Reducing the Barriers to Breastfeeding: An Analysis of Health Services in Northern Ontario

Kristin E. Shields

Lakehead University

Thunder Bay, Ontario, Canada

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Abstract

Given that there is a societal expectation that mothers of newborns initiate and maintain breastfeeding for at least six months, there is a concomitant expectation that society provide the essential services, education, and support systems to ensure breastfeeding success. The purpose of this study was to:

1. Determine the barriers that affect a mother's decision to initiate breastfeeding and continue breastfeeding for the recommended six months (minimum).
2. Determine if current public health breastfeeding programs sufficient to overcome these barriers.
3. Determine what, if any, changes could be made to public health promotion or education programs to reduce the suggested barriers to breastfeeding.

The study used a secondary data analysis of raw data from the Northern Ontario Perinatal and Child Health Survey (NOPCHS) (2003) to resolve the specific questions related to barriers, programs, and recommended changes.

Regression analysis was used to first determine whether or not a mother chose to breastfeed, and second to determine how long a mother breastfed, exclusively. The results from the regression analysis suggested that a mother's choice to breastfeed was based on whether she wished to increase her bonding with her child; whether she was comfortable breastfeeding in public places; whether she was in good health; and the level of her partner's education.

Likewise, the regression output identified that the length of time a mother breastfed was determined by a mother reporting an inadequate supply of milk; the child weaning him/herself; whether a mother felt comfortable breastfeeding in the mall; the mother's confidence with breastfeeding at hospital discharge; whether the mother used of the Healthy Babies, Healthy

Children program; the number of cigarettes the mother smoked; reported fatigue or inconvenience of breastfeeding by the mother; a plan to stop at the time when child was weaned; whether the mother worried about insufficient milk supply; the mother's attendance at prenatal classes; the mother's comfort breastfeeding at the workplace; awareness of breastfeeding drop-ins; the choice to breastfeed for cost efficacy; and the mother having the support of a lactation consultant.

With respect to Research Question 2 (Determine if current public health breastfeeding programs sufficient to overcome these barriers), the results indicate that only 16% of the respondents continued to breastfeed at six months (the minimum duration recommended by the World Health Organization). This finding suggests that current public health breastfeeding programs are not sufficient to overcome the barriers to breastfeeding.

Finally, based on the specific responses to questions in the NOPCHS and from previous studies reported in the literature, it is suggested that breastfeeding programs must be relevant; available to assist and provide support to mothers; be explicit; widely advertised and easily accessible; and promote a culture that supports mothers in their decision to breastfeed, while providing information to the general public on the benefits of breastfeeding, promoting acceptance of this natural behaviour.

Table of Contents

List of Tables

List of Appendices

1.0. Introduction

1.1. Introduction

According to Labbok (2000), breastfeeding (through either direct feeding of breast milk or through feeding via expressed milk) is the optimum method by which to provide the necessary nutrients and antibodies to the child. The Breastfeeding Committee for Canada recognizes that exclusive breastfeeding is the only feeding method that can provide children with the full nutritional requirements needed to obtain the highest standards of health.

According to Statistics Canada, in 1996/1997, only 35.2% of infants were breastfed for at least three months (Statistics Canada, 2001). The Canadian Pediatric Society, Ontario Public Health Association, Dieticians of Canada, and Health Canada, in accordance with the World Health Organization (WHO) and the United Nations International Children's Emergency Fund (UNICEF), recommend exclusive breastfeeding for the first six months of life (Breastfeeding Committee for Canada, 2002). Further, it is recommended that breastfeeding be continued for at least two years. Dzakpasu and Trouton (1998) suggest that complementary foods be introduced while breastfeeding after the age of six months.

The benefits of breastfeeding to both mother and child are well documented (Lavin, 2001; Hanson, 1998; Health Canada, 1998). Most women who breastfeed consider 'the health of their child' the most important reason for their decision to breastfeed (Brownell, Hutton, Hartman, & Darbow2002; Brown, Poag, & Kasprzycki, 2001). However, other factors that may influence a mother's decision to breastfeed include eliminating the cost of formula, improved health of the mother, and the bond formed between mother and child. In Canada, breastfeeding

rates are highest among older, college-educated, white women of high socioeconomic status (Health Indicators, 2001; Williams, Innis, & Vogel, 1996; Dennis, 2002).

According to Hogan (2001), it is possible to increase the breastfeeding initiation and duration rates with proper support from family, friends, professionals, and community. This support can be achieved by a number of activities, such as ensuring that the mother is accompanied to prenatal classes, ensuring that the support person(s) are included in the breastfeeding meetings, and encouraging workplaces to support their employees who choose to breastfeed or express milk (Cohen, Lange, & Slusser, 2002; Stefuk, Green, Turnell, & Smith, 2002). In Northern Ontario, the support services which an expectant mother can access include the Healthy Babies, Healthy Children program, peer support groups (including chapters of La Leche League), access to lactation consultants, and educational materials provided by the Public Health Department.

There are several noted benefits to mother and child as a result of breastfeeding. The reasons a mother states for not breastfeeding are the barriers to breastfeeding. From a public health perspective it is important to determine the barriers to breastfeeding. Therefore, the questions to be investigated are:

1.2. Problem Statements

1. Determine the barriers that affect a mother's decision to initiate breastfeeding and continue breastfeeding for the recommended six months (minimum)?
2. Determine if current public health breastfeeding programs sufficient to overcome these barriers?
3. Determine what, if any, changes could be made to public health promotion or education programs to reduce the suggested barriers to breastfeeding?

1.3. Rationale

It is evident from the literature available on breastfeeding that there are barriers that affect a woman's decision to breastfeed. Breastfeeding practices in Canada, especially with respect to noted barriers to breastfeeding, are similar to those in other countries. In order to best understand the barriers that a new mother must overcome in order to breastfeed successfully, it is imperative to ask the women themselves what allows them/prevents them from breastfeeding.

There have been many studies completed on the trends of breastfeeding practices in Canada, but relatively few large-scale studies in which women were asked to identify the key factors that affected their decisions to breastfeed. Further, population distribution and relative sampling by surveyors has not been generally representative of individuals from Northern Ontario. Northern Ontario is unique in several regards. For example, there are geographic limitations that negatively influence the communication of health information. As well, there are several cultural differences that inhibit the dissemination of positive health practices. When combined, vastness and cultural differences influence the ability of public health practitioners to create and implement health services programs that may benefit mothers and children directly.

The present study will use a secondary data analysis methodology to evaluate the problem statements previously stated.

1.4. Limitations and Delimitations

1.4.1. Limitations

There were a number of limitations to the Northern Ontario Perinatal and Child Health Survey (NOPCHS) that may impact the present study. The survey used an ordinal-based score

consisting of a Likert scale, and some open-ended questions. The sample, although based on a probabilistic model may have had some limitations in its representation. The original study was restricted to mothers; fathers, family members, employers and elders were not included in the original collection but may have a large impact on the decision to breastfeed and these perspectives may differ from mothers'. Further, some groups of mothers may have been under-represented in this sample, since individuals without telephones were not included (leading to under-representation of lower socioeconomic status families) and mothers whose children lived in institutions were exempt from this survey (leading to under-representation of those families with children who are ill or requiring inpatient treatment). The mothers who volunteered for the NOPCHS via the Healthy Babies, Healthy Children program may not represent those not willing to be interviewed or the average new mother.

Some issues related to internal validity may have affected the data since the social desirability of questions may influence a respondents' willingness to answer a question completely. Respondent fatigue may have occurred because the questionnaire was quite lengthy. Since results include experiences of mothers from six years ago, respondents may have displayed recall bias if they haven't breastfed in 6 years, and they may have been biased by age and cultural trends that have occurred over the past 6 years.

1.4.2. Delimitations

In an attempt to collect data from a sample of mothers representative of those in Northern Ontario, respondents were selected through random digit dialing as well as through the list of volunteers from the Healthy Babies, Healthy Children program. The sample used in the NOPCHS included a large number of respondents from each Northern Ontario Health Unit

District to ensure that each District was represented in the Survey. The sampling frame is described in Chapter 4.

1.5. Glossary of Important Terminology:

Acculturation

Both a group and individual phenomenon; a process by which members of one group adopt the cultural traits of another group with whom they are in contact (Health Canada, 1997).

Baby-Friendly Hospital Initiative (BFHI)

Conceived in 1991 jointly by the World Health Organization and the United Nations Children's Emergency Fund as a strategy to improve breastfeeding rates worldwide. A hospital or birth-center can receive Baby-Friendly designation if they show compliance with the Ten Steps to Successful Breastfeeding (Phillip, Merewood, Miller, & Chawla, 2001).

Barrier

A factor, belief, or circumstance that makes it difficult to reach the desired goal (i.e. exclusive breastfeeding for first six months of newborn's life) (Head, Brownell, Hutton, Hartman, & Dabrow, 2002).

Breastfeeding

The child has received breast milk direct from the breast, or expressed (Labbok, 2000).

Breastfeeding Duration Rate

Breastfeeding duration rates refer to the proportion of women who chose to breastfeed their child, for a given duration and may be in combination with formula feeding (Dennis, 2002). Note: In this study, the duration rates given will be for exclusive breastfeeding (breastfeeding only—no use of formula).

Breastfeeding Initiation Rate

Breastfeeding initiation rates refer to the proportion of women who chose to breastfeed their child, regardless of duration, and may be in combination with formula feeding (Dennis, 2002).

Colostrum

First milk produced by the breast. It is a rich yellowish fluid, containing water, sugar, protein, and vitamins that a baby needs. It also provides the child with some protection against infection and allergies (Health Canada, 1990).

Expressed Milk

Breast milk is emptied from the breast by hand or pump and then fed to the infant by bottle (Brown *et al.*, 2001).

Formula Feeding

The child receives some liquid or semi-solid food that is not breast milk (Labbok, 2000).

Healthy Babies, Healthy Children (HBHC)

The Healthy Babies, Healthy Children Program is designed by the Ontario Ministry of Health and Long Term Care to ensure that all Ontario families with children (prenatal to age six) who are at risk of physical, cognitive, communicative and/or psychosocial problems have access to effective, consistent early intervention services (Ontario Ministry of Health and Long Term Care, 2002).

Lactation

The secretion and ejection of milk by the mammary glands (Tortora & Grabowski, 2000).

La Leche League

Founded in 1956 by seven women who learned about successful breastfeeding while nursing their own babies, La Leche League's sole purpose is helping mothers to breastfeed. When a woman joins La Leche League, she participates in a mother-to-mother helping network, a priceless resource for breastfeeding and parenting help, support, knowledge, and inspiration (La Leche League, 2003).

Multiparous

Having more than one birth (Sheeshka, Potter, Norrie, Valaitis, Adams, & Kuczynski, 2001).

Northern Ontario Perinatal Child Health Survey (NOPCHS)

An extensive project to gather new data on perinatal and child health across Northern Ontario and at the individual health unit level by means of a telephone survey. The main topics

of interest were: parenting, breastfeeding, unintentional injuries and safety, asthma, food safety, and prenatal and child nutrition (NOPCHS Consortium, 2002).

Perinatal

The period in the human life cycle between 0 and 6 years (NOPCHS Consortium, 2002).

United Nations Children's Emergency Fund (UNICEF)

Along with the World Health Organization, UNICEF believes that breastfeeding is the most cost-effective, health-promoting, and disease-preventing activity new mothers can perform. UNICEF developed the Innocenti Declaration (1990), co-launched the worldwide Ten Step Baby-Friendly Hospital Initiative (1991), and led Beijing Declaration and Platform for Action (1995) (Dennis, 2002; Humenick & Gwayi-Chore, 2001).

Wet Nurse

A woman who breastfeeds infants other than her own (Pilkenton, 2002).

Women, Infants, and Children (WIC)

A division of the Food and Nutrition Service, U.S. Department of Agriculture. This program serves to safeguard the health of low-income women, infants, & children up to age 5 who are at nutritional risk, by providing nutritious foods to supplement diets, information on healthy eating, and referrals to health care (Food and Nutrition Service, United States Department of Agriculture, 2003).

World Health Organization (WHO)

Along with the United Nations Children's Emergency Fund, WHO believes that breastfeeding is the most cost-effective, health-promoting, and disease-preventing activity new

mothers can perform. It organized the International Conference on Primary Health Care (1978), developed the International Code of Marketing Breast-Milk Substitutes, co-initiated the Breast-Friendly Hospital Initiative, and launched worldwide the Ten Step Baby-Friendly Hospital Initiative (Dennis, 2002; Humenick and Gwayi-Chore, 2001).

1.6. List of Acronyms

WIC–Women, Infants, and Children program

UNICEF–United Nations Children's Emergency Fund

WHO–World Health Organization

BFHI–Baby-Friendly Hospital Initiative

NOPCHS–Northern Ontario Perinatal Child Health Survey

HBHC–Healthy Babies, Healthy Children

2.0. Review of Literature

The following review of literature was developed for this project. However, it should be noted that the author selected several excerpts from this review as contributions to the "Breastfeeding Practices in Northern Ontario" publication by the Northern Ontario Perinatal and Child Health Survey Consortium. The areas of overlap between this thesis and the subsequently written NOPCHS report are: Reasons Women Stop Breastfeeding at Various Time Intervals (beginning on page 36) and the section entitled Source of Breastfeeding Support for Pregnant and New Mothers (beginning on page 49).

2.1. Introduction

2.1.1. History

According to Pilkenton (2002), breastfeeding has been used as a means to provide nourishment to the child since early in the human evolutionary cycle. Egyptian historical records indicate that breastfeeding was a common practice recorded as early as 1700 B.C. Later writings, circa 500-600 B.C., reported that the use of wet nurses was common practice among royalty in Egyptian, Roman, and Greek societies (Pilkenton, 2002). Wainwright (2003) reported that wet nurses were employed by the wealthy until medieval times, by which time use of wet nurses was considered to be the normal practice among all levels of society.

Pilkenton (2002) indicated that as early as 1400 A.D., breast milk substitutes (for example cows' milk and goats' milk) were gaining popularity. The breast milk substitute was delivered by enabling the child to suck from hollow horns or to drink from cans, or pots

(Pilkenton, 2002). The resurgence of mothers' breastfeeding their own children began as early as 1600 (Pilkenton, 2002). One alternative to breastfeeding and wet nursing was "dry nursing". Dry nursing may be considered an early precursor to the current practice of using synthetic baby formula. Early dry nursing consisted of feeding the child a mixture of flour (bread or cereals) with broth or water.

2.1.2. Noted Benefits of Breastfeeding Practices

Several authors have reported the benefits of breastfeeding to both mother and child. (Dennis, 2002) The benefits of breastfeeding for an infant are well documented and can be either short or long term (Zeretzke, 1997). Breast milk supplies the necessary nutrients for the new baby and breast milk composition changes as the needs of the infant change (Health Canada, 1990). The composition of breast milk has not been duplicated in any formula (Health Canada, 1998; NRDC, 2001).

Direct breast milk is always safe, fresh, and exactly the right temperature (Health Canada, 1998). Breast milk contains properties that protect it from bacterial contamination, and thus expressed milk can be used safely if expressed, stored, and heated according to recommendations (Thunder Bay Health Unit, 2003). Breastfeeding reduces the chance of a child being exposed to pesticides or microorganisms (NRDC, 2001). It is possible for a baby to be exposed to bacteria or toxins from the water added to formula, or used during the cleaning of the nipples and bottles, or pesticides or other toxins in the formula itself (NRDC, 2001). Since infants are especially susceptible to illness, due to undeveloped immune systems, exposure to bacteria, toxins, and pesticides should be a consideration for mothers deciding whether to breastfeed (Dennis, 2002).

It has been suggested that many diseases or disorders are more prevalent in children who are not breastfed. The short and long term benefits of breastfeeding are identified in Table 2.1.

Table 2.1. Short Term Health Benefits to Children Who Are Breastfed

Short Term Benefits to Child	**Reference**
Reduced risk of anemia	Kazal, 2002; Sherry & Mei, 2001
Reduced risk of childhood communicable diseases	Thompson, 2002b
Reduced risk of botulism	Thompson, 2002c; Hanson, 1998
Reduced risk of Sudden Infant Death Syndrome (SIDS)	Health Canada, 1998
Reduced risk and lessened severity of diarrhea	Thompson, 2003; Thompson, 2002a
Reduced risk of gastrointestinal disease	Health Canada, 1998
Reduced risk of and lessened severity of infections	Health Canada, 1998; Thompson, 2002a
Reduced risk of necrotizing enterocolitis	Thompson, 2002c; Hanson, 1998; Gartner, Black, Eaton, Lawrence, 1997
Reduced risk of diabetes	Essig, 2000; Lavin, 2001; Thompson, 2002c
Reduced risk of otitis media	Health Canada, 1998; Thompson, 2002c
Reduced risk of respiratory infections	Health Canada, 1998; Oddy, 2002
Reduced risk of sepsis	Furman, Taylor, Minich, N. & Hack, M., 2003
Reduced risk of urinary tract infections	Hanson, 1998

Table 2.2. Longer Term Health Benefits to Children Who Are Breastfed

Longer Term Benefits to Child	Reference
Reduced risk of childhood cancer	Shu, Linet, Steinbuch, & Wen, 1999; Lavin, 2001, Thompson, 2002c; Linet, Wacholder, & Zahm, 2003
Reduced risk of gastrointestinal disease	Health Canada, 1998; Aikin, 1999; von Mutius, 1997
Reduced risk of heart disease	Singhal, Cole, & Lucas, 2001; Moxley, & Haddon, 1999
Reduced risk of inguinal hernia	Wyatt, 2002
Reduced risk of multiple sclerosis	Pisacane, Russo, Valiani, & Florio, 1994; Hanson, 1998
Reduced risk of juvenile rheumatoid arthritis	Hanson, 1998

While there continues to be debate on whether breastfeeding prevents or reduces the severity of allergies and asthma, there is a general belief that the breastfeeding effect occurs in the short term (Health Canada, 1998; Sears, Greene, Willan, Taylor, Flannery, Cowan, Herbison, & Poulton, 2002; Lavin, 2001). While measures of intelligence are considered to be nebulous at best by most researchers, there are published studies, as recent as 2001, which purport that breastfed children demonstrate higher scores on I.Q. tests (Mortensen, Fleischer & Michaelsen, 2002; Kerr, 2001).

In addition to the benefits gained by a breastfed infant, there are also numerous benefits to the mother who breastfeeds (Dennis, 2002). Postpartum bleeding is decreased by breastfeeding (Wong, 2002). Breastfeeding causes amenorrhea (temporary cessation of the menses), increasing the time between pregnancies by providing 98% to 99% effective protection against conception within the first six months postpartum (Labbok, 2001; Dermer, 2001).

Breastfeeding decreases the risk of certain forms of cancer, including ovarian cancer (Lewis, 2003; Dobson & Murtaugh, 2001; Lavin, 2001; Zeretzke, 1997), endometrial cancer

(Zeretzke, 1997), and breast cancer (Christensen, 2002). Breastfeeding reduces a diabetic mother's need for insulin and there have been reports of at least a two-fold reduction or delay in the onset of subsequent diabetes for a gestational diabetic (Zeretzke, 1997). Breastfeeding protects women against osteoporosis; a mother's bone mineral density increases with each child breastfed

(Kalwart & Specker, 1995). According to Kalwart and Specker (1995), mothers choosing to breastfeed are therefore less likely to fracture a hip, vertebrae, humerus or pelvis.

Mothers who breastfeed are more likely to return to their pre-pregnancy weight than mothers who formula feed (Labbok, 2001). Breastfeeding mothers burn an average of 500 calories more than formula feeding mothers per day (Dermer, 2001). During the first year postpartum, breastfeeding women lose an average of 2 kg more than non-breastfeeding women with no return of weight once weaning occurs (Zeretzke, 1997).

2.1.3. Comparative Financial Benefits of Breastfeeding

In a 2001 review and analysis of the economic benefits of breastfeeding, a division of the United States Department of Agriculture determined that a minimum of $3.6 billion would be saved if breastfeeding were increased from current levels (64 percent in-hospital and 29 percent at 6 months) to those recommended by the U.S. Surgeon General (75 percent in-hospital and 50 percent at 6 months) (Weimer, 2001). However, the estimate of a $3.6 billion savings is likely an underestimation of the total savings across the health and employment/workplace settings because the estimate represents cost savings from the treatment of only three childhood illnesses: otitis media, gastroenteritis, and necrotizing enterocolitis (Weimer, 2001).

Ball and Wright (1999) reported a similar proportional savings to Weimer (2001) in their comparison of exclusively breastfed and never-breastfed infants at three months. Frequency of health service utilization for three illnesses (lower respiratory tract illnesses, otitis media, and gastrointestinal illness) was reported for breastfed only and never-breastfed infants during the first year of life. Cost estimates were based on the direct medical costs within a large managed care health care system in 1995. Comparing never-breastfed infants to infants breastfed exclusively during the first year of life, Ball and Wright found that the never-breastfed infants cohort relied on the health care system for an extra 2033 office visits, 212 days of hospitalization, and 609 prescriptions during the three months following birth. The increase in health care service utilization translates to an additional cost of between $331 and $475 per never-breastfed infant when compared to an infant who is exclusively breastfed during the first year (Ball & Wright, 1999).

Labbok (1995), as cited by Zeretzke (1997), stated that providing lactational support to new mothers has definite economic benefits. According to Labbok (1995) increasing breastfeeding support to include one lactation consultant for every 1000 people, as well as providing additional training to lactation consultants, and increasing direct support to the mother by a lactation consultant would demonstrate a cost of $360 million per year (in U.S. dollars). However, the use of a lactation consultant would lead to a savings of over $1 billion (U.S.) in health care costs per year (Zeretzke, 1997).

Not only are the health care service costs higher for an infant who is not breastfed, but the cost of infant formula must also be considered. The following chart, reproduced from INFACT

Canada (1997), outlines the cost of formula for six months and how a single parent relying on welfare is affected financially by the cost of infant formula.

Table 2.3. The cost of formula for six months and the effect on a single parent relying on Welfare

Location	Cost of Formula for 6 months (Cdn)	Maximum Welfare income for single	Percent of Income for Formula
Vancouver, BC	$381-1247	$7050	5-18%
St. John's, NF	$401-1301	$5664	7-23%
Fredericton, NB	$401-1422	$4650	9-31%
Edmonton, AB	$375-1301	$6102	6-21%
Saskatoon, SK	$375-1301	$5760	7-23%
Yellowknife, NWT	$453-1476	$4500	10-33%
Toronto, ON	$420-1422	$6516	6-22%
Halifax, NS	$437-1985	$5898	7-34%

2.1.4. Recommendations for Breastfeeding Initiation and Duration

The Canadian Pediatric Society, Dietitians of Canada, and Health Canada issued a joint policy statement in 1998, recommending exclusive breastfeeding of infants for at least the first four months of life (Sheehan, Bridle, Hillier, Feightner, Hayward, Lee, 1999). These guidelines are similar to the World Health Organization, which recommend exclusive breastfeeding for the first six months of life (McLeod, Pullon, & Cookson, 2002). It should also be noted that the public health organizations listed above suggest breastfeeding occur for up to two years of age or longer (Health Canada, 1998).

2.2. Background to Breastfeeding Practices

2.2.1. Breastfeeding Initiation Rates

2.2.1.1. Global Rates

Initiation rates in the US fell to 52% in 1989 (Ryan *et al.,* 1991, as cited in Nolan, 1995) and were at 65% in 2001 (Ruowei, Grummer-Strawn, Zhao, Barker, & Mokdad, 2003). In Australia, breastfeeding initiation rates declined from the 1950s to the 1970s, and then increased steadily into the 1990s with relatively high initiation rates of 84% in Perth, 87% in Newcastle, and 88% in Toowoomba (Scott & Binns, 1998). Breastfeeding initiation rates in Canada were also relatively high in comparison to Britain and Hong Kong, where between 1995 and 1997, initiation rates were 66% and 34%, respectively (Bailey & Pain, 2001; Leung, Ho, & Lam, 2002).

2.2.1.2. Rates in Canada

Initiation rates in Canada have increased steadily over the past few decades (Dennis, 2002). During the 1960s and 1970s, breastfeeding initiation rates were approximately 25% (Myres, 1979, as cited in Dennis, 2002, Health and Welfare Canada, 1993, as cited in Williams, 1996). Between 1980 and 1982, the national average rate of breastfeeding initiation increased to 69% (McNally *et al.*, 1985, as cited in Nolan & Goel, 1995). Both the National Population Health Survey and the National Longitudinal Survey of Children and Youth established the national average breastfeeding initiation rate was 73% in 1994/1995 (Dzakpasu & Trouton, 1998). More recent national surveys have found that breastfeeding initiation rates in Canada are closer to 80% (Health Canada, 1999 as cited in Dennis, 2002; Nolan & Goel, 1995).

Breastfeeding initiation rates vary widely within Canada, exhibiting a distinct east-west gradient. Western provinces such as British Columbia, Alberta, and Saskatchewan display high breastfeeding initiation rates of 89%, 90%, and 88%, respectively (Statistics Canada, 2001). In Ontario, breastfeeding initiation is between 80% and 84% (McKilligan, 1991, as cited in Bourgoin, Lahaie, Rheaume, Berger, Dovigi, Picard & Sahai, 1997; Sheehan, 2001). Moving east, rates plunge considerably with Quebec having an initiation rate of 54% and the Atlantic provinces having an average of 53% (NPHS, 1994/1995 as cited in Prince Edward Island Breastfeeding Coalition, 2002). Matthews and colleagues (1998) reveal that breastfeeding initiation rates in Newfoundland are 41.7%, while Barber, Abernathy, Steinmetz, & Charlebois (1997) estimate initiation rates in eastern Newfoundland to be approximately 31%.

2.2.2. Breastfeeding Duration Rates

2.2.2.1. Global Breastfeeding Rates

Breastfeeding rates of four months postpartum in Britain are approximately 27% (Bailey & Pain, 2001); and in The Netherlands, 21% (Bulk-Bunschoten, 2001). In the United States, breastfeeding rates are approximately 27% and 12% at six and twelve months, respectively (Ruowei *et al.*, 2003). In Hong Kong, breastfeeding rates at six months were found to be approximately 10% in 1997 (Leung, 2002).

2.2.2.2. Rates of breastfeeding in Canada

Canadian women appear to breastfeed longer than women in many other parts of the world. However, there are differences in breastfeeding rates between Canadian provinces as well as within provinces. Although the most dramatic decline in breastfeeding rates is observed

within the first month postpartum, breastfeeding rates continually decline through the first year (Dennis, 2002). Results of a study completed by Williams *et al.* (1996) in British Columbia support previous findings: breastfeeding rates fell from 89% at initiation, to 71% at one month postpartum. Similarly, in Quebec, reported breastfeeding rates of 72%, at initiation, fell to 60% at one month postpartum (ELDEQ, 1998-2000). Breastfeeding rates at four months postpartum are approximately 53% in Vancouver (Williams *et al.*, 1996) and 59% in Quebec (Dubois, 2003). Studies completed in the Middlesex-London region of Ontario found breastfeeding rates are between 51% and 62% at four months postpartum (McHale, 1999). At six months, only 30% to 40% of Canadian mothers breastfeed (Bourgoin *et al.*, 1997, as cited in Dennis, 2002). Tables 2.4., 2.5., and 2.7. outline breastfeeding duration rates at one month, four months, six months, and twelve months, respectively.

2.2.2.3. Canadian Breastfeeding Duration Rates at Various Time Intervals

Table 2.4. Breastfeeding rates at one month

Location	Year	Percentage of Women Who Reported to Breastfeed at 1 month	Reference
Vancouver, BC [1,2]	[1]1986 [2]1996	[1]65% [2]71%	[1]Ellis & Hewat, 1986 [2]Williams *et al.*, 1996
Quebec, PQ	1998-2000	60%	ELDEQ, 2001
Newfoundland	1998	65%	Matthews, Webber, McKim, Banoub-Baddour, & Laryea, 1998
Ontario	1999	87%	Bowden, Resendes, I., & Coleman, 1999

Table 2.5. Breastfeeding rates at four months

Location	Year	Percentage of Women Who Reported Breastfeeding at 4 months	Reference
Canada [1,2,3]	[1]1982 [2]1990 [3]1997	[1]44% [2]30% [3]35%	[1]Williams *et al.*, 1996 [2]Williams *et al.*, 1996 [3]Barber *et al.*, 1997, as cited by Dennis, 2002.
Newfoundland	1998	41%	Matthews *et al.*, 1998
Quebec	2003	59%	Dubois, 2003
Middlesex-London, Ontario	1999	62%	INFACT, 1999

Table 2.6. Breastfeeding rates at six months

Location	Year	Percentage of Women Who Reported to Breastfeed at 6 months	Reference
Canada	[1]1995 [2]1994 [3]1991	[1]22% [2]33% [3]30-40%	[1]Bowden *et al.*, 1999 [2]Bowden *et al.*, 1999 [3]Lawrence, 2001
Newfoundland	1998	33%	Matthews *et al.*, 1998
Quebec	2003	41%	Dubois and Girard, 2003
Vancouver, British Columbia	1996	30%	Williams *et al.*, 1996
Toronto, Ontario/Montreal, Quebec	1986	31%	Ellis & Hewat, 1986
Ontario	1991	<50%	McKilligan, 1991
London-Middlesex, Ontario	1999	54%	INFACT, 1999
Sudbury, Ontario	1999	40%	Bowden, 1999

Table 2.7. Breastfeeding Rates at twelve months

Location	Year	Percentage of Women Who Reported to Breastfeed at 12 months	Reference
Elgin-St. Thomas, Ontario	1999	13%	Bowden, 1999

2.3. Why do Mothers Choose To Breastfeed?

Although the choice to breastfeed is a personal decision and involves a combination of many factors that are unique to a woman's situation, the literature reveals common reasons why women choose to breastfeed. According to Brownell, Hutton, Hartman & Darbow (2002), the most reported reasons for breastfeeding in their study were related to benefits for the baby's health, benefits for the mother, and convenience. The most commonly reported reasons for not breastfeeding were related to embarrassment, perceived pain, and lack of interest.

Participants in a study by Brown *et al.* (2001) knew that there were physical and psychological benefits of breastfeeding for mothers and children. Participants stated optimal infant nutrition, the bond breastfeeding creates between mothers and children, and mothers' peace of mind that they provide the best food for their children as the main reasons for their preference to breastfeed. In a later study by Pollock, Bustamante-Forest, & Giarrantano (2002) of male perceptions about a mother's choice to breastfeed, the authors found that almost all of the men wanted their baby to be breastfed, stating mother/infant attachment and enhanced nutrition as the main reasons for breastfeeding. Achieving positive states of health, gaining nutritional benefits, and 'bonding' were also reported to matter most to the breastfeeding mothers in a study by Guttman & Zimmerman (2000).

In a cohort of women studied by Williams, Innis, Vocel, & Stephen (1999), "personal choice" was the reason most often stated by a mother choosing to breastfeed. Among Caucasian women, the cost of formula, books about breastfeeding, and being available to breastfeed (not being at work or school) were stated more frequently as influencing the choice to breastfeed. This compared to non-Caucasian mothers for whom, after personal choice, physician's advice was the factor most frequently stated to influence the choice to breastfeed (Williams *et al.*, 1999).

The decision to breastfeed versus use of alternative methods seems to be more than merely a personal preference among mothers. According to Kannan, Carruth, and Skinner (1999) the decision to breastfeed is strongly influenced by ethnic trends and beliefs. In a study of 530 women comprising three ethnic groups, namely Anglo Americans, Asian-Indian Americans, and Asian-Indians, Kannan and coworkers found that ethnic groups hold strong cultural beliefs about child feeding practices. The authors showed that Asian-Indian mothers were more likely than mothers from the comparative cohorts to add cereal to a baby's bottle to ensure "sleeping through the night".

In a similar investigation of culturally based practices for breastfeeding, Gracey (2000) described the effects of urbanization and rapidly changing lifestyle on Australian Aborigines. In his study of this hunter-gatherer population, Gracey noted some changes in the attitudes and behaviours related to breastfeeding. Breastfeeding was the norm, and often prolonged in this traditional society, with infants being breastfed for at least two years. In the remote areas of Australia, the author reported that breastfeeding continues to be universally practiced. However, among those Aborigines that have moved to towns and cities, breastfeeding practices have

declined sharply. Gracey speculated that these feeding patterns are likely to have very significant impacts on the nutrition and health of young Aborigines and, perhaps, on their long-term health, morbidity, and mortality during adult life.

Dodgson, Duckett, Garwick, and Graham (2002) studied breastfeeding in an Ojibwe population. Three groups of participants were interviewed: health care and social service providers (n=13), postpartum women who had chosen to breastfeed (n=19), and community resource people (n=13). Participants noted that they received mixed messages (conflicting verbal or nonverbal communication that caused discomfort or confusion) about breastfeeding from health care providers, health education materials, the public media, family, and friends. Historically, the Ojibwe had many traditions that supported breastfeeding mothers and children. Breast milk was valued as the healthiest food for babies and the medicinal properties were well understood. Elders reported that the breast was not considered an object of sexual desire in traditional indigenous communities. Several middle-aged participants reported that when they moved to the city from the reservation they stopped breasfeeding because they associated it with "being poor." Dodgson and colleagues noted the importance of using teaching and promotion activities (about breastfeeding) that incorporate cultural values by seeking the assistance of elders and other interested parties within the community.

2.4. Why Do Women Choose Not to Breastfeed/Discontinue Breastfeeding?

2.4.1. Reasons Women Formula Feed

Upon examination of the reasons for formula feeding, it should be noted that most of the reasons women give for formula feeding are "mother-centered" while reasons to breastfeed are

often more "infant-centered" (Matthews *et al.*, 1998). Lack of time to breastfeed was a common concern expressed by formula feeding mothers. Many women also reported choosing to formula feed because they felt that their spouse could actively participate in the feeding process (ELDEQ, 1998-2002). Other reasons for formula feeding included health or fatigue problems, and a mother's smoking habit (ELDEQ, 1998-2002). Many formula-feeding mothers chose this method because they considered it to be more convenient than breastfeeding, contradicting one of the major perceived advantages of breastfeeding, convenience. A number of psychosocial factors also make formula feeding more attractive to some mothers, who report feeling awkward or embarrassed when they breastfeed in public.

2.4.2. Reasons Women Stop Breastfeeding at Various Time Intervals

Women often stop breastfeeding within the first month after childbirth due to physiological problems (ELDEQ, 1998-2002; Bulk-Bunschoten, Bodegom, Reerink, Pasker de Jong, & Groot, 2001). Breastfeeding cessation between seven and twenty-nine days occurred 92% of the time due to problems such as "insufficient milk", "breast pain", or "the child does not want to take to the breast" (ELDEQ, 1998-2002). Similarly, Bulk-Bunschoten *et al.* (2001) and Bourgoin *et al.* (1997) discovered that cessation before one month postpartum is largely due to physical problems such as nipple soreness. Matthews and colleagues (1998) identified other infant-related troubles causing mothers to discontinue breastfeeding after one month including "baby not being satisfied" (24%), "breastfeeding too difficult" (16%), and "baby not doing well" (7.5%). The NPHS (1994/1995) revealed that perceived insufficiency of milk supply was the reason given by 41% of mothers who discontinued to breastfeed within the first five weeks postpartum (Dzakpasu & Trouton, 1998).

At three months postpartum, the NPHS reported that perceived insufficiency in milk supply continued to discourage mothers from breastfeeding for the recommended four to six months. Evers, Doran, & Schellenberg (1998) found that discontinuing breastfeeding at three months postpartum included such statements as "not enough milk" (13%), "baby rejected it" (13%), and "baby seemed hungry" (10%). Similarly, in the Dzakpasu and Trouton (1998) study, insufficient milk supply was the reason expressed by 37% of women to explain weaning their child prematurely (Dzakpasu & Trouton, 1998). Mothers often incorrectly assume that they cannot meet the nutrition needs of their infants beyond three months of age. Ruowei and colleagues (1998) discovered that 31% of adults in the United States believe infants should be fed solid food by three months of age. Furthermore, the ELDEQ 1998-2002 revealed that the mean age at which solid foods were introduced to infants in Quebec was three months, reflecting the misconception that exclusive breastfeeding for up to six months is inadequate.

Between four and six months, the most common reason for cessation of breastfeeding is the return to work or school (Matthews *et al.*, 1998, and Bourgoin *et al.*, 1997). The Ross Laboratories survey of mothers found that, after 6 months, only 10% of mothers working full-time for paid employment were breastfeeding, compared to 28% of their unemployed counterparts (Ryan, 1989 as cited in Meek, 2001). Therefore, the duration of breastfeeding is strongly negatively correlated with maternal working status. The decision to formula feed upon returning to work may be partially due to a lack of prenatal education and preparation, as well as a lack of "baby friendly: workplaces (Wyatt, 2002).

2.5. Barriers to Breastfeeding

One of the more extensive, recent reviews of barriers to breastfeeding is that of Dennis (2002). In her review of the literature, Dennis (2002) identified the following categories: personal characteristics, attitudinal and intrapersonal characteristics, hospital policies and intrapartum experience, sources of support, and breastfeeding interventions. According to Dennis (2002), if any of the factors listed above are not addressed or is experienced negatively, the factor will become a barrier to successful breastfeeding (Dennis, 2002).

2.5.1. Personal Characteristics

The Ontario Mother and Infant Survey conducted by Sheehan and colleagues in 2001 revealed that the lowest breastfeeding initiation rates were among participants who were of lower socioeconomic status, younger in age, less educated, and more likely to be first time mothers. Table 2.8. outlines general characteristics shared by women who breastfeed in developed countries.

Table 2.8. General characteristics shared by women who breastfeed in developed countries (Dennis, 2002)

Characteristic	Reference
White race	Jacobson, Jacobson & Frye, 1997; Ryan, 1997
Higher socioeconomic status	Bourgoin *et al.*, 1997; Matthews *et al.*, 1998; Ryan, 1997
Well-educated	Barber *et al.*, 1997; Evers, Doran, & Schellenberg, 1998; Scott, Aitkin, Binns, & Aroni, 1999
Married	Evers *et al.*, 1998; Pande, Unwin, & Haheim, 1997
Older	Evers *et al.*, 1998; Hammer, Bryson, & Agras, 1999; Pande *et al.*, 1997
Non-smoker	Nolan & Goel, 1995
Not employed outside the home	Bick *et al.*, 1998; Kearney & Cronenwett, 1991
Increased parity	Pande *et al.*, 1997; Ryan, 1997
Attended prenatal classes	Evers *et al.*, 1998; Piper & Parks, 1996
Mother of a healthy full-term infant	Lawson & Tulloch, 1995; Pande *et al.*, 1997; Ryan, 1997
Friends or family with breastfeeding experience	Libbus *et al.*, 1997; Wiemann, DuBois, & Berenson, 1998
Successful previous breastfeeding experience	Barber *et al.*, 1997; Bourgoin *et al.*, 1997

2.5.1.1. Socioeconomic Status

A study by Cropley & Herwehe (2002) of women who delivered in one of nine hospitals in Louisiana identified the importance of income and ethnicity as possible barriers to breastfeeding. A statistically significant negative correlation was found between breastfeeding

rates and income level, and significance was maintained when a partial correlation between rates of breastfeeding and income level, controlling for African-American ethnicity, was performed.

A comparison of breastfeeding initiation rates across socioeconomic status categories was observed to be proportionally different within the province of Quebec. Sixty-three percent of mothers classified as receiving government allowance also breastfed, while 73% of mothers classified as having a higher income status were reported to breastfeed (ELDEQ, 1998-2002).

A similar study conducted by Williams *et al.* (1996) in Canada showed that as socioeconomic status was determined to be high, so too were rates of breastfeeding within a cohort. Williams *et al.* (1996) showed the following proportion of breastfeeding initiation rates relative to household income:

Table 2.9. A comparison of breastfeeding initiation rates and household income (Williams *et al.*, 1996)

Household Income per annum (Cdn)	Breastfeeding Initiation Rate
<$10, 000	46%
$10, 000-19, 999	60%
$20, 000-29, 999	76%
$30, 000-50, 000	78%
>$50, 000	88%

2.5.1.2. Maternal Age

Age is also an important factor influencing the decision to initiate breastfeeding. In 1990, US national surveys revealed initiation rates of 39% for teenage mothers compared to 86% for mothers over the age of thirty (Ineichen, B., Pierce, M., & Lawrenson, R., 1997). Breastfeeding

initiation rates in Canada in 1994/1995 were 67% among mothers aged twenty to twenty-four compared to 75% among mothers aged thirty-five to forty-four (Statistics Canada, 2001). A study by Nolan & Goel (1995) on breastfeeding initiation rates in Ontario also found the lowest initiation rates among mothers under the age of twenty-five.

2.5.1.3. Maternal Education

Maternal education is correlated with increased breastfeeding initiation rates as demonstrated by ELDEQ (1998-2002). Women with a university degree are more likely to initiate breastfeeding, (92%), while approximately 72% of mothers with a high school diploma initiate breastfeeding, and 60% of mothers with no high school diploma initiate breastfeeding (ELDEQ, 1998-2002). Williams *et al.* (1996) studied breastfeeding initiation in Vancouver, British Columbia, and found significant differences in breastfeeding initiation between women with a high school education or less (approximately 52%) and women with a college (78%) or university education (91%). The work by Ruowei *et al.* (2002) supports findings that higher maternal education is associated with an increased proportion of the mothers choosing to breastfeed. According to Ruowei *et al.,* only three subgroups of women met the Healthy People 2010 objective of having at least 75% of mothers breastfeed at some time: women who had graduated from college (82%), those who lived in a household headed by a college graduate (80%), and those in the highest income category (75%).

2.5.1.4. Ethnicity

Special consideration and care must be provided to newly immigrated women facing the decision to breastfeed (Kannan *et al.*, 1999). By leaving her native country, a new mother is

faced with the reality of having to make many important decisions without the support of her community (Denman-Vitale & Murillo, 1999).

2.5.1.5. Smoking Status

Approximately one fourth of pregnant women in developed countries smoke (Lumley, Oliver, and Waters, 2001 as cited by Dennis, 2002). In the McLeod *et al.* (2002) study women were less likely to intend to breastfeed if they smoked. Dennis (2002) cited three studies comparing smoking status and breastfeeding rates among women. Haug *et al.*, (1998), as cited by Dennis (2002), completed a random survey of 24,438 Norwegian women and reported that women who did not smoke were twice as likely to continue breastfeeding at six months as were women who smoked. In a randomized controlled trial of 228 Canadian mothers who participated in a smoking relapse prevention trial, 65% of the women who relapsed to daily smoking stopped breastfeeding before 26 weeks postpartum compared with 34% of women who remained abstinent or smoked occasionally (Ratner, Johnson, & Botorff, 1999 as cited by Dennis, 2002). Furthermore, in studies that controlled for intended duration of breastfeeding, education, and return to paid employment, women who resumed daily smoking were almost four times more likely to wean early than were women who abstained or smoked occasionally (Horta *et al.*, 1997 as cited by Dennis, 2002).

2.5.1.6. Maternal Employment

The prospect of needing to go back to work or school discourages some mothers from attempting to breastfeed (Guttman & Zimmerman, 2000). Returning to work was the barrier to exclusive breastfeeding mentioned most frequently (76.5%) by the women in a study of 51 mothers in Nova Scotia (Hogan, 2001). Although re-entering the workforce was discussed in a

limited way in a study by McIntyre, Hiller, & Turnbull, (1999) (since many of the participants were not in paid employment), most believed that if a mother was working she would most likely bottle feed her baby. In a study of 1007 mother-infant pairs, returning to work or school progressively became the greatest reason for breastfeeding discontinuation by 10 to 12 weeks (Taveras, Capra, Braveman, & Jensvold, 2003). The proportion of mothers in this study who cited return to work as the main reason for breastfeeding discontinuation increased from 14% at 2 to 3 weeks to 58% at 10 to 12 weeks postpartum. The most prevalent of problems reported among women who returned to work were restricted schedules and breaks (51%), and insufficient privacy (20%); women returning to school (23%) cited the absence of on-site child care as a barrier to breastfeeding continuation (Taveras *et al.*, 2003).

The results of these studies mirror the findings of the Ross Mother's Survey, reported that of women employed full time, 22% breastfeed their infants at six months of age compared to 35.4% of women not employed (Libbus & Bullock, 2002). This trend continued to 12 months of age, when 10.6% of full-time workers continued to breastfeed compared to the non-employed women of whom 22% breastfed (Libbus & Bullock, 2002). The number of teenaged and single mothers and families' reliant on childcare outside the home are also associated with challenges to successful sustained breastfeeding. Other powerful forces negatively affecting sustained breastfeeding are women's relatively short-term maternity leave, inflexible work hours when returning to work, and the lack of paid breastfeeding or pumping breaks in the workplace.

2.5.2. Attitudinal and Intrapersonal Characteristics

2.5.2.1. Prenatal Intentions

Numerous studies have reported that between 50% and 75% of expectant mothers decide

how they will feed their infants before or very early in pregnancy (Losch *et al.*, 1995 as cited by Dennis, 2002). When twenty-five African-American adolescent women between the ages of 15 and 21 years were asked about their beliefs on breastfeeding in a study by Head *et al.* (2002), the majority (16/25) reported making their feeding decision during pregnancy. Nine of these 16 women chose their feeding method in their first trimester of pregnancy, four of them decided in their second trimester, and three of them in their third trimester. Six of the 25 women reported that their feeding decision was made at delivery and only three of the women surveyed decided their feeding method before becoming pregnant (Head *et al.*, 2002)

In general, the earlier the decision to breastfeed is made, the greater the likelihood of initiation and longer duration. As well, there is a consistent association between intended and actual duration of breastfeeding (Dennis, 2002). If ambivalence is expressed about whether to breastfeed during pregnancy, the likelihood of weaning in the early weeks after birth is greatly increased (Wiemann *et al.*, 1998 as cited by Dennis, 2002). The association between intention to breastfeed and duration of breastfeeding was exemplified in a prospective study of 665 women by McLeod *et al.* (2002). At 20 to 24 weeks gestation, 74% of women intended to exclusively breastfeed their infants. Sixty-seven percent of women were successful in their intention to breastfeed fully at 6 to 10 weeks postpartum. Of the women who intended to exclusively breastfeed when asked at 20 to 24 weeks gestation, 53% were still exclusively breastfeeding or breastfeeding with solids at 16 to 20 weeks postpartum, with an additional 26% breastfeeding in conjunction with bottle-feeding (McLeod *et al.*, 2002).

2.5.2.2. Maternal Attitudes and Confidence

In a study of 434 mothers from Vancouver, personal choice was the primary factor for the decision to breaastfeed (Williams *et al.*, 1999). Personal choice was also cited with increasing frequency in this cohort as the duration of breastfeeding increased: by 53% of mothers who breastfed less than three months; 62% of those who breastfed three to eight months; and 79% of mothers who breastfed for longer than eight months (Williams *et al.*, 1999). In a study by Head *et al.* (2002), adolescent mothers were receiving adequate knowledge about the benefits of breastfeeding, but were not choosing to act on this information. These teenagers were concerned with body image (as appropriate for their age group), which resulted in feeling self-conscious when exposing their breasts to breastfeed. Since they were not comfortable exposing their breasts in public, breastfeeding was viewed as restrictive (Head *et al.,* 2002).

Consistent with other studies, women are more likely to breastfeed if they have a positive attitude towards breastfeeding, and believe it to be healthier, easy, convenient, and conducive to freedom (Dennis, 2002). Mothers are more likely to formula feed when they have negative attitudes about breastfeeding. The negative attitudes include perceiving that breastfeeding causes a restriction on lifestyle, physical discomfort, that breastfeeding is inconvenient, or that breastfeeding results in feelings of shame, or embarrassment (Dennis, 2002).

O'Campo *et al.* (1992), as cited by Dennis (2002) reported that women with low confidence in their ability to breastfeed were three times more likely to discontinue breastfeeding when compared with women who were very confident breastfeeding. Similarly, Buxton *et al.* (1991) as cited by Dennis (2002) stated that 27% of women who ranked themselves as having low confidence in their ability as a mother during pregnancy discontinued breastfeeding within the first week postpartum in comparison with only 5% of the highly confident women.

Women are affected by the perceptions of their support systems, and by public perception (Ruowei *et al.*, 2002). Research by Scott, Binns, and Arnold (1997) identified the societal attitudes to breastfeeding in Australia that may have a negative impact on breastfeeding duration. Ten focus groups comprised of a total of n=79 participants were grouped in the following cohorts: mothers of infants and small children (n=22), fathers of infants and small children (n=7), male university students (n=25), adolescent girls (n=18), and Nursing Mothers Association of Australia (NMAA) members and lactation counsellors (n=9). The mothers and fathers of infants and small children felt that breastfeeding in public was routine, necessary, and often unavoidable during infancy. The male university students considered it appropriate, under certain conditions, for women to breastfeed in public. They were supportive of breastfeeding in public when there was no alternative private location. This cohort agreed that their embarrassment for witnessing a woman breastfeeding stemmed from the sexual role of the breast. The adolescent girls were least supportive of breastfeeding in public. These teenagers generally did not believe that there was any situation in which it was appropriate for a mother to breastfeed her child in public. Interestingly, every adolescent girl planned to breastfeed her own children in the future. The NMAA members and counsellors were supportive of breastfeeding in public, but stressed that it was important to do so discretely. All of the groups stated that breastfeeding in public should be discrete (including the NMAA cohort) and that breastfeeding should not continue into the toddler years.

In a study by Ruowei *et al.* (2002), more negative perceptions about breastfeeding were observed among non-whites, people under 30 or older than 65 years, and those who had low income and less education. Pollock *et al.* (2002) assessed the knowledge and attitudes of

breastfeeding in a cohort of 100 men. The men displayed some belief in common myths (e.g. women with small breasts cannot breastfeed), but received relatively high scores in all areas except those concerned with maternal diet while breastfeeding and the specific benefits of breast milk (Pollock *et al.*, 2002).

2.5.3. Hospital Policies and Intrapartum Experience

2.5.3.1. Intrapartum Experience

Research indicates that a woman's obstetric experience may influence her breastfeeding behaviours (Dennis, 2002). There have been reports of a negative association between Caesarean delivery and breastfeeding initiation (Ever-Hadani *et al.*, 1994 as cited by Dennis, 2002), however, not duration once breastfeeding has commenced (DiMatteo *et al.*, 1996 as cited by Dennis, 2002).

2.5.3.2. Early Breastfeeding Initiation

Although the literature is inconclusive as to whether there is a critical period for the first feeding in relation to breastfeeding success, according to the *Ten Steps to Successful Breastfeeding* developed by the WHO and UNICEF, maternity services should assist mothers to initiate breastfeeding within a half hour of birth (Dennis, 2002).

2.5.3.3. Rooming-In

The practice of separating mothers and newborns after birth declined as rooming-in became a more accepted hospital policy, however newborn nurseries still exist (Dennis, 2002). Rooming-in is believed to be advantageous to breastfeeding because it promotes demand feeding (2- to 3- hour feeding intervals) (Dennis, 2002). Buxton *et al.* (1991) as cited by Dennis (2002)

found that women were three times more likely to discontinue breastfeeding if they did not room-in with their infants.

2.5.3.4. Supplementary Feedings

Supplementary feedings with formula during the first few days after birth has been associated with an increased risk of breastfeeding failure (Dennis, 2002). A cross-sectional survey of 227 Canadian women concluded that infants who did not receive supplementation in the hospital were 2.49 times more likely to breastfeed for at least 6 weeks than infants who received supplementation (Sheehan *et al.*, 1999).

2.5.3.5. Breast Pumps

The effect of distributing discharge packs to new mothers is commonly debated in the literature (Dennis, 2002). Dungy *et al.* (1992) as cited by Dennis (2002) reported that the content of discharge packs does affect the initiation and duration of breastfeeding, since the inclusion of a breast pump rather than formula increased the duration of breastfeeding at eight weeks postpartum.

2.5.3.6. Early Hospital Discharge

Breastfeeding failure is associated with short hospital stays (Gagnon, Dougherty, Jimenez, & Leduc, 2002).

2.6. Sources of Breastfeeding Support for Pregnant and New Mothers

2.6.1. Support for Mothers During Pregnancy and Breastfeeding Initiation

Breastfeeding initiation and duration will increase if a mother has realistic expectations about breastfeeding, access to consistent information, and quality ongoing support from partners, family, friends, professionals, and the community (McLeod, 2002). According to Dennis (2002) and McLeod *et al.* (2002) the support of professionals, health services, family, friends, employer, and the general public provided to a mother choosing to breastfeed is paramount in her confidence and ultimate success in breastfeeding.

2.6.2. Policies Designed to Provide Support for Breastfeeding

Both the World Health Organization and UNICEF emphasize the need for hospital staff and decision makers/administrators, along with all health care professionals to support and encourage breastfeeding initiation and extend the duration of breastfeeding (Humenick & Gwayi-Chore, 2001; Levitt *et al.*, 1996). An initial document, *International Code of Marketing of Breast-Milk Substitute,* produced by the WHO and UNICEF (1981) was designed to control the promotion and distribution of formula within hospitals (Levitt *et al.*, 1996, Appendix 1). A number of industrialized countries adopted the principles outlined in the document and especially recognize agreements with manufacturers and government prohibition to terminate the distribution of free and low-cost formula in hospitals (Humenick & Gwayi-Chore, 2001; Beaudry, 2000).

A second document, entitled the *Ten Steps to Successful Breastfeeding*, was developed in 1989 (Levitt *et al.*, 1996). This is an international statement outlining policies and practices, with

the goal of promoting breastfeeding in hospitals (Humenick & Gwayi-Chore, 2001; Levitt *et al.*, 1996).

In 1990, the *Innocenti Declaration* was written (Humenick & Gwayi-Chore, 2001) which suggested that all governments develop national breastfeeding policies and set appropriate targets for the 1990s (Levitt *et al.*, 1996). The *Innocenti Declaration* also recommended that all countries appoint a national breastfeeding coordinator (who would oversee the designation of Baby Friendly hospitals) and establish a multi-sectoral national breastfeeding committee (Beaudry, 2000). The Baby Friendly Hospital Initiative (BFHI) was launched in 1991 by WHO and UNICEF, and based on the *International Code of Marketing of Breast Milk Substitutes*, the *Ten Steps to Successful Breastfeeding*, and the *Innocenti Declaration* (Levitt, 1996). The BFHI is the leading worldwide initiative working to create an optimal environment for breastfeeding in hospitals (Beaudry, 2000).

2.6.3. Support Provided During Breastfeeding Initiation

2.6.3.1. Spouse and Family Support During Breastfeeding Initiation

Although the child's maternal grandmother has an important influence on the decision to breastfeed, the support and opinion of the mother's spouse or partner is often the most significant influence in her decision to breastfeed (ELDEQ, 1998-2002). In Quebec, breastfeeding initiation rates for mothers who received support from their spouse/partner for breastfeeding were 83% compared to 21% for mothers whose partners did not support breastfeeding (ELDEQ, 1998-2002).

In a survey conducted by Pollock *et al.* (2002), knowledge and attitudes about breastfeeding held by males (n=100) of diverse cultural backgrounds was collected. Eighty-one percent of the sample wanted their baby to be breastfed. Over 90% agreed that breastfeeding promotes mother/infant attachment, stating that they would support their partner if she chose to breastfeed. The study also showed that males who were breastfed were more likely to want their baby to be breastfed (Pollock *et al.*, 2002).

2.6.3.2. Professional Support During Initiation

Research by Starbird (1991) examining influences on breastfeeding found that women who received information on the benefits of breastfeeding from a medical professional were 3.5 times more likely to initiate breastfeeding than those who received no information. Matthew *et al.* (1998) reported that 19% of mothers felt that health professionals, such as physicians, public health nurses, midwives, or pre-natal instructors, had the most influence in their feeding outcome.

According to a study by Williams *et al.* (1999), 37% of women's perceptions and decisions about breastfeeding are affected by their stay experience in the hospital. The BFHI encourages hospitals and birthing centers to examine their practices, make changes to provide an optimal environment for breastfeeding, and then apply for recognition as a Baby Friendly Hospital (Humenick & Gwayi-Chore, 2001) The BFHI has been adopted in approximately 161 countries, including 135 developing countries and 26 industrialized countries (Beaudry, 2000). Globally, there are 14, 994 hospitals identified as "Baby Friendly"; 262 are found in industrialized countries (UNICEF, 2002). The majority of the world's Baby Friendly hospitals

are found in China and Nigeria, with a total of 6,312 and 1, 147 Baby Friendly hospitals, respectively (UNICEF, 2002).

In Canada, only two hospitals (of approximately 576 hospitals that provide maternity care) have received an official 'Baby Friendly' designation (Dunlop, 1995): the Brome-Missisquoi-Perkins Hospital in Cowansville, Quebec (McHale & Gutmanis, 1999) and St. Joseph's Healthcare in Hamilton, Ontario (Natural Health Magazine, 2003). Across Canada, hospitals are striving to gain Baby Friendly status. In British Columbia alone, over twenty hospitals have committed to the process (World Breastfeeding Initiative, 1995), and several other Canadian hospitals are very close to requesting an assessment (Natural Health Magazine, 2003).

Martens *et al.* (2000) highlighted some areas where the *Ten Steps* were not being followed during a provincial feeding study (n=633) of Manitoba hospitals. Less than half of the women (49%) were told about the benefits of breastfeeding or breastfed their child within the hour following delivery. Many infants were supplemented in the hospital (61%), provided with pacifiers (49%), many nurses advised a two-hour waiting period before feedings (62%), and a limited time at each breast (52%). Less than half of the infants (31%) stayed in the room with the mother (practice of "rooming-in") overnight, and less than half of the mothers were referred to breastfeeding support groups (47%). Many of the hospitals used subsidized formula supplies (83%), with mothers noticing a formula brand name in the hospital (28%). Only 63% of the maternity facilities had written breastfeeding policies, and only half of the policies were based on the *Ten Steps to Successful Breastfeeding* (Martens, Phillips, Cheang, & Rosolowich, 2000).

In a study by Levitt *et al.* (1996), there were vast inconsistencies in the adoption of the BFHI in facilities across Canada. Quebec and the Prairie provinces were significantly less likely

than those in Ontario to have a written policy or to have policies based on the *Ten Steps*. The hospitals in the Prairie provinces and those in Quebec were also significantly more likely to give free sample packs to formula feeding mothers. In addition, the hospitals in Quebec were significantly less likely than those in Ontario to have policies supporting 19 to 24 hours per day of rooming-in (Levitt *et al.*, 1996).

Philipp *et al.* (2001) compared breastfeeding initiation results before, during, and after achieving Baby Friendly status. Adopting the *Ten Steps* had positive outcomes; initiation rates increased from 58% in 1995 (before BFHI policy) to 77.5% in 1998 (during implementation) and 86.5% following adherence to the BFHI policy. For those breastfeeding exclusively, initiation rates increased from 5.5% (1995) to 28.5% in 1998 and 33.5% in 1999 (Philipp *et al.*, 2001). The benefits of the BFHI can be broadened by extending the BFHI to community health centers, as has been done in areas of the United Kingdom and Canada (Radford, 2001).

As health care professionals, nurses may have the most contact with new mothers and thus have a great opportunity to help a mother achieve successful breastfeeding (Gill, 2001). According to Gill, nurses play a vital role in supporting the mother during the initial feeding. If nurses cannot stay for the entire initial feeding, Gill suggests that they should stay until the baby latches on, long enough to make sure the newborn is rhythmically sucking, and be present for any difficulties and/or questions that may arise. The nurse can then check back in 15 to 20 minutes to help the mother reposition the infant on the second breast. Gill also states that nurses must review current research and provide information (verbally rather than in written form) based on current evidence, rather than personal opinion or experience.

Taveras *et al.* (2003) report that the women (n=1163) included in their study were exposed to many support programs and services before and after childbirth. These services included: breastfeeding classes (predominantly in the prenatal period); instructional videos; and written and verbal breastfeeding information during their postpartum hospital stay. Individualized instruction was chosen by 49% of respondents as the most helpful service actually received in support of breastfeeding and named by 63% of respondents as the most helpful service that they could have been offered by their health care professionals (Taveras *et al.,* 2003).

According to Walton and Edwards (2002), 75% of the male primary care pediatricians felt not or only somewhat confident managing breastfeeding issues, compared with 64% of the female primary care pediatricians. Three or four months was felt to be the right amount of training according to the residents (72% to 75%, where n=559), with bedside teaching by faculty (69%), bedside teaching by residents or fellows (38% and 35%, respectively), rounds (53% found them very helpful), and lectures (34% stated they were very helpful) being rated the best teaching methods.

2.6.4. Support for Breastfeeding Mothers–Support for the Duration of Breastfeeding

2.6.4.1. Support Provided by the Spouse/Partner

The support provided by an infant's father has been identified as one of the strongest indicators of success in breastfeeding (Cohen, Lange, & Slusser, 2002). Peregrin (2002) states that a father's belief that breastfeeding is best for the baby, rather than being ambivalent or against breastfeeding, can be as strong a predictor of breastfeeding as the mother's beliefs. Since male partners have a strong influence in the decision to breastfeed and the duration of

breastfeeding, many programs are being developed to help support men in understanding and supporting breastfeeding (Cohen *et al.*, 2002). The Fathering Program in Los Angeles, studied by Cohen *et al.* (2002), has had encouraging results; the breastfeeding duration rates were over three times higher for the partners of the men enrolled in the program (69%) than the national average (21.7%) in 1996. Infants of the fathers who participated in the Fathering Program were breastfed for an average of eight months. Only 4% of the mothers stopped breastfeeding at 1 month of age or earlier (Cohen *et al.*, 2002).

2.6.4.2. Peer Support

Lawrence (2002) states that lack of support and assistance for women after leaving the hospital contributes to lower rates of exclusive breastfeeding for the recommended duration of six months. Lawrence suggests that peer support increases duration rates and notes that although the BFHI recommends referral to breastfeeding support groups, efforts have been focused on increasing the number of women breastfeeding their child at hospital discharge.

Peer support programs are intended to provide mothers with one-on-one support from other mothers who have breastfed successfully; methods of support may include home visits, peer-counseling classes, and/or telephone contact (Peters, 1997). In a study by Peters (1997), counselors contacted new mothers by phone within the first week postpartum. Results exhibited an increase from 40% to 53% in exclusive breastfeeding, and a decrease from 43% to 32% in combining formula feeding with breastfeeding (Peters, 1997).

Dennis (2002) reported that mothers who participated in a peer support group were 2.5 times more likely to continue breastfeeding at three months postpartum. Eighty-one percent of

the mothers (n=130) who received peer volunteer support were breastfeeding at 3 months postpartum, as compared with 66.9% of mothers in the control group. These results continued at 4, 8, and 12 weeks postpartum. Significantly more mothers in the peer support group were exclusively breastfeeding at 12 weeks, indicating that breastfeeding duration and exclusivity were affected by peer support. Furthermore, repeated contact with peer counselors was associated with increased rates of exclusive breastfeeding and increased breastfeeding duration (Morrow *et al.*, 1999, as cited by Dennis, 2002).

Peer counseling is central to La Leche League and many other breastfeeding advocate organizations (Lawrence, 2002). One obstacle that La Leche League encountered was that women who joined the League were well-educated, professional, and knowledgeable individuals. The result was that women with lower-income and less education were not the peers of the La Leche League volunteers and were unserved by this volunteer group (Lawrence, 2002). By training volunteers with lower socio-economic status, the lack of peer volunteers was improved; all groups of women will have a peer in the program and thus receive peer support (Lawrence, 2002).

2.6.4.3. Professional Support

The support of professionals working with new mothers and their infants is vital in helping mothers to feel comfortable in their ability to breastfeed and to be confident in contacting other professionals for future help as required (Gill, 2001). Women who reported that their health care providers encouraged them to breastfeed were approximately half as likely to discontinue breastfeeding by 12 weeks postpartum than those who did not (Taveras, 2003).

It is important that before the new mother leaves the hospital, she and a health professional discuss issues that may arise during breastfeeding and the services within the community that are available to help the mother with any future questions or concerns (Taveras, 2003). Nurses may need to educate the support person with accurate information and specific techniques for facilitating breastfeeding (Gill, 2001). Information about community resources, with telephone numbers for breastfeeding assistance after discharge, are helpful (Gill, 2001). Moxley (1994) states that mothers who leave the hospital feeling confident about breastfeeding are more likely to breastfeed for their intended duration than mothers who leave hospital lacking confidence about their ability to breastfeed.

Stefuk *et al.* (2002) completed a process evaluation of a Saskatoon Breastfeeding Center fully staffed by lactation consultants. The Center provides in-person and phone support for new mothers. Mothers (n=68) using the services reported being very satisfied with the services provided to them, with most women (39/43 of respondents in the personal contact group and 24/25 of the respondents in the telephone contact group) reporting that the information and support provided to them at the Center was sufficient in helping them to breastfeed for the entire duration that they were hoping (Stefuk *et al.*, 2002).

2.6.4.4. Support for Mothers of various ethnic backgrounds

As mentioned previously, mothers from various ethnic backgrounds must overcome unique barriers to breastfeeding, especially once immigrating to a new country.

2.6.5. Support from Community: Breastfeeding in Public and Support of Employers

2.6.5.1. Breastfeeding in the Workplace

The Bureau of Labor Statistics reported that in 2000, 51% of U.S. women with children under one year of age were employed outside the home; 67% were employed full-time (Libbus & Bullock, 2002). Cohen *et al.* (2002) and Prince (2002) state many advantages for employers providing breastfeeding promotional programs, including: a reduction in absenteeism from work, improved recruiting and retention rates, increased productivity at the work site, reduced infant health care expenses, and reduced maternal stress.

While exploring large and small employers' thoughts on breastfeeding, Brown *et al.* (2001) were able to identify some key areas that need support and/or change in order to accommodate mothers choosing to breastfeed. The support of the employer is related to a positive experience for the breastfeeding mother. Participants noted that breastfeeding mothers lacking support from their employers experience decreased wellness and productivity, and are more likely to quit their job due to increased stress. Employers also acknowledged that breastfed infants are less likely to suffer from health-related problems, and that this might contribute to fewer claims for providers of health insurance (Brown *et al.*, 2001).

The employers studied by Brown *et al.* (2001) realized that a private, appropriate spot was needed for mothers to be able to breastfeed or express milk. Some of the employers, however, felt that a washroom stall was adequate for a mother to use. Time constraint was an issue for many employers, who worried about accommodating the breastfeeding women on staff.

2.6.5.2. Breastfeeding in Public

In a study by Mackay (2002), almost every woman had the desire to breastfeed, but most were uncomfortable doing so in public. This lack of comfort was also reported in a study by Stopka *et al.* (2002), where the most common reason stated for not breastfeeding, or stopping before six months postpartum, was the embarrassment of breastfeeding in public.

Sheeshka *et al.* (2001) studied women's feelings about breastfeeding in public places. Mothers described their insecure feelings about breastfeeding as "vulnerable", "self-conscious", and "nervous". Words used by the sample to describe the attributes that a woman who successfully breastfeeds in public must display included "determination", "confidence", and "commitment to breastfeeding".

The analysis completed by Sheeshka *et al.* (2001) reported that breastfeeding women were more likely to get neutral (neither positive nor negative) looks from restaurant customers than were formula feeding women, but that no differences in other types of looks or comments from customers or staff were exhibited. Very few people (approximately 3%) even noticed mothers while they were breastfeeding in malls, and among those who did notice, the reaction was neutral (Sheeshka *et al.,* 2001).

The focus group participants studied by Sheeshka *et al.* (2001) noted that planning ahead for a comfortable level of discretion was important, and recommended other proactive behaviours for new mothers to try. Behaviours included going out with a friend while breastfeeding in public, "tuning things out", practicing latching at home, and waiting until breastfeeding is well established before trying it in public locations.

Scott, Binns, & Arnold (1997) reported that although the participants included in their study (from various age groups and both genders) were supportive of breastfeeding, there were conditions placed on this acceptance. The cohort studied by Scott *et al.* generally felt more comfortable when a woman asked permission to breastfeed in their presence or acknowledged that she would be breastfeeding in front of them (the fathers in the group strongly resented the belief that a mother should ask permission). Breastfeeding was regarded as more acceptable in public when less of the breast was visible. Although general acceptance of breastfeeding in public was displayed, Canadian teenagers did not consider it appropriate to breastfeed "on the bus", in "restaurants", "the park", or "at the shops" (Scott *et al.,* 1997).

3.0. Methodology

3.1. Northern Ontario Perinatal Child and Health Survey

This secondary data analysis uses information collected in the Northern Ontario Perinatal and Child Health Survey (NOPCHS). Designed to provide information for planning perinatal and child-focused programs and service planning for Northern Ontario and individual health units, the NOPCHS addressed six main topic areas. The eight Northern Ontario health units include: the North Bay and District Health Unit, Northwestern Health Unit, Sudbury and District Health Unit, Timiskaming Health Unit, Algoma Health Unit, Thunder Bay District Health Unit, Porcupine Health Unit, and Muskoka-Parry Sound Health Unit. Survey topics included: breastfeeding, parenting, unintentional injuries and safety, asthma, food security, and prenatal and child nutrition. The NOPCHS contained over seventy questions directly pertaining to breastfeeding experiences and beliefs, with many other questions providing information on socioeconomic status, employment, education level, household income, age of mother, age of child and geographic location.

3.2. Questionnaire Development

The main objective of the first phase of this project was to develop a valid and reliable questionnaire that could be used in a telephone survey to collect data about perinatal and child health.

Potential survey questions were obtained from various organizations including Health Canada, Statistics Canada, and the Northern Ontario health units. Input from officials at the

previously mentioned organizations provided feedback about survey content. Wherever possible, questions for the survey were drawn from existing tools that have a demonstrated level of reliability and are valid for use in community samples, e.g. National Longitudinal Survey of Children and Youth, and the National Population Health Survey–Child Health Module.

A Delphi process was used to discuss the selection and organization of questions in each of the six identified topic areas. The final questionnaire was submitted for ethical review and necessary changes were made. The questionnaire was then sent to an accredited translator to be translated into French.

3.3. Data Collection

Data was collected between March and June 2002, with potential participants being contacted by telephone during the day, evening, on weekdays and weekends. Interviews were conducted in both English and French by Oraclepoll Research Limited.

Since several topic areas, such as breastfeeding and folic acid intake during pregnancy, were specific to women, only mothers were contacted for the survey. The telephone survey targeted Northern Ontario mothers of children aged 0-6. For mothers with more than one child aged 0-6, the survey focused on the child who had the most recent birthday in the family. This approach ensured an equal chance of selection among the eligible children in a family.

3.4. Sample Size

The sample for the NOPCHS was drawn from two sources, the Integrated Services for Children Information System database, and random digit dialing. In the NOPCHS sample, 56%

of participants were recruited from consenting ISCIS contacts and 44% from random digit dialing. The total sample for this survey was 3413 participants, with approximately 400 participants from each health unit area. The average refusal rate for the ISCIS sample was 20%. Among the general population, 5% of the eligible respondents (families with children under 7 years) refused to participate in the survey.

3.5. Data Analysis

Using SPSS 11.0, all data was entered into a spreadsheet format. Frequency distributions were completed for all questions of the NOPCHS relating to breastfeeding. Variables were cross-tabulated to compare like variables and to provide a more thorough study of the information provided by respondents. Regression analyses were used for the dependent variables breastfeeding initiation and breastfeeding duration. Predictor sets were based on the literature, divided into categories and correlational comparisons were used in an attempt to avoid multi-colinearity. The predictor sets are outlined below.

Predictors of Breastfeeding Initiation
Question 22 How were you feeding him/her in the first 48 hours after his/her birth?
Q 23 Do you have a family doctor?
Q 24- 43 Did you receive support for the way you chose to feed him/her from the following people? How helpful were the following people? • Your baby's doctor • Midwife • Prenatal educator • Hospital nurses • Nurse practitioners • Spouse/partner • Family/close friends • Lactation consultant

Q 44 We are interested in the reasons that women choose to breastfeed. Please tell us why you chose to breastfeed your baby: • Benefits for baby • Benefits for self • Convenience • Bonding • Successful previous experience • Support from partner • Support from non-partner • Cost efficacy • Desire to be 'natural' • Wanting the experience • Pressured by others • Cultural/family tradition • Other
Q 51 Why did you decide to bottle-feed?
Q 77, 78, 80 How important is it for mothers who breastfeed or express milk to have a special place in: • Malls • Restaurants • The workplace
Q 86 Were prenatal classes available in your community?
Q 88 How did you receive your prenatal information? • Public health nurse • Doctor • Midwife • Reading • Friends • Nurse Practitioner • Other
Q 89 Who was your main health care provider during your pregnancy? • Family doctor • Midwife • Obstetrician • Nurse practitioner • No one or no consistent person • Other
Q 90 After how many months of pregnancy did you first go for prenatal care?

Q 96 During your pregnancy, were you aware of, or did you become aware of any of the following community resources: • Healthy Babies/Healthy Children program • Well Baby Drop-Ins offered by the Health Unit • Parent Child Information Line (if available) at your Health Unit • Breastfeeding Support Drop-Ins • Breastfeeding Mentorship Program • Other
Q 201 Are parenting courses/prenatal classes available close to where you live? Q 202 Have you used the program in the last year?
Q 232 For these programs just mentioned, do you feel there are any obstacles for your participation in them? • No problems • Don't need it • Don't know enough about it/need more information • Don't like the program • Cost • Inconvenient Location • Transportation • Hours of operation • Language • Lack of child care • Job • Child's health/disability • Other
Q 266 What is your date of birth?
Q 267 To which ethnic or cultural group did your ancestors belong?
Q 268 What is the language that you first learned at home in childhood and can still understand?
Q 270 How would you describe your sense of belonging to your local community? • Very weak • Somewhat weak • Somewhat strong • Very strong • Don't know/refused
Q 271 What is the last year you completed at school, college, or university?
Q 272 What do you consider to be your current main activity? (For example, working for pay, caring for family)

Q 280 Last week, did you work at a job or business? Please include part-time jobs, seasonal work, contract work, self-employment, babysitting, and any other paid work, regardless of the number of hours.
Q 281 What is your present marital status?
Q 282 How many people are supported by your family's income?
Q 283 What was your approximate family income from all sources, before taxes during the previous year January 1, 2001 to December 31, 2001?
Q 284 Do you have a partner?
Q 285 What was the last year your partner completed at school, college, or university?
Q 286 Last week, did your partner work at a job or business? Please include part-time jobs, seasonal work, contract work, self-employment, babysitting, and any other paid work, regardless of the number of hours.

Predictors of Breastfeeding Duration
Q 23 Do you have a family doctor?
Q 24- 43 Did you receive support for the way you chose to feed him/her from the following people? How helpful were the following people? • Your baby's doctor • Midwife • Prenatal educator • Hospital nurses • Nurse practitioners • Spouse/partner • Family/close friends • Lactation consultant

Q 44 We are interested in the reasons that women choose to breastfeed. Please tell us why you chose to breastfeed your baby:

- Benefits for baby
- Benefits for self
- Convenience
- Bonding
- Successful previous experience
- Support from partner Support from non-partner
- Cost efficacy
- Desire to be 'natural'
- Wanting the experience
- Pressured by others
- Cultural/Family Traditon
- Other

Q 45-50 Please use a scale of 1 to 5, where 1 is not at all comfortable and 5 is very comfortable. Upon hospital discharge (or if not born in hospital, shortly after the birth of the child), how would you describe your level of comfort with:

- Positioning of baby at breast
- Baby's latching (baby's mouth joining the breast)
- Recognizing the baby's cues
- Recognizing signs that the baby is feeding adequately
- How confident you felt about breastfeeding
- How confident you felt in recognizing signs indicating that you should seek help

Q 52 Were you shown how to prepare formula while in hospital or by midwife?

Q 53 How confident did you feel about feeding your baby when you were discharged from hospital (or shortly after the birth of the child)?

Q 55-58 Please indicate the time (in months) for the following items:

- Breastfeeding only
- Breastfeeding with formula supplements
- Breastfeeding, and bottle feeding using expressed milk
- Bottle feeding only (never breastfed)

Q 60 What was (were) the problem(s)?

- Baby fussy/crying
- Baby had jaundice
- Baby dehydrated
- Baby too sleepy
- Worried you did not have enough milk
- Sore nipples
- Mastitis
- Thrush
- Other

Q 61 Did you seek help from anyone?
Q 62 Who did you seek help from? • The breastfeeding help line • Friend, family member • Your doctor/midwife/nurse practitioner/obstetrician • Baby's doctor • Public health nurse • Lactation consultant
Q 63 Do you still breastfeed now?
Q 64 What is the main reason you stopped? • Not enough milk • Inconvenience/fatigue • Difficulty with breastfeeding techniques • Sore nipples/engorged breasts/mastitis • Illness • Planned to stop at this time • Child weaned himself/herself • Advice of doctor • Returned to work/school • Advice of partner • Formula feeding preferable • Wanted to drink alcohol • Lack of support • Other
Q 65 From the list above, what is the most important reason you stopped breastfeeding?
Q 66 Were you able to continue breastfeeding for the length of time you intended?
Q 68 Please indicate your level of agreement with the following statement using the scale strongly disagree to strongly agree: The expectations that I had about breastfeeding were the same as what I actually experienced.
Q 69-74 How comfortable did you feel breastfeeding in the following situations. For each are please use the scale where one is not at all comfortable and five is very comfortable. • In malls • In restaurants • In the workplace • In the presence of close family
Q 77, 78, 80 How important is it for mothers who breastfeed or express milk to have a special place in: • Malls • Restaurants • The workplace

Q 86 Were prenatal classes available in your community?
Q 88 How did you receive your prenatal information? • Public health nurse • Doctor • Midwife • Reading • Friends • Nurse Practitioner • Other
Q 89 Who was your main health care provider during your pregnancy? • Family doctor • Midwife • Obstetrician • Nurse practitioner • No one or no consistent person • Other
Q 90 After how many months of pregnancy did you first go for prenatal care?
Q 96 During your pregnancy, were you aware of, or did you become aware of any of the following community resources: • Healthy Babies/Healthy Children program • Well Baby Drop-Ins offered by the Health Unit • Parent Child Information Line (if available) at your Health Unit • Breastfeeding Support Drop-Ins • Breastfeeding Mentorship Program • Other
Q 201Are parenting courses/prenatal classes available close to where you live? Q 202 Have you used the program in the last year?
Q 205 Are parent support groups available close to your home? Q 206 Have you used the program in the last year?
Q 210 Have you used the parent information line in the past year?
Q 213 Is there a family resource centre available close to your home? Q 214 Have you used the program in the last year?
Q 217 Are Health Unit clinics for child services such as: Breastfeeding clinics, Well-Baby/pre-school clinics available close to your home? Q 218 Have you used this program in the past year
Q 230 Have you used the home visit program (Healthy babies, Healthy children) in the last year?

Q 232 For these programs just mentioned, do you feel there are any obstacles for your participation in them? • No problems • Don't need it • Don't know enough about it/need more information • Don't like the program • Cost • Inconvenient Location • Transportation • Hours of operation • Language • Lack of child care • Job • Child's health/disability • Other
Q 234 How satisfied are you with the help that you receive from the supports and services available to you and your child?
Q 238 Rate how strongly you agree with the following statement (1-5): I know where to go for help in my community if I need it.
Q 265 Which of the following services, if any, did you receive from the Healthy Babies, Healthy Children program? • 48 post discharge phone call from a public health nurse • Home visit from a public health nurse after the birth of your baby • Ongoing services from the Healthy Babies, Healthy Children program • Other
Q 266 What is your date of birth?
Q 267 To which ethnic or cultural group did your ancestors belong?
Q 268 What is the language that you first learned at home in childhood and can still understand?
Q 270 How would you describe your sense of belonging to your local community? • Very weak • Somewhat weak • Somewhat strong • Very strong • Don't know/refused
Q 271 What is the last year you completed at school, college, or university?
Q 272 What do you consider to be your current main activity? (for example, working for pay, caring for family)

Q 274, 275 How flexible (flexible, somewhat flexible, or not flexible at all) is your workplace in terms of: • Being able to leave early for a family reason • Breastfeeding arrangements at work
Q 280 Last week, did you work at a job or business? Please include part-time jobs, seasonal work, contract work, self-employment, babysitting, and any other paid work, regardless of the number of hours.
Q 281 What is your present marital status?
Q 282 How many people are supported by your family's income?
Q 283 What was your approximate family income from all sources, before taxes during the previous year January 1, 2001 to December 31, 2001?
Q 284 Do you have a partner?
Q 285 What was the last year your partner completed at school, college, or university?
Q 286 Last week, did your partner work at a job or business? Please include part-time jobs, seasonal work, contract work, self-employment, babysitting, and any other paid work, regardless of the number of hours.
Q 287 Which of the following main activity/activities does your partner do?

4.0. Results and Discussion

This study intended to resolve three problem statements. First, based on information from the Northern Ontario Perinatal and Child Health Survey (heretofore referred to as "the Survey"), this study attempted to describe perceived barriers to breastfeeding within a cohort of mothers sampled from Northern Ontario. The sample consisted of 3,413 respondents representing the mothers of 1,771 male children and 1,642 female children between the ages 0 to 6. Of the women interviewed, 10.7% were breastfeeding at the time the survey was conducted. Second, the study attempted to determine the sufficiency of breastfeeding education programs. Third, the study set out to determine if the findings of the NOPCHS could provide recommendations to health planners in creating future breastfeeding programs. The findings of the present study are consistent with the literature reported, in general, for best practices for breastfeeding. *Note: all results are based on responses for the total sample for each calculation in order to provide an overview of all respondents, not just those respondents choosing to breastfeed; this includes responses of 'not applicable'. The different denominators used in this study account for the variation between some findings of this report and those published by the NOPCHS Consortium.*

4.1. Personal Characteristics of Respondents

4.1.1. Marital Status

When asked if they had a partner, 90.6% responded "yes". The majority of the respondents were married (71.2%) or common-law (17.1%).

Table 4.1. Marital status of respondents

Marital status	Frequency	Percent
Married	2427	71.2
Common-law	584	17.1
Single	281	8.2
Separated	84	2.5
Divorced	24	.7
Widowed	2	.1
Not Stated	8	.2
Total	3410	100.0

4.1.2. Socioeconomic Status

The number of people supported by the respondents' family income ranged from 2 to 14 people, with 73% supporting three or four people. Family income among respondents was organized into the following groups: $17,000 to $26, 999, $50, 000 to $59, 999, $60, 000 to $69, 999, and $80, 000 or more. Almost 16% (15.9%) did not indicate their income (See Table 4.2).

Table 4.2. Family income from all sources for 2001

Income	Frequency	Percent
Less than $17,000	252	8.8
$17,000 to $26,999	303	10.6
$27,000 to $31,999	219	7.6
$32,000 to $35,999	160	5.6
$36,000 to $39,999	157	5.5
$40,000 to $44,999	177	6.2
$45,000 to $49,999	195	6.8
$50,000 to $59,999	341	11.9
$60,000 to $69,999	293	10.2
$70,000 to $79,999	242	8.4
$80,000 or more	530	18.5
Total	2870	100.0

Similar to previous research reported by Williams *et al.* (1996), women in the Survey were more likely to initiate breastfeeding if they were from a higher socio-economic status. In

the NOPCHS, those with a family income of under $17, 000 had an initiation rate of 63%, compared to a rate of 80% for those with incomes over $80, 000.

4.1.3. Maternal Age

Numerous studies (Ineichen *et al.*, 1997; Nolan & Goel, 1995) report that mothers over the age of 30 are significantly more likely to initiate breastfeeding than those under 30. In the Survey, however, there was not a significant difference in initiation rates (76% for those over 30 and 72% for those under).

4.1.4. Maternal Education

The women included in the NOPCHS were well educated, with 59.6% of the respondents having completed college, university or post-graduate degrees.

Table 4.3. Highest level of education completed by respondent

Level of Education	Frequency	Percent	Initiated Breastfeeding* N (%)	Did not Initiate Breastfeeding*
Public school	27	0.8	17 (63%)	10 (37%)
High school	930	27.3	618 (66%)	283 (30%)
Some college	317	9.3	228 (72%)	71 (22%)
Some university	102	3.0	76 (75%)	22 (22%)
Completed college	1258	37.0	941 (75%)	278 (22%)
Completed university	596	17.5	502 (85%)	78 (13%)
Postgraduate degree	173	5.1	152 (88%)	10 (10%)
Total	3403	100.0	2534	752

*Respondents who indicated that they both breastfed and bottle-fed their infant were not included in either the "Initiated Breastfeeding" or "Did not Initiate Breastfeeding" sections. To compare with previous studies and the recommendations of WHO/UNICEF/Health Canada, it was necessary to include only those who breastfed exclusively.

According to work by Ruowei *et al.* (2002), the higher the mother's education, the higher the resulting rate of breastfeeding initiation. The results of the NOPCHS support the earlier research as shown in the table above. With each level of education completed the relative proportion of individuals who indicated breastfeeding initiation was higher.

4.1.5. Ethnicity

According to Dennis (2002), ethnicity affects both breastfeeding initiation and the duration of breastfeeding. The highest proportion of respondents was self-classified as of Canadian ancestry (24.5%). However, since no other ethnic group was self-identified in great numbers, it is inappropriate to compare breastfeeding practices across ethnic groups. Canada's official languages were reported to be "the first language learned at home, which is still understood", by most of the respondents (78.3% for English, 16.8% French). English and French ancestries were cited by 24.1% and 17.1%, respectively among respondents. The First Nations population was underrepresented in this sample. The findings are therefore limited in the generalizability to the population of Northern Ontario (Dodgson *et al.*, 2002).

4.1.6. Smoking Status

Similar to the studies cited by Dennis (2002), a mother's choice to breastfeed appears to be affected by smoking status. Of the women who smoked, 59% initiated breastfeeding, while 79% of the non-smokers initiated breastfeeding. Slightly more than 10% of the respondents smoked during the time period of breastfeeding. The results indicate that the greater the number of cigarettes a woman normally smokes daily, the less likely she is to initiate breastfeeding. This finding is especially true for mothers who smoked more than 24 cigarettes daily.

4.1.7. Maternal Employment

Less than half of the respondents indicated that they had participated in paid employment during the previous week. The majority of the women surveyed reported caring for their family as their primary activity, with most of the remainder indicating they both cared for their families and participated in paid employment.

Table 4.4. Main current activity of respondent

Main Activity	Frequency	Percent
Parental/maternity leave	336	9.9%
Working for pay or profit	297	8.7%
Caring for family	1397	41.1%
Caring for family and working for pay or profit	1274	37.4%
Going to school	77	2.3%
Recovering from illness/disability	5	0.1%
Looking for work	15	0.4%
Retired	1	0%
Total	3402	100.0%

Of those women working at a job or business the week prior to the Survey, 75% initiated breastfeeding, and 43% continued breastfeeding for their desired duration. Returning to school/work was a reason cited by women to discontinue breastfeeding. It is difficult to make any comparisons between those women whose primary activity is caring for the family to those who work at paid employment, since the Survey asks what the respondents' current activity is, not while breastfeeding, and the target child could now be six years of age.

4.2. Breastfeeding Initiation and Duration Rates

4.2.1. Breastfeeding Initiation Rates

Table 4.5 illustrates the frequency of responses within the total group for the dependent variable—"type of feeding 48 hours post birth". This variable is based on Question 22 of the NOPCHS, "how were you feeding him/her in the first 48 hours after his/her birth?" The results indicate that 74.4% were breastfeeding, while 22.3% were bottle-feeding, and 3.3% chose both breast and bottle.

Table 4.5. Frequency of breastfeeding at 48 hours after birth

Category	Frequency	Percent
Breastfeeding	2540	74.4%
Bottle feeding	762	22.3%
Both	111	3.3%
Total	3413	100.0%

The initiation rates for breastfeeding reported in the Survey were lower than those reported for Ontario. The initiation rate for the province is reported to be 80-84% (McKilligan, 1991, as cited in Bourgoin *et al.*, 1997; Sheehan, 2001), while the initiation rate was just under 75% in the NOPCHS sample.

4.2.2. Breastfeeding Duration Rates

Table 4.6 is intended to determine if the women surveyed continued to practice breastfeeding after leaving the hospital.

Table 4.6. Frequency of exclusive breastfeeding at various time intervals

Time Interval (in months)	Frequency
>0 to <1	500
>1 to <4	967
>4 to <6	632
>6 to <12	364
>12	38
Total	2501

The most common reason for breastfeeding was the "benefits for baby" (72.5%). "Convenience" was cited as a reason for breastfeeding by 21.9% of the sample, while "benefits for self" (11.7%), and "bonding" were reasons for breastfeeding for only 11.7% and 17.2%, respectively. "Successful previous experience" was the reason for breastfeeding for only 7.8% of the mothers surveyed. Support from family/friends did not seem to be a deciding factor in the decision to breastfeed with "support from partner" representing 4.8% of mothers' responses and "support from non-partner" representing only 0.2% of the sample. "Cost efficiency" was the reason to breastfeed for 12.3% of respondents, with the remainder of the reasons representing approximately 6% of respondents reasons to breastfeed: "desire to be natural" (2.7%), "wanting the experience" (1.3%), "pressured by others" (0.9%), "cultural/family tradition" (0.6%), and "other (0.6%).

The reasons for breastfeeding, as reported by the mothers in the NOPCHS were similar to those identified in the literature. As cited by Matthews *et al* (1998), reasons for breastfeeding were most commonly "infant-centered", with most of the women reporting they breastfed for the "benefits to baby".

4.2.3. What Problems Were Encountered During Breastfeeding?

Although only 23.4% of the sample indicated that they had problems with breastfeeding once at home, these women experienced a number of different problems.

Problems perceived by the mothers can be separated into two categories: those that originated from the child and those originating from the mother. "Baby fussing/crying" (3%), "baby had jaundice (1.1%), "baby dehydrated" (0.5%), "baby too sleepy" (1.3%), "thrush" (1.5%), "latching problems" (6.8%), and "weight loss in baby" (0.6%) were the problems affecting the child as reported by respondents. A greater number of respondents reported problems while breastfeeding that directly affected or originated from themselves than for their child. These problems included: "worried did not have enough milk" (5.8%), "sore nipples" (6.2%), "mastitis (breast infection)" (2.8%), "time constraints" (0.8%), and "emotional difficulty" (0.5%). The remaining 0.5% fit under the category of "other" problems with breastfeeding.

4.2.4. Reasons for No Longer Breastfeeding

Similar to the literature, the reasons cited for discontinuing breastfeeding are related to the mother (ELDEQ, 1998-2002; Bulk-Bunschoten *et al.*, 2001) (See Table 4.7.).

Table 4.7. Reasons reported for discontinuation of breastfeeding

Reason for Discontinuation of Breastfeeding	Percent of Respondents
Not enough milk	12.7%
Inconvenience/fatigue	11.3%
Difficulty with breastfeeding techniques	3.9%
Sore nipples/engorged breasts/mastitis	6.2%
Illness	3.5%
Planned to stop at this time	10.4%
Child weaned him/herself	13.9%
Advice of doctor	1.9%
Returned to work/school	13.9%
Advice of partner	0.8%
Formula feeding preferable	4.2%
Wanted to drink alcohol	0.2%
Lack of support	0.6%
Other	0.5%
Don't know/refused	0.3%

At one month postpartum, Bowden *et al.* (1999) stated that 87% of the women from Ontario in their study were breastfeeding. According to the NOPCHS, 76.8% of women breastfed for at least one month. Just less than 40% of the women represented by the NOPCHS were breastfeeding at four months, indicating that less women in this sample continue to breastfeed until the fourth month postpartum than the women surveyed in London, Ontario (INFACT, 1999), but around the Canadian average (Williams *et al.*, 1996; Williams *et al.*, 1996; Barber *et al.*, 1997, as cited by Dennis, 2002). The number of women breastfeeding in this sample of mothers from Northern Ontario at six months (15%) is much lower than reported in a

study of women from Sudbury (40%) by Bowden (1999). Only 1.5% of women in the NOPCHS were breastfeeding their child at 12 months.

Of the Survey respondents reported whether they reached their desired duration of breastfeeding, 60% were unsuccessful at meeting their goal. The failure to breastfeed as long as desired, and lower breastfeeding initiation and duration rates in the NOPCHS than previous Ontario studies, indicates the importance of determining whether the barriers to breastfeeding for women in Northern Ontario are the same as those reported in the literature.

4.3. Barriers to Breastfeeding, as Identified by the Survey

4.3.1. Health of Child

One of the barriers to breastfeeding identified in the literature is having a baby that is not healthy. Cahill and Wagner (2002) report that strategies for breastfeeding a healthy, term newborn, fall short with an infant who is premature or has another medical complication. Whether the health of the target child affected breastfeeding initiation and duration is not known with any certainty for this sample, since such a small number of women reported their child to be in poor or very poor health (less than 1%).

Table 4.8 Health of child as reported by mother

Category	Frequency	Percent
Very Poor	8	0.2%
Poor	21	0.6%
Satisfactory	150	4.4%
Good	647	19.0%
Very good	2586	75.8%
Total	3412	100.0%

4.3.2. Attitudinal and Intrapersonal Characteristics

4.3.2.1. Maternal Intentions

Although there is no way to know what the respondents' intended breastfeeding duration was, or when the decision was made, the data indicates that the majority did not breastfeed for as long as intended. Approximately twice as many mothers responded that their expectations of breastfeeding were accurate than those whose expectations were not the same as their breastfeeding experience.

4.3.2.2. Maternal Confidence

Most respondents were confident breastfeeding shortly after the birth of their child. Approximately 40% felt "very confident" in their ability, with less than 10% indicating that they were either "not very" or "not at all confident".

The respondents indicated that they were very comfortable with "positioning at the breast" (40.6%), "baby's latching" (38.8%), "recognizing baby's cues" (43.8%), and "recognizing the signs that the baby is feeding adequately" (39.8%). An even greater number (53.1%) of respondents were very comfortable in their ability to recognize the signs indicating that they should seek help during the breastfeeding period.

When asked how important they believed it was for a woman to have a special place to breastfeed or express milk in public places, most respondents felt it was "very important". Breastfeeding areas in malls received the most support, with 64.2% believing it very important to have a special place, followed by the workplace (55.9%) and restaurants (51.5%). Far fewer women indicated that they were comfortable breastfeeding in the locations previously listed.

While in malls, only 18.6% were "very comfortable" breastfeeding, 19.1% were "very uncomfortable", and the remainder fit in between the two. Similar results were observed with restaurants and workplaces. When at a restaurant, 16.7% reported to be "very comfortable" and 19.9% "very uncomfortable" breastfeeding. Many of the women in the Survey were not currently employed, but of those who were working, 7.4% were "very comfortable" breastfeeding while at work, 9.9% were "very uncomfortable".

4.4. Support Provided During Breastfeeding Initiation and Duration

4.4.1. Spouse and Family Support During Breastfeeding Initiation

The results of the NOPCHS supported the findings of ELDEQ (1998-2002); spousal and family support was reported to be the most helpful and important while making feeding decisions. Ninety-two percent of the respondents received support from their spouse/partner for their choice of feeding method. The spouses/partners were reported to be "very helpful" by 73.5% of the mothers. A similar number of women (92.4%) reported that their family/close friends supported their feeding decisions, 67.7% of whom stated their family/friends were "very helpful" in supporting this decision.

4.4.2. Professional Support During Breastfeeding Initiation

Almost all respondents had a family doctor (93.4%), with most of them (80%) receiving support for their decision of how to feed their child from their doctor. Less than two-thirds, however, felt that their doctor was either 'helpful' or 'very helpful' in supporting their chosen feeding method. Only 27% of the respondents received support from a lactation consultant for

their feeding method, but 19.2% of the total sample (71.1% of those with access to a lactation consultant) reported the lactation consultant to be "very helpful" in supporting the decision of how to feed the baby.

After experiencing problems breastfeeding once at home, 19.7% of the respondents reported seeking help. Most sought help from health professionals: mother's doctor/nurse practitioner /midwife/obstetrician" was the source of support for 7.9% of the respondents, public nurses helped 7.6% of the sample, and lactation consultants were used by 4.8%. Other sources of support included "baby's doctor" (1.2%), "the breastfeeding help line" (0.8%), and "family/friends (3.3%).

4.4.3. Health Services Offered to Pregnant and New Mothers

Although almost all women had access to many health service programs (Healthy Babies, Healthy Children, family resource centres, prenatal classes, etc.), few accessed the services of these programs. The majority of women felt that there were no obstacles to using the program and that they did not require the services. Eighty-five percent of women were either 'somewhat satisfied' or 'satisfied' with the services available to themselves and their child.

After experiencing problems breastfeeding once at home, 19.7% of the respondents reported seeking help. Health professionals were reported by the greatest number of women as a source of support, with mother's "doctor/nurse practitioner /midwife/obstetrician" being the source of support for 7.9% of the respondents, public nurses helping 7.6% of the sample, and lactation consultants being used by 4.8%. Other sources of support included "baby's doctor" (1.2%), "the breastfeeding help line" (0.8%), and "family/friends (3.3%).

Over 85% of respondents felt that they had a somewhat or very strong sense of belonging to their local community. When asked if they knew where to receive help in their community, only 4% disagreed. Prenatal classes were available to 92.9% of respondents, but only 43.2% reported attending the classes. The majority of women (80.2%) received prenatal care from their family doctor or an obstetrician, with over 85% receiving prenatal care within the first trimester. Table 4.9. indicates respondents' awareness of community resources during pregnancy, while Table 4.10. indicates whether the services were located close to home, and the frequency with which the respondents used the programs in the preceding year.

Table 4.9. Awareness of community resources during pregnancy

Community Program	Frequency of responses (%)
Public health nursing visit/telephone calls	70.6%
Healthy Babies/Healthy Children Program	51.1%
Well-baby drop ins at Health Unit	40.6%
Parent child information line	35.7%
Breastfeeding support drop-ins	48.7%
Breastfeeding mentorship program	26.2%
None	9.6%

Table 4.10. Availability and use of community resources

Resource	% With access close to home	% With access who used program in last year
Parenting and prenatal class	83%	19%
Parent support groups	57%	8%
Family resource centers	58%	12%
Health unit clinics (breastfeeding clinic, drop-ins)	76%	19%
Parent information line	100%	14%
Healthy Babies, Healthy Children	100%	19.4%

Table 4.11. details the services obtained from the Healthy Babies, Healthy Children program.

Table 4.11. Services obtained from the Healthy Babies, Healthy Children program

Service	Frequency	Percent
48 hour post discharge phone call from public health nurse	1434	42.0%
Home visit from a public health nurse after the birth of child	746	21.9%
Ongoing services from the Health Babies Healthy Children Program	457	13.4%
Other	82	2.4%
None	580	17.0%
All of the above	107	3.1%
Not stated	7	0.2%
Total	3413	100.0%

Over 85% of the respondents were either "somewhat" or "very satisfied" with the supports and services available to themselves and their child. Although satisfied with the programs available, most women do not access the health services available (as noted above). Over 75% reported that there were either "no problems" in participating in community programs or they "did not need" the services. Table 4.12. identifies the reported obstacles to participating in community programs.

Table 4.12. Obstacles to participating in community programs

Obstacle	Frequency	Percent
No Problems	2056	60.2%
Don't need it	531	15.6%
Don't know enough about it/need more information	267	7.8%
Don't like the program	2	0.1%
Cost	16	0.5%
Inconvenient Location	93	2.7%
Transportation	83	2.4%
Hours of Operation	73	2.1%
Language	7	0.2%
Lack of child care	20	0.6%
Job	64	1.9%
Child's health/disability	3	0.1%
Other	75	2.2%
No time	25	0.7%
Not Applicable	98	2.9%
Total	3413	100.0%

4.5. Predicting Breastfeeding Initiation and Duration

Regression analyses were used to determine which measures could best predict whether or not a mother initiated breastfeeding in the first 48 hours post delivery; and which measures could best predict how long a mother breastfed exclusively.

Prior to creating the regression analyses, all variables that might be considered as predictors (in either equation) were organized and measured for pair-wise correlation using the Pearson product-moment correlation procedure. To avoid multi-colinearity in the regression analyses, a single predictor was chosen from pairs of variables that demonstrated $r > 0.7$ ($p < 0.05$). The variables representing the pairs of variables along with those variables not correlated to other variables were included as independent variables in each regression equation.

First regression analysis

1.) The determinant of whether or not a mother chose to breastfeed was evaluated using the dependent variable—initiated breastfeeding (scored as 1=yes, 2=no, 3=both).

Breastfeeding initiation = 1.863 + 0.0087 (bonding with child) + 0.0013 (comfortable breastfeeding in a restaurant) – 0.0005 (comfortable breastfeeding in workplace) – 0.02 (personal health) – 0.0065 (partner's education) + 0.0065 (partner's employment status)
Model parameters $p < 0.01$, $r = 0.747$, $r^2 = 0.556$ [Equation 1]

This estimate indicates which variables predicted breastfeeding initiation. According to the regression analysis, the following observations can be made:

- The reason for breastfeeding most likely to predict breastfeeding initiation is "bonding with child"
- A mother's comfort breastfeeding in public (specifically in a restaurant or workplace) predicts breastfeeding initiation
- The mother's health affected her decision to initiate breastfeeding
- The partner's level of education and income predicted whether the mothers in the Survey initiated breastfeeding, interestingly to a higher degree than her own education or employment status

Second regression analysis

2.) The determinant of how long a mother breastfed exclusively was evaluated using the dependent variable— breastfeeding exclusively duration (scored as number of months).

Breastfeeding duration = 2.406 + 1.322 (not enough milk) – 1.222 (child weaned him/herself) – 0.013 (comfortable breastfeeding in malls) + 0.360 (confidence breastfeeding at discharge) + 0.0217 (used Healthy Babies, Healthy Children program) + 0.0081 (number of cigarettes mother smokes/day) + 0.886 (inconvenience/fatigue) – 0.976 (planned to stop at this time) + 0.0080 (worried did not have enough milk) – 0.0050 (attended prenatal classes) + 0.0034 (comfortable breastfeeding in workplace) + 0.297 (aware of breastfeeding drop-ins) – 0.412 (cost efficacy) – 0.338 (support from lactation consultant)
Model parameters $p < 0.01$, $r = 0.468$, $r^2 = 0.215$ [Equation 2]

This estimate indicates which variables predicted breastfeeding duration (for those breastfeeding exclusively). According to the regression analysis, the following observations can be made:

- "Not having enough milk", and "child weaned him/herself", "planned to stop at this time", and "inconvenience/fatigue" are the reasons for discontinuing breastfeeding that are most likely to predict breastfeeding duration
- Comfort breastfeeding in a mall and in the workplace predict breastfeeding duration
- Breastfeeding duration is predicted by attending prenatal classes, using the HBHC program, being aware of drop-ins, and receiving support from a lactation consultant
- The number of cigarettes that a mother smoked per day affected the duration that she breastfed
- Feeling confident at the time of hospital discharge predicts breastfeeding duration
- Reporting "cost efficacy" as a reason for breastfeeding predicts breastfeeding duration
- When asked what problems were encountered once at home, "worried about having enough milk" was most likely to predict duration of exclusive breastfeeding

It is important to note that although the signs (positive and negative) used in the regression analysis do indicate positive or negative correlation, that they must be considered in the context of the entire regression equation.

In order to plan health services and programs for new mothers it is important to know the variables predicting both breastfeeding initiation and duration. It has been suggested that women breastfeed for at least six months, yet in the present study less than 50% breastfed for exclusively for greater than four months (as shown in Table 4.7) [$x^2 = 934.53$, $p < 0.05 = 9.49$].

5.0. Interpretation of Findings

According to the results of the Survey and the corresponding linear multiple regression, there are variables that predict whether a woman living in Northern Ontario will initiate breastfeeding and predict whether she will continue to breastfeed exclusively for the recommended six month minimum.

The results from the regression analysis suggested that a mother's choice to breastfeed was based on whether she wished to increase her bonding with her child; whether she was comfortable breastfeeding in public places; whether she was in good health; and the level of her partner's education.

Likewise, the regression output the length of time a mother breastfed was determined by a mother reporting an inadequate supply of milk; the child weaning him/herself; whether a mother felt comfortable breastfeeding in the mall; the mother's confidence with breastfeeding at hospital discharge; whether the mother used of the Healthy Babies, Healthy Children program; the number of cigarettes the mother smoked; reported fatigue or inconvenience of breastfeeding by the mother; a plan to stop at the time when child was weaned; whether the mother worried about insufficient milk supply; the mother's attendance at prenatal classes; comfort breastfeeding at the workplace; awareness of breastfeeding drop-ins; the choice to breastfeed for cost efficacy; and the mother having the support of a lactation consultant.

Breastfeeding initiation is related to the level of support a mother receives and from whom she receives the support. Like the results of ELDEQ (1998-2002), the mothers in the Survey relied more on the support of her loved ones (family, friends) when making the decision to breastfeed than in helping with any problems that may arise. Although she is likely to seek

support from her doctor, she is less likely to rate them as being as helpful as other health care professionals (lactation consultants, nurse practitioners, midwives). As indicated by Gill (2001) and Taveras (2003), health professionals play a very important role in breastfeeding initiation and subsequent duration.

In the weeks following childbirth, the respondents reported feeling comfortable in their ability to breastfeed and to recognize their baby's needs. Most respondents reported that they did not have any problems at home. However, of those mothers who reported problems breastfeeding, their problems included not enough milk, cracked nipples, mastitis, time constraints, latching problems, and emotional difficulties. Most women made the decision to breastfeed because of the perceived benefits from breastfeeding to their infant. The reasons that mothers reported stopping breastfeeding were related to problems/issues that they experienced themselves. The reasons for discontinuing breastfeeding were often based on common myths, and there was no definitive reason for stopping.

Most women felt that there should be breastfeeding areas in malls, restaurants and workplaces, but if these places did exist, over three-quarters of respondents would not feel comfortable using the space.

In order to increase the breastfeeding initiation and duration rates in Northern Ontario, it is necessary to provide services, support, and information for new and expecting mothers, enabling them to overcome any barriers. As outlined above, the data collected during the NOPCHS identifies barriers to breastfeeding, which in turn relate to a mother's feeding choices and behaviour.

Low socio-economic status is a barrier to breastfeeding, according to results of the NOPCHS. The lower a family's income, the less likely that that mother is to initiate breastfeeding. It is important to provide programs for these mothers and children by finding out how their income affects their decision to feed. As outlined by Williams *et al.*, 1999, cost often affects the decision to breastfeed. Women may choose to breastfeed because of the greater expense of formula. Since individuals with a low income are less likely to initiate breastfeeding and less likely to have the discretionary money to buy formula (Table 2.3), it may be advantageous to promote the cost savings of breastfeeding. It is important to make the information provided relevant to women of lower socio-economic status, by promoting breastfeeding in a way that is applicable to their lives and is in a format that is accessible to them.

As shown in the results of the Survey, as a woman's age increases, so too does the likelihood of her initiating breastfeeding. The same holds true of level of education achieved, the more educated a woman is, the more likely she is to breastfeed. It would be helpful, therefore, to begin information sessions on breastfeeding at an early age. By promoting the benefits of breastfeeding at an age appropriate level to students in public and secondary schools, information would be provided to those females who become pregnant during their school-aged years and to those who may not continue their education and would help to dispel breastfeeding myths for male and female students. Since less than two-thirds breastfed for their intended duration, it is important to study why they felt the need to discontinue breastfeeding and what supports/services could be provided to help women reach their desired duration.

The myths outlined in the Appendix were reasons for breastfeeding cessation. Women reported discontinuing breastfeeding because they "did not have enough milk", they "wanted to drink alcohol", and the "baby weaned him/herself", all reasons that Health Canada (1990) cited as common breastfeeding misconceptions in the general population. It is therefore important to provide new and expecting mothers, along with the general population factual information about these and other myths, to dispel inaccurate information, and to educate mothers on the benefits of breastfeeding.

A few of the reasons for no longer breastfeeding reported by respondents could be helped with the support of a nurse, lactation consultant, or peer educator. "Inconvenience/fatigue", "difficulty with breastfeeding techniques", "sore nipples/engorged breasts/mastitis", and "lack of support" are some of the areas that these health educators are trained and by providing support to the mothers, these professionals and helpers can help make the breastfeeding experience less of a burden and more of a comfortable experience to mother and child.

Ninety percent of respondents indicated that they were in a relationship. The respondents also reported that their partners were very important in supporting their chosen feeding method. Since spouse/partner, in addition to other family and friends were viewed to be such integral support systems in the decision and success of breastfeeding by those in the Survey, it is important to include these people in information sessions, programs, and prenatal classes. Even though a small number of women reported that their partner advised them to discontinue breastfeeding (less than 1%), this number demonstrates the need for a woman's support system to be provided with information and support during the decision to breastfeed and throughout the duration of feeding.

Lactation consultants and nurses were reported to be 'very helpful' in supporting a mother's choice of feeding method. Lactation consultants were ranked to be the most helpful of all professionals providing supports, but unfortunately not many women had access to a consultant. It is important to try to increase the number of lactation consultants available to new mothers, so that more women have the expertise and support of a lactation consultant. Many women reported not having a call or home visit from a nurse during the 48 hours after being discharged from the hospital. Since this time period is known to be very important in the continuation of breastfeeding, the number of women receiving these services should be increased.

Although doctors were seen as very important in supporting the women make the decision of how to feed their infant, they were not found to be as helpful as spouse/partner, family or close friends. It is important that physicians be educated on the benefits to breastfeeding, as well as the issues surrounding breastfeeding so that they are comfortable in supporting a woman choosing to breastfeed and knowledgeable in the services available to the mother, should she require them. The need for breastfeeding information sessions for physicians was exemplified by Walton and Edwards (2002), whose study indicated that most physicians were not comfortable in managing breastfeeding issues. It is unknown for what reason women in the NOPCHS were advised by their doctor to discontinue breastfeeding, but would be interesting as a future research project.

Returning to work/school was a reason not to continue breastfeeding as demonstrated by the findings of the Survey. Approximately half of the respondents were either on maternity/parental leave or reported their primary current activity to be caring for their family.

Of the women who were currently working at paid employment, most reported their employer to be supportive if they had to leave for a family reason and about half reported that their employer was supportive in providing breastfeeding arrangements at work. When asked whether they were comfortable breastfeeding at work, slightly more women reported that they were 'very uncomfortable' than 'very comfortable'.

Most respondents felt it important that a woman have a special place to breastfeed or express milk in public locations such as restaurants, malls, and the workplace. Most of the women, however, did not feel comfortable breastfeeding in public. It is important that the reasons for this discomfort be researched so that solutions be developed, enabling women to feel comfortable breastfeeding their child while in public.

6.0. Recommendations for Health Planners

The results indicated that only 16% of the respondents continued to breastfeed at six months. This finding suggests that current public health breastfeeding programs are not sufficient to overcome the barriers to breastfeeding.

1. Programs must be relevant to mothers. Relevance of programs for new mothers must be explained to new mothers, as well as the general public. According to the results of the NOPCHS, mothers have access to breastfeeding programs and are aware of available services, but most are not using the services. It is important to identify why the mothers are not using the available services and use this information to increase the numbers of women accessing breastfeeding programs.
2. Most mothers report accessing help from a health professional when a problem is encountered. It is therefore necessary to have professionals trained in providing support to mothers choosing to breastfeed. It is also recommended that professionals not only have a presence when problems arise, but take a proactive role in providing breastfeeding support and information.
3. Most mothers used programs where a health service provider contacted her (e.g. Healthy Babies, Healthy Children where a nurse contacts new mothers within 48 hours of returning home), rather than where she had to seek out the service. It is recommended that services be 'user-friendly' and that coordinating staff contact the mother to try and include her in programming, rather than hoping that she will call and enroll.
4. Mothers supported having places to breastfeed in malls, restaurants, and workplaces, but reported not feeling comfortable doing so. It is important to increase the number of

"breastfeeding-friendly" places and to increase public awareness so that society is more accepting and supportive of mothers making the choice to breastfeed. Providing mothers with information and ideas for breastfeeding in public, as well as increasing attendance in breastfeeding support groups (where mothers have the opportunity to see others breastfeed) may also help increase the number of women feeling comfortable when breastfeeding in public.

7.0. Appendices

International Code of Marketing Breast Milk Substitutes

No advertising of these products to the public.

No free samples to mothers.

No promotion of products in health care facilities.

No company mothercraft nurses to advise mothers.

No gifts or personal samples to heath workers.

No words or pictures idealizing artificial feeding, including pictures of infants on the labels of the products.

Information to health workers should be scientific and factual.

All information in artificial infant feeding, including the labels, should explain the benefits of breastfeeding, and the costs and hazards associated with artificial feeding.

Unsuitable products, such as sweetened condensed milk, should not be promoted for babies.

All products should be of a high quality and take account of the climatic and storage conditions of the country where they are used.

(WHO/UNICEF, 1981)

Ten Step Baby-Friendly Hospital Initiative

Have a written breastfeeding policy that is routinely communicated to all health care staff
Train all health care staff in skills necessary to implement this policy
Inform all pregnant women about the beliefs and management of breastfeeding.
Help mothers initiate breastfeeding within half an hour of birth.
Show mothers how to breastfeed and how to maintain lactation even if they should be separated from their infant.
Give newborn infants no food or drink other than breast milk, unless medically indicated.
Practice rooming-in; allow mothers and infants to remain together 24 hours a day.
Encourage breastfeeding on demand.
Give no artificial teats, pacifiers, dummies, or soothers to breastfeeding infants.
Foster the establishment of breastfeeding support groups and refer mothers to them on discharge from the hospital or clinic. (Humenick & Gwayi-Chore, 2001)

General Characteristics shared by women who breastfeed in developed countries
(Dennis, 2002)

Characteristic	Reference
white race	Jacobson, Jacobson & Frye, 1997; Kum-Nji, Mangrem, Wells, White, & Herrod, 1999;
higher socioeconomic status	Bourgoin *et al.*, 1997; Matthews *et al.*, 1998; Ryan, 1997
well educated	Barber *et al.*, 1997; Evers, Doran, & Schellenberg, 1998; Scott, Aitkin, Binns, &
married	Bick *et al.*, 1998; Evers *et al.*, 1998; Pande, Unwin, & Haheim, 1997
older	Evers *et al.*, 1998; Hammer, Bryson, & Agras, 1999; Pande *et al.*, 1997
nonsmoker	Clements *et al.*, 1997; Nolan & Goel, 1995
not employed outside the home	Bick *et al.*, 1998; Gielen *et al.*, 1992; Kearney & Cronenwett, 1991
increased parity	Hammer *et al.*, 1999; Pande *et al.*, 1997; Ryan, 1997
attended prenatal classes	Clements *et al.*, 1997; Evers *et al.*, 1998; Piper & Parks, 1996
mother of a healthy full-term infant	Lawson & Tulloch, 1995; Pande *et al.*, 1997; Ryan, 1997
friends or family with breastfeeding experience	Libbus *et al.*, 1997; Wiemann, DuBois, & Berenson, 1998
successful previous breastfeeding experience	Barber *et al.*, 1997; Bourgoin *et al.*, 1997; Humenick, Hill, & Spiegelberg, 1998

Breastfeeding Myths

Numerous prevailing myths regarding breastfeeding negatively impact the number of women who choose to breastfeed as well as the length of breastfeeding duration. In order for women to make an informed infant feeding decision, it is necessary to dispel some of these myths. The following are some of the most common myths that impede healthy breastfeeding practices, and also decrease rates of breastfeeding initiation and duration.

Myth #1: Many women do not produce enough milk.

Most women produce more than enough milk. Physiologic studies reveal that only 1% to 5% of women actually have problems with insufficient breast milk production (Inch and Renfrew, 1995 as cited in Dennis, 2001). Breast milk is produced on the principles of supply and demand; amounts produced will vary according to the infant's needs (Hornell *et al.*, 2001). The problem is often that the baby is not receiving the milk that the mother has, either due to latching problems or improper feeding practices rather than the mother not actually producing enough milk (Newman, 1998). For this reason, it is imperative that the mother is shown how to latch the baby correctly to the breast within the first hour after birth, as delayed breastfeeding initiation may result in disinterest and latching difficulties for the infant (Newman, 1998, Hartmann *et al.*, 2003).

Myth #2: Women need to drink milk to produce milk.

The distribution of milk coupons to mothers who breastfeed may convey the misconception that a mother must drink milk to produce quality breast milk. This myth can be

damaging as some mothers discontinue breastfeeding if they cannot afford to drink milk on a regular basis (HC, 2002). Though it is highly recommended that breastfeeding mothers drink milk, it is not imperative that a mother drinks milk to produce quality breast milk.

Myth #3: The baby should breastfeed for a set time period.

Another common mistake made by mothers when breastfeeding is limiting the amount of time the baby feeds on each breast, which is termed 'time limiting'. Time limiting not only limits a woman's milk supply, it also minimizes a baby's caloric intake. The foremilk expressed during the first few minutes of feeding is low in fat and calories. It is not until during the latter part of the feeding that the milk increases in lipid content. The baby may not get the lipid rich milk that is essential for growth if the baby is time limited on each breast (Anderson, 1999). A distinction must also be made between time at the breast and time actually breastfeeding. A baby may be at the breast for twenty minutes and only drink for five minutes due to latching problems. A mother must watch to see if baby is swallowing to ensure that he is feeding effectively while at the breast (Anderson, 1999 and Hartmann *et al.*, 2003).

Myth #4: Babies should be breastfed every four hours

There is no feeding schedule that is right for every baby. As a result, mothers should breastfeed on demand (when the child seems hungry) rather than limit feedings to pre-established intervals (Newman, 1998). The frequency of feedings may vary based on the storage capacity of a mother's breasts as well as growth spurts of the baby. A mother with a large breast capacity may only have to express milk four times at each breast in one day, while a woman with

a small capacity may have to express milk eight times a day at each breast (Hartmann *et al.*, 2003).

Myth #5: Women on medication should not breastfeed.

Women often feel the need to discontinue breastfeeding unnecessarily when on medication. It is common for mothers to need pharmacologic treatment while breastfeeding. Most prescription and over-the-counter medications do not contraindicate breastfeeding (Anderson, 1999). Medications that are contraindicated for breastfeeding include radioactive isotopes, antimetabolites, cancer chemotherapy agents, and illicit drugs such as cocaine (Kerr *et al.*, 2001). Thus, breastfeeding is rarely contraindicated, unless a mother is undergoing cancer treatment or experiencing a drug addiction (Health Canada, 2002).

Myth#6: Women suffering illness/infection should not breastfeed.

There are very few instances requiring mothers to discontinue breastfeeding due to infection (Health Canada, 2003). Babies receive antibodies from breastfeeding, which offers increased protection from illness when the mother is ill. Furthermore, mothers unknowingly transmit infections through their breast milk days before showing any symptoms. Therefore, continued breastfeeding is a baby's best defense against illness (Newman, 1998). Infectious diseases that do contraindicate breastfeeding include human immunodeficiency virus (HIV), human T-cell lymphotrophic virus, and cytomegalovirus (CMV), active tuberculosis (TB), and galactosemia (Kerr *et al.*, 2001).

Myth #7: Women who smoke should not breastfeed.

Mothers should not smoke, however, it is much more beneficial to the child for mothers to smoke and breastfeed than to smoke and formula feed (HC, 2002). Breastfeeding decreases the negative effects of cigarette smoke in a baby's lungs, making breastfeeding of increased importance when a mother smokes (Newman, 1998).

Myth #8: Women who drink alcohol should not breastfeed.

Moderate alcohol consumption while breastfeeding is not detrimental to a child's health. As with medication, there is a minute concentration of alcohol in breast milk. Breastfeeding remains the best choice for a child's health, despite moderate alcohol consumption (Newman, 1998).

Choosing not to breastfeed is often more detrimental to a baby's health than smoking, taking most medications, or drinking moderately while breastfeeding. Health Canada states "Breastfeeding is rarely contraindicated. Neither smoking nor environmental contaminants are necessarily contraindications to breastfeeding. Moderate, infrequent alcohol ingestion, the use of most prescription and over-the-counter drugs and many maternal infections do not preclude breastfeeding" (Health Canada, 2002). It is also important that mothers are trained in correct feeding techniques to ensure that their babies are receiving the full benefits associated with breastfeeding.

Bivariate correlations between questions within a proposed predictor set

Breastfeeding Initiation:

Predictor set	-Did you receive support for the way you chose to feed him/her from the following people? Your baby's doctor (2a.3ia) -Was your baby's doctor... (2a.3ib) - Did you receive support for the way you chose to feed him/her from the following people? Spouse/partner (2a.3viia) - Was your spouse / partner... (2a.3viib)
Range of correlation	R=1.000, $p < 0.0001$
Therefore, question 2a.3ia will represent 2a.3ib and 2a.3viia will represent 2a.3viib	

Exclusive Breastfeeding Duration:

Predictor set	- We are interested in the reasons that women choose to breastfeed. Please tell us why you chose to breastfeed (2a.4): • Benefits for self (2a.4b) • Convenience (2a.4c) • Bonding (2a.4d) • Successful previous experience (2a.4e) • Support from partner (2a.4f) • Support from non-partner (2a.4g) • Cost-efficacy (2a.4h) • Desire to be 'natural' (2a.4i) • Wanting the experience (2a.4j) • Pressured by others (2a.4k) • Cultural/Family tradition (2a.4l) • Other (2a.4m)
Range of correlation	R=1.000, $p < 0.0001$
Therefore, question 2a.4b will represent the predictor set	

Part 3:

Predictor set	-Upon hospital discharge (or if not born in hospital, shortly after the birth of the baby), how would you describe your level of comfort with (2a.5i): • Positioning of baby at the breast (2a.5ia) • Baby's latching (2a.5ib) • Recognizing baby's cues (2a.5ic) • Recognizing signs if baby's adequately fed (2a.5id) • How confident you felt about breastfeeding when you were discharged from hospital (or if not born in hospital, shortly after the birth of him/her)? (2a.6i) -How confident would you feel in recognizing signs indicating that you should seek help? (breastfeeding) (2a.6ii)
Range of correlation	R= 0.841→1.000, $p < 0.0001$
Therefore, question 2a.5ia will represent the predictor set	

Part 4:

Predictor set	-Did you receive support for the way you chose to feed him/her from Family/close friends? (2a.3viiia) - Was your family / close friends…(2a.3viib) -Did you receive support for the way you chose to feed him/her from lactation consultant? (2a.3xa) - Was your lactation consultant…(2a.3xb)
Range of correlation	R= 1.000, $p < 0.0001$
Therefore, question 2a.3viiia will represent will represent 2a.3viiib and 2a.3xa will represent 2a.3xb	

Part 5:

Predictor set	-What were the problem(s) with breastfeeding? (2b.3) • Baby fussing/crying (2b.3a) • Baby had jaundice (2b.3b) • Baby dehydrated(2b.3c) • Baby too sleepy (2b.3d) • Worried you did not have enough milk (2b.3e) • Sore nipples (2b.3f) • Mastitis (2b.3g) • Thrush (2b.3h) • Latching problems (2b.3i) • Time constraints (2b.3j) • Emotional difficulty (2b.3k) • Weight loss in baby (2b.3l) • Other (2b.3m)
Range of correlation	R= 1.000, $p < 0.0001$
Therefore, question 2b.3a will represent the predictor set	

Part 6:

Predictor set	-Did you seek help from anyone? (2b.4) -Who did you seek help with breastfeeding from? • Breastfeeding help line • Family member/friend • Doctor/midwife/nurse practitioner/obstetrician • Baby's doctor • Public health nurse • Lactation consultant
Range of correlation	R= 0.897→1.000, $p < 0.0001$
Therefore, question 2b.4 will represent the predictor set	

Part 7:

Predictor set	-Do you still breastfeed him/her now? (2b.5) -What is the main reason you stopped breastfeeding: • Not enough milk • Inconvenience/fatigue • Difficulty with breastfeeding techniques • Sore nipples/engorged breasts/mastitis • Illness • Planned to stop at this time • Child weaned him/herself • Advice of doctor • Returned to work/school • Advice of partner • Formula feeding preferred • Wanted to drink alcohol • Lack of support • Other • Don't know/refused -Were you able to continue breastfeeding for the length of time you intended? (2b.9)
Range of correlation	R= 1.000, $p < 0.0001$
Therefore, question 2b.5 will represent the predictor set	

Part 8:

Predictor set	-How comfortable do or did you feel breastfeeding in the following situations: (2b.10.i) • Malls • Restaurants • In the presence of family/friends -How important is it for mothers who breast feed or express milk to have a special place in: (2b.11.i) • Malls • Restaurants • The workplace
Range of correlation	R= 0.703→1.000, $p < 0.0001$
Therefore, question 2b.10.i will represent the predictor set	

Part 9:

Predictor set	-Last week, did you work at a job or a business? Please include part-time jobs, seasonal work, contract work, self-employment, baby-sitting and any other paid work, regardless of the number of hours worked (7.9) -How flexible is your workplace in terms of: • Being able to leave early for a family reason (7.8i) • Breastfeeding arrangements at work (7.8ii)
Range of correlation	R= 0.994→1.000, $p < 0.0001$
Therefore, question 7.9 will represent the predictor set	

Part 10:

Predictor set	-What was the last year your partner completed at school, college or university? (7.14) -Last week, did your partner work at a job or a business? (7.15) -Which of the following main activity/activities does your partner do? (7.16)
Range of correlation	R= 0.997→0.999, $p < 0.0001$
Therefore, question 7.14 will represent the predictor set	

Part 11:

Predictor set	-How satisfied are you with the help that you receive from the supports and services available to you and your child? (6.10) -I know where to go for help in my community if I need it (6.11iii)
Range of correlation	R= 0.969, $p < 0.0001$
Therefore, question 6.10 will represent the predictor set	

Part 12:

Predictor set	-Are Parenting courses Prenatal classes available close to where you live? -Are Parent support groups available close to your home -Is there Family resource center available close to your home? -Are Health unit clinics for child services such as: Breastfeeding clinics, Well-Baby/pre-school clinic available close to your home?
Range of correlation	$R = 0.850 \rightarrow 0.985$, $p < 0.0001$
Therefore, "Are Parenting courses Prenatal classes available close to where you live?" will represent the predictor set	

8.0. References

Aikin, S.C. (1999). Factors influencing African American mothers to breastfeed their infants. *Journal of Multicultural Nursing & Health*, 5(2), 28-32.

Bailey, C, & Pain, R. (2001). Geographies of infant feeding and access to primary health-care. *Health and Social Care Community*, 9(5), 309-317.

Ball, T.M.& Wright, A. L. (1999). Health care costs of formula-feeding in the first year of life. *Pediatrics*, 103(4), 870-877.

Barber, C.M., Abernathy, T., Steinmetz, B. & Charlebois, J. (1997). Using a breastfeeding prevalence survey to identify a population for targeted programs. *Canadian Journal of Public Health*, 88(4), 242-246.

Beaudry, M. (n.d.). The Baby-Friendly Hospital Initiative in 1995: achievements and challenges. Speaker from the Child Health 2000 Presentations. Retrieved September, 5, 2003, from http://edie.cprost.sfu.ca/gcnet/ch2000_2/pn_beaud.html

Birth Issues. (1999). Canada's First Baby-Friendly Hospital. Retrieved September 5, 2003 from http://www.freenet.edmonton.ab.ca/asac/BI_fall99/hospital.html

Bourgoin, G.L., Lahaie, N.R., Rheaume, B.A., Berger, M.G., Dovigi, C.V., Picard LM, & Sahai V.F. (1997) Factors influencing the duration of breastfeeding in the Sudbury region. *Canadian Journal of Public Health*, 88(4), 238-241.

Bowden, J., Resendes, I., & Coleman, B.L. (2001). Breastfeeding duration in Elgin-St. Thomas 1999. St. Thomas Health Unit and St. Thomas-Elgin General Hospital. Retrieved September 12, 2003 from http://elginhealth.on.ca/upload/download.asp

Breastfeeding Committee for Canada. (2002). Affordable health care begins with breastfeeding support and the use of human milk. The National Authority for the WHO/UNICEF Baby-Friendly Initiative in Canada. Retrieved September 1, 2003 from http://www.breastfeeding canada.com/webdoc47.html

Brown, C.A., Poag, S., & Kasprzycki, C. (2001). Exploring large employers' and small employers' knowledge, attitudes, and practices on breastfeeding support in the workplace. *Journal of Human Lactation*, 17(1), 39-46.

Brownell, K., Hutton, L., Hartman, J. & Darbow, S. (2002). Barriers to breastfeeding among African American adolescent mothers. *Clinical Pediatrics*, 41(9), 669-674.

Bulk-Bunschoten, A.M., Bodegom, S.V., Reerink, J.D., Pasker de Jong, P.C., & Groot, C.J. (2001) Reluctance to continue breastfeeding in the Netherlands. *Acta Paediatrica*, 90, 1047-1053.

Cahill, J.B. & Wagner, C.L. Challenges in breastfeeding: maternal considerations. *Contemporary Pediatrics*, 19(5), 94-107.

Christensen, D. (2002). Breastfeeding has protective bonus. *Science News*, 162(6), 93.

Cohen, R., Lange, L., & Slusser, W. (2002). A Description of a male-focused breastfeeding promotion corporate lactation program. *Journal of Human Lactation*, 18(1), 61-65.

Cropley, L. & Herwehe, J.C. (2002). Evaluation of institutional support for breastfeeding among low-income women in the metropolitan New Orleans area. *Journal of the American Dietetic Association*, 102(1), 94-96.

Denman-Vitale, S., & Krantz Murillo, E. (1999). Effective promotion of breastfeeding among Latin American women newly immigrated to the United States. *Holistic Nursing Practice*, 13(4), 51-60.

Dennis, C.L. (2002). Breastfeeding initiation and duration: a 1990-2000 literature review. *Journal of Obstetric, Gynecologic and Neonatal Nursing*, 31(1), 12-32.

Dennis, C.L., Hodnett, E., Gallop, R., & Chalmers, B. (2002). The effect of peer support on breast-feeding duration among primiparous women: a randomized controlled trial. *Canadian Medical Association Journal*, 166(1), 21-28.

Dermer, A. (2001). A well kept secret: breastfeeding's benefits to mothers. *New Beginnings*, 18(4), 124-127.

Dobson, B. & Murtaugh, M.A. (2001). Position of the American Dietetic Association: Breaking the barriers to breastfeeding. *Journal of the American Dietetic Association*, 101(10), 1213-1220.

Dodgson, J.E., Duckett, L., Garwick, A., & Graham, B.L. (2002) An ecological perspective of breastfeeding in an Indigenous community. *Journal of Nursing Scholarship*, 34(3), 235-247.

Dubois, L., & Girard, M. (2003). Social determinants of initiation, duration and exclusivity of breastfeeding at the population level: The results of the Longitudinal Study of Child Development in Quebec. *Canadian Journal of Public Health*, 94(4), 300-305.

Dunlop, M. (1995). Few Canadian hospitals qualify for "Baby Friendly" designation by promoting breast-feeding: survey. *Canadian Medical Association Journal*, 152(1), 87-89.

Dzakpasu, S., & Trouton, K. (1998). Breastfeeding. Toronto: Canadian Perinatal Surveillance System. Retrieved on October 3, 2003 from http://www.hc-sc.gc.ca/pphb-dgspsp/rhs-ssg/factshts/brstfd_e.html

Essig, M.G. (2002). Breastfeeding lowers a child's risk of developing type 2 diabetes. *Women's Health Weekly*, 14.

Evers, S., Doran, L., & Schellenberg, K. (1998) Influences on breastfeeding rates in low income communities in Ontario. *Canadian Journal of Public Health*, 89, 203-207.

Fieldhouse, P. (1984). A revival in breastfeeding. *Canadian Journal of Public Health*, (75), 128-132.

Food and Nutrition Services, United States Department of Agriculture. (2003). About WIC. Retrieved on October 17, 2004 from http://www.fns.usda.gov/wic/aboutwic/default.htm

Furman, L., Taylor, G., Minich, N. & Hack, M. (2003). The effect of maternal milk on neonatal morbidity of very-low birth-weight infants. *Archives of Pediatric & Adolescent Medicine*, 157(1), 66-72.

Gagnon, A.J., Dougherty, J., Jimenez, V. & Leduc, N. (2002). Randomized trial of postpartum care after hospital discharge. *Pediatrics*, 109(6), 1074-1081.

Gartner, L.M., Black, L.S., Eaton, A. P., Lawrence, R.A. (1997). Breastfeeding and the use of human milk. *Pediatrics*, 100(6), 1035-1039.

Gill, S. (2001). The little things: perceptions of breastfeeding support. *Journal of Obstetrics, Gynecologic, and Neonatal Nursing*, 30(4), 401-409.

Gracey, M. (2000). Infant feeding and weaning practices in an urbanizing tradtional, Hunter-Gatherer society. *Pediatrics*, 106(5), 1276-1277.

Guttman, N. & Zimmerman, D.R. (2000). Low-income mothers' views on breastfeeding. *Social Science & Medicine*, 50, 1457-1473.

Hanson, L.A. (1998). Breastfeeding provides passive and likely long-lasting active immunity. *Annals of Allergy, Asthma and Immunology*, 81(6), 523-533.

Head, G., Brownell, K., Hutton, L., Hartman, J., & Dabrow, S. (2002) Barriers to breastfeeding among African American adolescent mothers. *Clinical Pediatrics*, 41(9), 669-674.

Health Canada. (1997). A multicultural perspective of breastfeeding in Canada. Retrived November 3, 2002 from http://www.hc-sc.gc.ca/dca-dea/publications/pdf/multicultural_bf_e.pdf

Health Canada. (1998). 10 great reasons to breastfeed. Retrieved December 10, 2002 from http://www.hc-sc.gc.ca/dca-dea/publications/pdf/reasons_to_bf_e.pdf

Health Canada. (1990). Nutrition for Healthy Term Infants. Retrieved on November 11, 2002 from http://www.hc-sc.gc.ca/hppb/childhood-youth/cyfh/homepage/nutrition

Hogan, S.E. (2001) Overcoming barriers to breastfeeding: suggested breastfeeding promotion programs for communities in eastern Nova Scotia. *Canadian Journal of Public Health*, 92(2), 105-108.

Humenick, S.S. & Gwayi-Chore, M. O. (2001). Leader or left behind: National and international policies related to breastfeeding. *Journal of Obstetrics, Gynecologic, and Neonatal Nursing*, 30(5), 529-540.

Hurley, W.L. (2002). Human milk and lactation. Retrieved on December 12, 2003 from http://classes.aces.uiuc.edu/AnSci308/HumanLact.html

Ineichen, B., Pierce, M., & Lawrenson, R. (1997). Teenage mothers as breastfeeders: attitudes

and behavior. *Journal of Adolescence*, 20, 505-509.

Kannan, S., Carruth, B.R., & Skinner, J. (1999) Cultural influences on infant feeding beliefs of mothers. *Journal of the American Dietetics Association*, 99(1), 88-90.

Kazal, L.A. (2002). Prevention of iron deficiency in infants and toddlers. *American Family Physician*, 66(7), 1217-1224.

Kerr, B.A. (2001) Breastfeeding in the preterm infant. Retrieved August 3, 2003 from http://www.dcmsonline.org/jax-medicine/2001journals/dec2001/breastfeeding.htm

La Leche League (2003). Benefits of breastfeeding. Retrieved July 15, 2003 from http://www.lalecheleague.org/NB/NBbenefits.html

Labbok, M.H. (2001). Effects of breastfeeding on the mother. *Pediatric Clinicians of North America*, 48, 143-58.

Lawrence, R.A. (2002). Peer support: making a difference in breast-feeding duration. *Canadian Medical Association Journal*, 166(1), 42-43.

INFACT Canada. (1997). The cost of formula and infant feeding security. Retrieved on October 12, 2003 from http://www.infactcanada.ca/security.htm

Institute de la Statistique du Quebec. (1998-2002) L'Etude du Developpement des Enfants du Quebec (ELDEQ).

Lavin, D. (2001). Improving breastfeeding outcomes. *International Journal of Childbirth Education*, 16(3), 27-33.

Leung, G.M., Ho, L.M., & Lam, T.H. (2002) Breastfeeding rates in Hong Kong: a comparison of the 1987 and 1997 birth cohorts. *Birth: Issues in Perinatal Care*, 29(3), 162-170.

Levitt, C.A., Kaczorowski, J., Hanvey, L., Avard, D., & Chance, G.W. (1996). Breastfeeding policies and practices in Canadian hospitals providing maternity care. *Canadian Medical Association Journal*, 155(2), 181-188.

Lewis, C. (2003). HHS blueprint to boost breast-feeding. *FDA Consumer*, 37(3), 12-17.

Libbus, M.K., & Bullock, L.F. (2002). Breastfeeding and employment: an assessment of employer attitudes. *Journal of Human Lactation*, 18(3), 247-251.

Linet, M.S., Wacholder, S. & Zahm, S. H. (2003). Interpreting epidemiologic research: Lessons from studies of childhood cancer. *Pediatrics*, 112(1), 218-224.

Mackay, M. (2002). Mothers uncomfortable breastfeeding in public. *Australian Nursing Journal*, 10(1), 31.

Martens, P.J., Phillips, S.J., Cheang, M.S., & Rosolowich, V. (2000). How baby-friendly are Manitoba hospitals? The provincial infant feeding study. *Canadian Journal of Public Health*, 91(1), 51-60.

Matthews, K., Webber, K., McKim, E., Banoub-Baddour, S., & Laryea, M. (1998) Maternal infant-feeding decisions: reasons and influences. *Canadian Journal of Nursing Research*, 30(2), 177-198.

McHale, H. & Gutmanis, I. (1999). Breastfeeding duration rates in Middlesex London. London, Ontario: Middlesex-London Health Unit.

McKilligan, H. (1991) Breastfeeding knowledge, attitudes, practice. *Public Health Epidemiological Report*, 1(2), 21-24.

McIntyre, E., Hiller, J.E., & Turnbull, D. (2001) Attitudes towards infant feeding among adults in a low socioeconomic community: what social support is there for breastfeeding? *Breastfeeding Review*, 9(1), 13-24.

McIntyre, E., Turnbull, D., & Hiller, J.E. (1999). Breastfeeding in public places. *Journal of Human Lactation*, 15(2), 131-135.

McLeod, D., Pullon, S., & Cookson, T. (2002) Factors influencing continuation of breastfeeding in a cohort of women. *Journal of Human Lactation*, 18(4), 335-343.

McNally, E., Hendricks, S., & Horowitz, I. (1985). A look at breastfeeding trends in Canada (1963-1982). *Canadian Journal of Public Health*, 76, 101-107.

Meek, J.Y. (2001). Breastfeeding in the workplace. *Pediatric Clinicians of North America*, 48(2), 461-474.

Meyerink, R.O., & Marquis, G.S. (2002). Breastfeeding initiation and duration among low-income women in alabama: the importance of personal and familial experiences in making infant-feeding choices. *Journal of Human Lactation*, 18(1), 38-44.

Mortensen, E.L., Fleischer, K. & Michaelsen, S.A. (2002). The association between duration of breastfeeding and adult intelligence. *Journal of the American Medical Association*, 287(18), 2365-2372.

Moxley, S. & Haddon, L. P. (1999). Teaching breastfeeding to parents expecting multiple births. *International Journal of Childbirth Education*, 14(1), 22-27.

Moxley, S., & Kennedy, M. (1994). Strategies to support breastfeeding. Discarding myths and outdated advice. *Canadian Family Physician*, 40, 1775-1781.

Myres, A. (1979). A retrospective look at infant feeding practices in Canada: 1965-1971. *Journal of Canadian Dietetics Association*, 40, 200-211.

Natural Health Magazine #69. (1999). Canada's first baby-friendly hospital. Retrieved on August 10, 2003 from http://www.life.ca/nl/69/baby.html

Natural Resources Defense Council. (2001). The benefits of breastfeeding. Retrieved on December 10, 2003 from http://www.nrdc.org/breastmilk/benefits.asp

Nolan, L., & Goel, V. (1995) Sociodemographic factors related to breastfeeding in Ontario: results from the Ontario Health Survey. *Canandian Journal of Public Health*, 86(5), 309-312.

Northern Ontario Perinatal and Child Health Survey Consortium. (2003). *Determinants of child health in Northern Ontario.* Public Health Research, Education and Development Program, Sudbury & District Health Unit.

Oddy, W.H. (2002). Asthma in children. *Immunotherapy Weekly*, August 28, 2002, p. 4.

Ontario Ministry of Health and Long-Term Care. (2002). Implementation guidelines for the Health Babies, Healthy Children program-Phase I. Retrieved on January 10, 2004 from http://www.health.gov.on.ca/english/providers/pub/child/hbabies/implem_phase1.html#2

Pisacane, A., Russo, M., Valiani, R. & Florio, C. (1994). Breast feeding and multiple sclerosis. *British Medical Journal*, 308(6941), 1411.

Prince Edward Island Breastfeeding Coalition. (2002) Strategic plan: working to make breastfeeding the cultural norm for infant feeding on PEI: PEI Breastfeeding Coalition. Retrived July 10, 2003 from http://www.gov.pe.ca/photos/original/hss_breastfeed.pdf

Peregrin ,T. (2002) Education, peer counseling, and paternal support: three ways to encourage a healthful breastfeeding schedule. *Journal of the American Dietetic Association*, 102(7), 943.

Peters, K. (1997) Breastfeeding peer counselors at work. *Leaven*, 33(2), 42-44.

Phillip, B.L., Merewood, A., Miller, L.W., & Chawla, N. (2001) Baby-friendly Hospital Initiative improves breastfeeding initiation rates in a US hospital setting. *Pediatrics*, 106(3), 677-682.

Pilkenton, S.B. (2002). History of Breastfeeding. Retrieved on December 15, 2003 from http://www.seldomfar.com/nurturing/bfhistory.htm

Pollock, C.A., Bustamante-Forest, R., & Giarrantano, G. (2002). Men of diverse cultures: knowledge and attitudes about breastfeeding. *Journal of Obstetrics, Gynecologic, and Neonatal Nursing*, 31(6), 573-579.

Prince, M. (2002). More employers are offering lactation rooms for new moms. *Business Insurance*, 36(6).

Radford, A. & Southall, D. P. Successful application of the baby-friendly hospital initiative contains lessons that must be applied to the control of formula feeding in hospitals in industrialized countries. *Pediatrics*, 108(3), 766-768.

Ruowei, L., Grummer-Strawn, L., Zhao, Z., Barker, L., & Mokdad, A. (2003) Prevalence of breastfeeding in the United States: The 2001 National Immunization Survey. *Pediatrics*, 111(5), 1198-1201.

Ryan, A., Alan, S., Pratt, W.F., & Wysong, J. (1991). A comparison of breastfeeding data from the National Survey of Family Growth and the Ross Laboratories Mothers Surveys. *American Journal of Public Health*, 81(8), 1049-1052.

Scott, J.A., & Binns, C.W. (1999). Factors associated with the initiation and duration of breastfeeding: a review of the literature. *Breastfeeding Review*, 7(1), 5-16.

Scott, J.A., Binns, C.W., & Arnold RV. (1997). Attitudes toward breastfeeding in Perth, Australia: qualitative analysis. *Journal of Nutrition Education and Behaviour*, 29(5), 244-250.

Sears, M.R., Greene, J.M., Willan, A.R., Taylor, D.R., Flannery, E.M., Cowan, J.O., Herbison, G.P. & Poulton, R. (2002). Long-term relation between breastfeeding and development of atopy and asthma in children and young adults in longitudinal study. *The Lancet*, 360(9337), 901-916.

Sheehan, D., Krueger, P., Watt, S., Sword, W., & Bridle, B. (2001). The Ontario Mother and Infant Survey: breastfeeding outcomes. *Journal of Human Lactation*, 17(3), 211-219.

Sheehan, D., Bridle, B., Hillier, T., Feightner, K., Hayward, S., Lee, K.S. (1999). Breastfeeding outcomes of women following uncomplicated birth in Hamilton-Wentworth. *Canadian Journal of Public Health*, 6, 408-411.

Sheeshka, J., Potter, B., Norrie, E., Valaitis, R., Adams, G., & Kuczynski, L. (2001). Women's experiences breastfeeding in public places. *Journal of Human Lactation*, 17(1), 31-38.

Sherry, B. & Mei, Z. (2001). Continuation of the decline in prevalence of anemia in low-income infants and children in five states. *Pediatrics*, 107(4), 677-682.

Singhal, A., Cole, T.J. & Lucas, A. (2001). Early nutrition in preterm infants and later blood pressure: Two cohorts after randomised trials. *The Lancet*, 357(9254), 413-419.

Shu, X.O., Linet, M.S., Steinbuch, M., & Wen, Q.W. (1999). Breast-feeding and risk of childhood acute leukemia. *Journal of Nationa Cancer Institute*, 91(20), 1765-1772.

Starbird, E.H. (1991). Comparison of influences on breastfeeding initiation of first-born children 1960-69 vs. 1970-71. *Journal of Social Science and Medicine*, 33(5), 627-634.

Statistics Canada. (2001). Health Indicators. Highlights: Breastfeeding practices. Retrieved March 10, 2003 from http://www.statcan.ca/english/freepub/82-221-XIE/00601/high/breast.htm

Stefuk, W., Green, K.L., Turnell, R., & Smith, B. (2002) Process evaluation of the Saskatoon Breastfeeding Center. *Journal of Human Lactation*, 18(1), 29-37.

Stopka, T.J., Chapman, D., & Perez-Escamilla, R. (2002) An innovative community-based approach to encourage breastfeeding among Hispanic/Latino women. *Journal of the American Dietetic Association*, 102(6), 766-768.

Taveras, E.M., Capra, A.M., Braveman, P.A., & Jensvold, N.G. (2003). Clinician support and psychosocial risk factors associated with breastfeeding discontinuation. *Pediatrics*, 112(1), 108-117.

Thompson, J. Benefits of breastfeeding and current controversies: Part II. *Community Practitioner*, 75(3), 106-109.

Thompson, J. (2003). Health benefits of training mothers in developing countries to breastfeed exclusively for six months. *Community Practitioner*, 76(7), 272.

Thunder Bay and District Health Unit. (2003). Expressing and storing breastmilk. Retrieved on November 3, 2003 from http://www.tbdhu.com/reproduction/breastfeed/StoringExpressingBreastMilk.pdf

Tortora, G.J. & Grabowski, S.R. (2000). *Principles of Anatomy and Physiology (9^{th} ed.).* Toronto, ON: John Wiley & Sons, Inc.

UNICEF. (2002). Current status of baby-friendly hospital initiative. Retrieved on August 10, 2003 from http://www.unicef.org/programme/breastfeeding/assets/statusbfhi.pdf

United States Breastfeeding Committee. (2002). Benefits of breastfeeding. Retrieved August 10, 2003 from http://mchb.hrsa.gov.htm

von Muntis, E. (1997). Towards prevention. *The Lancet*, SII14-SII17.

Wainwright, M. (2003). Wolds find proves that medieval babies stayed healthy for longer on mother's milk. Retrieved on December 10, 2003 from http://www.guardian.co.uk/uk_news/story/0,3604,1027937,00.html

Wall, G. (2001). Outcomes of breastfeeding versus formula feeding. Retrieved on October 4, 2003 from http://www.lalecheleague.org/cbi/Biospec.htm

Weimer, J. The economic benefits of breastfeeding: A review and analysis. Retrieved on December 15, 2003 from http://www.ers.usda.gov/publications/fanrr13/

Williams, P.L., Innis, S.M., & Vogel, A.M.P. (1996) Breastfeeding and weaning practices in Vancouver. *Canadian Journal of Public Health*, 87(4), 231-236.

Williams, P.L., Innis, S.M., Vogel, A.M.P., & Stephen, L.J. (1999). Factors influencing infant feeding practices of mothers in Vancouver. *Canadian Journal of Public Health*, 90(2), 114-120.

Wong, S.C. (2002). Physicians should be educated on the benefits of breastfeeding. *American Family Physician*, 66(2), 209-212.

World Breastfeeding Initiative. (1995). *Alive: Can Journal of Healthy Nutrition*, 155, 56-57.

World Breastfeeding Initiative. (1995). Canadian Journal of Health Nutrition, 155, 56-57.

World Health Organization/United Nations Children's Emergency Fund. (2002). Current status of baby-friendly hospital initiative. Retrieved on November, 2002 from www.unicef.org/prgramme/breastfeeding/assets/statusbfhi.pdf

Wyatt, S.N. (2002). Challenges of the working breastfeeding mother. *American Association of Occupational Health Nurses Journal*, 50(2), 61-66.

Yanicki, S., Hasselback, P., Sandilands, M. & Jensen-Ross, C. (2002). The safety of Canadian early discharge guidelines: Effects of discharge timing on readmission in the first year post-discharge and exclusive breastfeeding to four months. *Canadian Journal of Public Health*, 93(1), 26-30.

Zeretzke, K.M. (1997). Cost benefits of breastfeeding. Retrieved on December 10, 2003 from http://www.prairienet.org/laleche/bfcost.html