonatal nursery (more than 7 days). Women under 16 years of age were also excluded. To determine the prevalence of breastfeeding with women returning the postal questionnaire within $\pm 2\%$ at the 95% confidence interval, a sample of 2449 subjects was

required [18]. Therefore, recruitment commenced in February and ceased in June 2006 when the sample size had been reached. A final sample size of 2669 women responded from 5538 mail outs during this five month period.

The questionnaire was specifically developed for postnatal women [16]. The reported Cronbach's alpha, a measurement of the instrument's internal consistency was 0.86, which exceeds minimum recommended scores of 0.70 when considering the reliability of an instrument [19]. It was modified slightly to identify women attending private versus public maternity hospitals in either metropolitan or rural settings. Questions on infant feeding included current feeding pattern, feeding pattern during the postnatal hospital stay, problems experienced since discharge and time and reason for breastfeeding cessation. The question regarding feeding patterns asked what statement best describes "how you fed your baby in hospital" and "how you are feeding your baby now". Selection of items differentiated only breast milk; mostly breast milk but an occasional bottle of formula; half breast milk and half formula; mostly formula and occasional breastfeeds; formula only and other. Demographic information such as age; education; income; parity; marital status; type of maternity hospital (public or private); residential location; and type of birth was collected.

Descriptive statistics and frequency distributions were used initially to summarise and describe the sample. Further analysis included chi-square test, independent samples t-test, univariate and multiple variable logistic regression analysis [20]. Logistic regression was used to determine the association between one or more variables with early breastfeeding cessation. The dependent variable is represented as cessation (1) and continuing (0). P-values less than 5% were considered as statistically significant. Data were analysed using SPSS Version 15.

Results

Demographic Profile

A total of 2669 women responded to the postal questionnaire, which represented 9.5% of the WA birthing population of 28,254 in 2006 [21]. A comparison of the study sample to the 2006 WA birthing population [21] for maternal age, marital status, parity, woman's country of birth and type of birth is provided in Table 1. Comparisons presented are for descriptive purposes only as categories for data collected on age and country of birth were not comparable. Our study sample was representative for parity, type of birth and maternal ages over 21 years, however, not for teenage or single mothers. Specific demographic data collected allowed subgroups to be

determined for data analysis under categories of type of maternity hospital (public or private), residential location (metropolitan or rural) and number of children (primiparous or multiparous). Each participant is therefore represented three times in these subgroups, as a primiparous or multiparous woman, a woman who attended a public or private hospital and a woman living in the Perth metropolitan area or a rural location. Questionnaires were posted 8 weeks post birth with the majority of women completing and returning the questionnaire within one week, and therefore the prevalence rate is reported at 9 weeks post birth.

Initiation Rates

The initiation rate for women offering any breast milk whilst still in hospital was 93% (n=2472). All subgroups had initiation rates over 92.5%. Please refer to Table 2 for a breakdown of the rates via subgroups. The rates of exclusive breastfeeding in hospital, however, were significantly lower. For example, for rural women, multiparous women and women giving birth in public maternity hospitals the rates varied from 78.6% to 73.3%. For metropolitan women, primiparous and private hospital subgroups, the rates were even lower at 67.9%, 65.2% and 65% respectively. The percentages of women offering formula only with no intention to breastfeed, ranged from 2.6% for primiparous women to 5.3% for multiparous women.

Further comparisons revealed a significant difference between how women fed whilst in hospital. More multiparous women, rural women and women in the public sector offered breast milk only when compared with their subgroup counterparts.

Prevalence Rates

The prevalence rate for any breast milk still being offered at 9 weeks post birth was 74.8% (n=1989). All subgroups had prevalence rates over 70.1% at 9 weeks (see Table 2). However, the rates of exclusive breastfeeding decreased significantly across all groups with less than 50% of primiparous women still breastfeeding exclusively at 9 weeks.

Once again, there was a significant difference in infant feeding patterns at 9 weeks between two of the three subgroups. More multiparous women (57.1%, n=843) gave their infant only breast milk compared to primiparous women (49.2%, n=582) ($\chi^2 = 24.023$, df=5, p=0.000). Although more women accessing public hospitals than private gave their infant only breast milk whilst in hospital, this trend reversed at 9 weeks; 57.4% of women who gave birth at a private hospital were exclusively breastfeeding at 9 weeks compared with 50.8% of women who

attended public hospitals ($\chi^2 = 25.394$, $df=5$, $p=0.000$). There were no differences between how metropolitan and rural women were feeding at 9 weeks.

Cessation of Breastfeeding

Of the women who had initiated breastfeeding ($n=2472$), 26.5% were offering formula only by 9 weeks post birth ($n=656$) (Table 2). The rates of women ceasing breastfeeding and offering formula only by 9 weeks in descending order of subgroup were: rural women (29.4%, $n=132$); women from public hospitals (28.1%, $n=424$); primiparous women (26.4%, $n=312$); metropolitan women (23.6%, $n=522$); multiparous women (23.3, $n=344$) and women accessing private hospitals (20.0%, $n=230$). There was a significant difference between parity with more primiparous than multiparous ceasing their breastfeeding by 9 weeks ($p = 0.000$). The mean infant age when breastfeeding was ceased by primiparous women was 4.57 weeks (SD 2.73) compared to 4.28 weeks (SD 2.77) for multiparous women ($p=0.288$).

More women accessing public than private maternity hospitals had ceased their breastfeeding at 9 weeks ($p = 0.000$). The mean infant age for ceasing breastfeeding for women giving birth in public hospitals was 4.472 weeks (SD 3.824) compared to 4.735 for women in the private sector (SD 2.999) ($p=0.889$). The comparison between rural and metropolitan women revealed no significant differences at 9 weeks post birth. The mean infant age of stopping for metropolitan women was 4.38 weeks (SD 2.66) compared to 4.62 weeks for rural women (SD 3.09) ($p=0.300$).

Although there were no significant differences between subgroups related to mean time of ceasing breastfeeding before 9 weeks post birth, when the time of cessation was divided into two periods (0 to 5 weeks and 6 onward) interesting trends were noted. The majority of women (64% to 65.9%) ceased breastfeeding before 5 completed weeks. The period between 1 and 2 weeks had the highest number of multiparous women, metropolitan women, and women from public and private hospitals ceasing their breastfeeding. Primiparous women and rural women continued to breastfeed longer with more of these women ceasing at 3 to 4 weeks. Table 3 represents the distribution of cessation by weeks for the subgroups. More multiparous women (71.1%, $n=106$) than any other group ceased before 3 weeks.

Reasons for Ceasing Breastfeeding

Women who indicated they had stopped breastfeeding were prompted to offer a reason for their decision. There were 487 responses provided by the 491 women who had ceased

breastfeeding by 9 weeks. Responses were collated into four categories: breast milk supply reasons, infant related reasons, pain and discomfort for the mother and emotional reasons. Women could cite more than one reason with 140 women citing reasons that covered two or more categories. Therefore, from the 487 responses there were 641 reasons categorised. The most frequently cited reason was insufficient breast milk supply, which accounted for 46.6% (n=227) of the responses. Infant related reasons ranked second (36.3%, n=177) and included an unsettled baby; inadequate weight gain; attachment problems; reflux, troublesome sleeping patterns and poor interest from the baby. Pain and discomfort associated with breastfeeding for the mother ranked third accounting for 30.2% (n=147) of responses. The final category was labeled emotional reasons (18.5%, n=90) and included concerns such as depressions due to the stress of breastfeeding; interfering with bonding; coping with other children; and the fact that breastfeeding was too time consuming.

Influencing Breastfeeding Cessation

Potential independent variables such as maternal age, parity, residential location, type of maternity hospital, maternal education, infant feeding pattern in hospital and type of birth were analysed for their association with breastfeeding cessation by 9 weeks. Variables with a significant association with breastfeeding cessation included: younger maternal age ($p<0.001$); primiparous women ($p<0.001$); rural women ($p<0.001$); women from a public maternity hospital ($p<0.05$); lower maternal education levels ($p<0.001$); offering a combination of breast milk and formula in hospital ($p<0.001$) and caesarean birth ($p<0.001$). In a multivariable logistic regression analysis, younger maternal age, primiparous women, lower maternal education levels, offering a combination of breast milk and formula in hospital and caesarean birth were significant independent predictors of breastfeeding cessation by 9 weeks. Residential location and giving birth in a public hospital were no longer significant in the multivariable model ($p>0.05$). The odds-ratio and associated 95% confidence intervals for each of these variables in the univariate and multivariable analyses are presented in Table 4.

Discussion

Although the required sample size numbers were obtained, it was essential to determine whether our sample was representative of the 2006 birthing population and therefore, demographic data were compared with 2006 statistics (Table 1). In summary, our study sample was representative for parity, type of birth and maternal ages over 21 years, however, not for

teenage or single mothers. Given that teenage mothers and unmarried mothers have been found to have lower initiation rates [22,23] and an increased risk for early breastfeeding cessation [24], our initiation and prevalence rates must be considered with these limitations that are not representative of these groups in the 2006 birthing population.

Although more multiparous than primiparous women were exclusively breastfeeding in hospital, multiparous women were more likely to cease earlier. Early cessation has been attributed to ineffective support from health care professionals and informal networks, unrealistic expectations, physical concerns and faltering commitment by mothers [25]. A “give it a go” breastfeeding culture has been recognised whereby women who intended to breastfeed also had an expectation of difficulties and failure with this underlying pessimism being confirmed if one aspect of breastfeeding ‘goes wrong’ [26]. Although Australian women have expressed being unprepared to experience difficulties, 83% experienced one or more breastfeeding problems before leaving hospital with 29% still experiencing problems after 2 weeks [27]. New Zealand women were also found to be less likely to be fully breastfeeding at 6 to 10 weeks postpartum if they experienced problems [28]. Professional and lay support is essential for all breastfeeding women especially if exclusive breastfeeding is the goal [29]. Support cannot be underestimated, particularly for multiparous women who may not actively seek assistance, as commitments are prioritised within the context of their family and other children.

Initiation rates that do not differentiate ‘any’ breastfeeding from exclusive breastfeeding do not highlight the frequency of potentially detrimental practices such as formula being offered to breastfed babies in hospital. Complacency regarding these hospital practices could result if the decline from ‘any’ breast milk to exclusively breastfeeding is not recognized as reported in our findings (ranging from 13.9% to 29.4% depending upon subgroup). Introducing formula during the postnatal hospital stay to a breastfeeding infant are known to compromise the success of breastfeeding and are negatively associated with any breast milk being offered by 6 months [30,31]. To illustrate this issue, of the 68% of American women still breastfeeding at 8 weeks, Lewallen et al. confirmed that 37% were also supplementing with formula [32].

The rates of exclusive breastfeeding at 9 weeks ranged from 49% to 57% in this study. The National Health Survey [9] revealed that only 54% of infants 3 months or less were being exclusively breastfed although the criteria allowed for other fluids or solids as well as breast milk. In our study, primiparous women, rural women and women attending public hospitals all

had exclusive breastfeeding rates below 54% at 9 weeks post birth which is a month short of the National Health Survey's timeframe. Given these trends it is likely that the rates could be even lower by 12 weeks.

Our findings suggest the greatest risk for early cessation of breastfeeding was before 6 weeks and in fact within the first 3 weeks. This is supported by a Danish study [33] where 98.7% initiated breastfeeding and after 4 months (59%) were still exclusive breastfeeding; however, 51% of those who stopped, had done so within the first 5 weeks. Another Australian study found that 85 to 100% of first time mothers indicated they required support at 2 weeks post birth with 57 to 72% of experienced mothers also confirming they wanted midwifery support around infant care [16].

Although rural women's initiation rates of 94.4% and exclusive breastfeeding rates in hospital of 78.6% were the highest of all subgroups, their prevalence rate of 70.1% at 9 weeks was the lowest and their cessation rate the highest at 24.2%. Support provided by health professionals does make a difference and is associated with longer prevalence and higher exclusive breastfeeding rates [29]. It could be surmised that women living in isolated rural settings are being disadvantaged in their breastfeeding efforts due to limited access to ongoing support once they have left hospital.

Factors associated with ceasing breastfeeding before 9 weeks were being young and a first time mother, being less well educated, experiencing a caesarean birth, attending a public maternity hospital and the baby receiving formula whilst in hospital. Although having the lowest exclusive breastfeeding rates in hospital (65%), the demographics of women from the private sector could explain their improved exclusive breastfeeding rates at 9 weeks. With higher education at an apprentice, diploma or degree level (72.6%) compared to 48.4% for women from a public hospital and more women over 30 years of age (69.1% versus 44.1%), women from the private sector represent those women known to persist with breastfeeding [12]. Associations between the mothers' educational level [33], type of birth [34-36], and offering formula to breastfeeding babies in hospital [31] and breastfeeding cessation have been recognized. In fact, the Baby Friendly Health Initiative (BFHI) which uses the ten steps to successful breastfeeding been strongly supported in Australia with 66 hospitals achieving Baby Friendly Accreditation to date [37]. However, given that Western Australia has only 3 (4.6%) accredited facilities in

Australia, further efforts to increase the number of BFHI facilities could reduce the practice of formula being offered to breastfeeding babies in hospital.

Reasons cited for ceasing breastfeeding in this study are supported by the literature. Perceptions of an inadequate milk supply and problems such as cracked nipples were noted in the Australian National Health Survey [11,12]. A further Australian study reported 66% of women experienced painful nipples and 14% reported an inadequate milk supply, whereas by 6 weeks 28% of women reported experiencing painful nipples and 17% an inadequate milk supply at 2 weeks [38]. At 1-month post birth American breastfeeding women who experienced pain and discomfort were surprised by the extent, intensity and duration of this discomfort and pain [39]. In relation to perceptions of milk supply, women appear to be making decisions about their supply before lactation is fully established. Breast engorgement, due to increasing blood and lymph levels plus increased milk volume, can take up to 3 weeks to resolve whereby breasts then soften even when milk supply is plentiful [40]. Although hormonal prolactin levels from 2 weeks to 3 months are 2 to 3 times higher than baseline levels [41] women may be misinterpreting the softening of their breasts as indicating a reduction in their supply.

Conclusion

The findings of this study offer greater insight into the breastfeeding initiation and prevalence rates plus early cessation patterns of Western Australian women. Although initiation rates of 'any' breastfeeding are meeting the NHMRC dietary guidelines of 90%, the 60% target of exclusive breastfeeding for 3 months is not being reached even at 9 weeks. This information reinforces the importance of targeting vulnerable mothers such as younger, less well educated, and first time mothers during the early postpartum period with appropriate hospital and community-based breastfeeding support as many women are ceasing breastfeeding within 3 weeks. In addition, multiparous women are at greater risk of ceasing breastfeeding earlier than primiparous women and their needs must not be overlooked. Finally, health professionals must remain vigilant against practices and policies that compromise breastfeeding outcomes such as separation of mother and baby after birth, which is exacerbated with increasing rates of intervention such as caesarean section. The practice of offering formula to breastfed babies without substantiated medical reasons must also be resisted. The provision of consistent evidence based information to breastfeeding mothers and their support people remains central to improving prevalence rates in the longer term.

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Table 1: Comparison of study sample to 2006 WA birthing population

	2006 Study Sample (N=2669)	2006 WA Perinatal Statistics²¹ (N=28,254)	
Mother's age			
16-20	82 (3.1%)	≤19	5.4%
21-25	325 (12.2%)	20-24	16.4%
26-30	796 (29.8%)	25-29	26.3%
31-35	991 (37.1%)	30-34	31.5%
36-40	417 (15.6%)	35-39	17.3%
41-45	13 (2.2%)	40-44	3.0%
		≥45	0.1%
Marital status			
Single	101 (3.8%)		7.2%
Defacto/Married	2544 (95.3%)		91.4%
Divorced/separated/widowed	24 (0.9%)		1.4%
Parity			
Primiparous women	1185 (44.4%)		41.8%
Multiparous women	1484 (55.6%)		58.2%
Woman's Country of Birth			
Australia/New Zealand	2103 (78.8%)	Australia	74.4%
Europe	244 (9.1%)	UK/Ireland	7.7%
Asia	110 (4.1%)	Asia	6.9%
USA	13 (0.5%)	Africa	3.8%
Middle East	8 (0.3%)	New Zealand	3.3%
Other	191 (7.2%)	Other Europe	2.4%
		Americas & Pacific Islands	1.5%
Type of Birth			
Normal vaginal birth	1368 (51.4%)		54.4%
Instrumental birth	377 (14.2%)		12.8%
Caesarean birth	919 (34.4%)		32.7%
Breech Manoeuvre	Missing		0.3%

Table 2: Infant feeding patterns (N=2669)

Time	Subgroup	Only breast milk	Mostly breast milk occasional formula	Half breast milk & formula	Mostly formula occasional breast milk	Only formula	Other	Sample size	Statistical comparison
In hospital post birth	Primiparous women	65.2% (n=769)	19.0% (n=224)	5.2% (n=61)	4.3% (n=51)	2.6% (n=31)	3.7% (n=44)	n=1180	$\chi^2 = 55.495$, df=5 p<0.0005 N=2657, missing 12
	Multiparous women	73.5% (n=1086)	13.9% (n=205)	3.5% (n=51)	1.7% (n=25)	5.3% (n=79)	2.1% (n=31)	n=1477	
9 weeks post birth	Primiparous women	49.2% (n=582)	16.1% (n=191)	5.2% (n=61)	3.0% (n=35)	26.4% (n=312)	0.3% (n=3)	n=1184	$\chi^2 = 24.023$, df=5 p<0.0005 N=2661, missing 8
	Multiparous women	57.1% (n=843)	13.3% (n=197)	3.4% (n=50)	2.1% (n=31)	23.3% (n=344)	0.8% (n=12)	n=1477	
In hospital post birth	Public hospital	73.3% (n=1106)	12.9% (n=195)	3.4% (n=52)	2.9% (n=44)	4.8% (n=72)	2.6% (n=39)	n=1508	$\chi^2 = 39.737$, df=5 p<0.0005 N=2657, missing 12
	Private hospital	65.0% (n=747)	20.7% (n=238)	5.1% (n=59)	2.8% (n=32)	3.2% (n=37)	3.1% (n=36)	n=1149	
9 weeks post birth	Public hospital	50.8% (n=768)	13.7% (n=207)	4.2% (n=64)	2.5% (n=38)	28.1% (n=424)	0.7% (n=10)	n=1511	$\chi^2 = 25.394$, df=5 p<0.0005 N=2661, missing 8
	Private hospital	57.4% (n=660)	15.8% (n=182)	3.8% (n=44)	2.5% (n=29)	20.0% (n=230)	0.4% (n=5)	n=1150	
In hospital post birth	Metropolitan women	67.9% (n=1500)	17.6% (n=389)	4.3% (n=94)	3.0% (n=66)	4.1% (n=91)	3.1% (n=68)	n=2208	$\chi^2 = 24.126$, df=5 p<0.0005 N=2657, missing 12
	Rural women	78.6% (n=353)	9.8% (n=44)	3.8% (n=17)	2.2% (n=10)	4.0% (n=18)	1.6% (n=7)	n=449	
9 weeks post birth	Metropolitan women	54.0% (n=1195)	15.1% (n=333)	4.2% (n=93)	2.5% (n=56)	23.6% (n=522)	0.6% (n=13)	n=2212	$\chi^2 = 7.957$, df=5 p=0.159 N=2661, missing 8
	Rural women	51.9% (n=233)	12.5% (n=56)	3.3% (n=15)	2.4% (n=11)	29.4% (n=132)	0.4% (n=2)	n=449	

Table 3: Early breastfeeding cessation pattern

	Up to 1 wk	1 to 2 wks	2 to 3 wks	3 to 4 wks	4 to 5 wks	N=320
Primiparous women	21 (12.3%)	41 (24.0%)	39 (22.8%)	47 (27.5%)	23 (13.5%)	171
Multiparous women	32 (21.5%)	45 (30.2%)	29 (19.5%)	27 (18.1%)	16 (10.7%)	149
Women (public hospital)	38 (19.3%)	50 (25.4%)	42 (21.3%)	42 (21.3%)	25 (12.7%)	197
Women (private hospital)	15 (12.2%)	36 (29.3%)	26 (21.1%)	32 (26.0%)	14 (11.4%)	123
Metropolitan women	39 (15.3%)	71 (27.8%)	57 (22.4%)	58 (22.7%)	30 (11.8%)	255
Rural women	14 (21.5%)	15 (23.1%)	11 (16.9%)	16 (24.6%)	9 (13.8%)	65

Table 4: Association between independent variables and breastfeeding cessation by 9 weeks post birth

Independent Variables	Univariate Logistic Regression		Multivariable Logistic Regression
	Odds Ratio	Confidence Intervals	
Maternal age			
16 – 20 years	3.79	(2.21 – 6.50)**	2.79 (1.52 – 5.11) *
21 – 25 years	1.93	(1.36 – 2.73)**	1.757 (1.19 – 2.63) *
26 – 30 years	1.06	(0.78 – 1.43) ns	1.08 (0.78 - 1.51) ns
31 – 35 years	0.99	(0.74 – 1.33) ns	0.98 (0.72 – 1.34) ns
> 36 years		1	1
Parity			
Primiparous	1.49	(1.23 – 1.83) **	1.27 (1.01 – 1.61) *
Multiparous		1	1
Location			
Rural	1.35	(1.05 – 1.73) **	ns
Metropolitan		1	
Type of maternity hospital			
Public	1.31	(1.07 – 1.60) *	ns
Private		1	
Maternal education level			
Less than year 12	2.78	(2.11 – 3.66) **	2.66 (1.95 – 3.62) **
Secondary school year 12 completion	2.50	(1.91 – 3.29) **	2.44 (1.82 – 3.28) **
Apprenticeship / diploma	1.70	(1.27 – 2.27) **	1.76 (1.30 – 2.40) **
Degree / postgraduate		1	1
Feeding pattern in hospital			
Combination breastmilk & formula	2.73	(2.20 – 3.38) **	2.75 (2.19) – 3.47) **
Only breastmilk		1	1
Type of birth			
Caesarean birth	1.50	(1.21 – 1.86) **	1.53 (1.20 – 1.95) *
Instrumental birth	1.17	(0.87 – 1.59) ns	0.95 (0.67 – 1.34) ns
Normal vaginal birth		1	1

Not statistically significant ns p < 0.05* p < 0.0005**