A RANDOMIZED CONTROLLED TRIAL EVALUATING THE EFFECT OF PEER (MOTHER-TO-MOTHER) SUPPORT ON BREASTFEEDING DURATION AMONG PRIMIPAROUS WOMEN

by

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ABSTRACT

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While approximately 80% of Canadian women initiate breastfeeding, most mothers cease before the 6 months recommended by the World Health Organization and the Canadian Paediatric Society. To address this health issue, postpartum breastfeeding support programs have been developed by health care professionals. However, evaluations of such professional support interventions have failed to demonstrate significant improvements in breastfeeding outcomes beyond 2 months postpartum. A growing trend in health care, and postpartum care in particular, is the use of lay support. Five studies have been found evaluating the effectiveness of peer (mother-to-mother) support for breastfeeding women; however, due to methodological limitations, the validity of the results are questionable. The purpose of this study was to evaluate the effect of peer support on breastfeeding duration among first-time mothers. Two hundred and fifty-six primiparous breastfeeding mothers were randomly allocated to receive either conventional care or conventional care plus peer support. Volunteers, who were mothers experienced at breastfeeding and were members of a community breastfeeding group, provided telephone support to new mothers within 48 hours of hospital discharge and as frequently thereafter as the individual mother deemed necessary. Mothers in both groups were telephoned by a blinded research assistant, every four weeks for the first three months postpartum. Significantly more mothers in the peer support group continued to breastfeed at 3 months postpartum [χ^2 (1, n=256) = 6.67, p = .01] and all other time periods. Other outcomes included: breastfeeding problems and concerns encountered, health services utilized, maternal satisfaction with infant feeding method, and perception of peer support received. In addition to evaluating the effectiveness of lay support for new breastfeeding mothers, the trial contributed to our understanding of the advantages and disadvantages of using lay helpers as mediating links between health care professionals and clients in the community.

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CHAPTER I

INTRODUCTION

Breastfeeding has been recognized as the optimum food source for infants and has been demonstrated to be the most cost-effective, health-promoting, and disease-preventing activity new mothers can perform (WHO, 1990). Yet the history of infant feeding in 20th century North America is a story of the loss of a breastfeeding culture and the loss of traditional knowledge about how breastfeeding mothers and infants behave, what kind of support they require, and what kind of strengths they possess. During the last century, Europe and North America led the world in the decrease of breastfeeding and exported artificial feeding methods to other countries through the sharing of Western health care techniques and technologies (Mulford, 1995). However, since the 1970s, measures have been taken to promote breastfeeding, through international programs and statements such as the World Health Organization (WHO) Code of Marketing of Breastmilk Substitutes (1981), the WHO/UNICEF Innocenti Declaration (1990), and the WHO/UNICEF Baby-Friendly Hospital Initiative (1991).

The rates of new Canadian mothers initiating breastfeeding have increased from 24% during the 1960s (Myres, 1979) to as high as 83% today (Barber, Abernathy, Steinmetz, & Charlebois, 1997). However, breastfeeding rates rapidly decline in the initial 4 to 8 weeks, and less than 35% of mothers are exclusively breastfeeding at 4 months postpartum (Barber et al. 1997); only 30% to 40% of mothers continue any form of breastfeeding until 6 months (Bourgoin et al., 1997; Health & Welfare Canada, 1990). The breastfeeding duration rates for socially disadvantaged women are even lower (Caulfield et al., 1998; Matthews, Webber, McKim, Banoub-Baddour, & Laryea, 1995). Thus, most women cease breastfeeding before the 6 to 12 months recommended by the Canadian Paediatric Society (1991), and American Academy of Pediatrics (1997) and the 2 years suggested by the WHO (1990). A major reason for this premature discontinuation is difficulty with breastfeeding

rather than maternal choice (Barber et al., 1997; Hill, 1991). In particular, Rogers, Morris, and Taper (1987) found 43% of women indicated that they would have preferred to have breastfed longer.

To address this health issue, postpartum breastfeeding support programs have been developed by health care professionals. However, evaluations of such professional support interventions have failed to demonstrate significant improvements in breastfeeding outcomes beyond 2 months postpartum (Sikorski & Renfrew, 1999). In these trials over 3,600 women in seven countries were studied involving interventions that were comprehensive, individualized, and fairly intensive in the postpartum period. The failure of such trials to show consistent improvements may result not so much from the choice of intervention or program, but rather from the theoretical underpinnings of breastfeeding support forming the basis for the programs. To date, the majority of breastfeeding support programs have been theoretically founded on professional support. While the rationale for linking professional support and health is strong, it may be that professional support alone (regardless of the quality and quantity) is not sufficient to improve breastfeeding outcomes, especially with socially disadvantaged mothers. Furthermore, Eng and Young (1992) have observed that trends in health care have given rise to greater reliance on lay helping. Rapidly expanding medical specialization and technology, while having raised the quality of care to some clients, have also led to less desirable effects including upwardly spiraling costs of care, limited access to care, and reduced interpersonal communication between professional health care providers and their clients. Hence, during times of need, individuals are turning to social networks for support as a remedy to some of the barriers encountered in the present health care system.

This assistance rendered by lay individuals rather than professionals is termed "social support" (Stewart, 1999c), and social support networks have become of particular interest to health professionals due to their positive and cost-effective impact on health (Cohen & Wills, 1985), health behaviours (Berkman, 1995), and health service utilization (Birkel & Reppucci, 1983; Roberts, 1988). The consequence of this growing recognition of social support by professionals is a

proliferation of health care programs in North America incorporating peer lay helpers (Eng & Young, 1992).

This trend towards lay support has been particularly evident in postpartum care where peer lay helpers have been promoted as mediating links between individuals in the community and health care professionals. To determine the effectiveness of lay support with breastfeeding women, five studies have been found evaluating peer (mother-to-mother) support with new mothers (Caulfield et al., 1998; Kistin, Abramson, & Dublin, 1994; Long, Funk-Archuleta, Geiger, Mozar & Heins, 1995; Mongeon & Allard, 1995; Schafer, Vogel, Viegas, & Hausafus, 1998). With the exception for the Mongeon and Allard (1995) trial, these studies are of poor quality indicating that the mostly positive results of these investigations should be interpreted with caution. Due to the fact that only one, but small, methodologically adequate study existed in the extant literature, insufficient conclusions may be drawn about the effect of breastfeeding peer support. As such, there was a need to evaluate the effectiveness of peer support for breastfeeding mothers. The purpose of this study was to evaluate the effect of peer support on breastfeeding duration among primiparous breastfeeding mothers.

REVIEW OF RELEVANT LITERATURE

In this literature review, the benefits of breastfeeding will be presented and the factors influencing breastfeeding duration will be explored. Descriptive and correlational studies related to breastfeeding support will be delineated, highlighting the differences between informal and formal sources of support. In addition, experimental studies (based on a Cochrane review) evaluating the effect of professional support on breastfeeding duration will be discussed. The interface between informal and formal sectors of care will be described leading into a comprehensive discussion of social support. Finally a concept analysis of peer support will be presented to aid in the conceptualization and operationalization of the concept.

Why Breastfeed?

Extensive research, especially in recent years, has shown advantages, particularly to infants, of breastfeeding and the use of human milk for infant feeding. These advantages include health, nutritional, immunologic, developmental, psychological, social, economic, and environmental benefits (American Academy of Pediatrics, 1997). Specifically, epidemiological research has provided evidence that breastfeeding may decrease the incidence and/or severity of several conditions in infants including diarrhea (Beaudry, Dufour, & Marcoux, 1995), lower respiratory infection (Wright, Holberg, Taussig, & Martinez, 1995), and otitis media (Aniansson et al., 1994). A number of studies have showed a possible protective effect of breastfeeding against sudden infant death syndrome (Ford et al., 1993), insulin-dependent diabetes mellitus (Gerstein, 1994), Crohn's disease (Koletzko, Griffith, Corey, Smith, & Sherman, 1991), and lymphoma (Shu, Clemens, Zheng, Ying, Ji, & Jim, 1995). Furthermore, breastfeeding has been related to possible enhancement of cognitive development in infants born prematurely (Lucas, Morley, & Cole, 1998; Morrow-Tlucak, Haude, & Ernhart, 1988).

There are also a number of studies that have indicated possible health benefits for mothers. It has long been acknowledged that breastfeeding increases the level of oxytocin, resulting in less postpartum bleeding and more rapid uterine involution (Chua, Arulkumaran, Lim, Selamat, & Ratman, 1994). In addition, recent research has demonstrated that lactating women may have an earlier return to prepregnant weight (Dewey, Heinig, & Nommsen, 1993), delayed resumption of ovulation resulting in increased child spacing (Kennedy & Visness, 1992), reduced risk of ovarian cancer (Rosenblatt & Thomas, 1993), and premenopausal breast cancer (Newcomb et al., 1994). However, many of these studies are retrospective and have been conducted primarily in Canada, the United States, Europe, and other developed countries among predominantly middle-class populations. Methodological limitations, such as small sample sizes, are also an issue. Despite these

weaknesses, evidence continues to accumulate demonstrating the possible health benefits and other advantages of breastfeeding.

Breastfeeding Duration

With the growing scientific knowledge of the potential benefits of breastfeeding, international and national breastfeeding policies have been acknowledged by health care professionals in their efforts to increase initiation and duration rates. Perhaps as a result of these endeavors, Canadian women initiating breastfeeding have slowly increased from 24% in the late 1960s (Myers, 1979) to approximately 80% today; however, less than 30 to 40% of mothers continue any form of breastfeeding until the recommended 6 to 12 months postpartum (Health Canada, 1990). The breastfeeding duration rates for socially disadvantaged women are even lower (Libbus, Bush, & Hockman, 1997). It appears that the initial 4 weeks in the postpartum period are a critical time for new mother, with the greatest attrition in breastfeeding occurring in this time interval (Goodine & Fried, 1984; Hill & Aldag, 1991).

Furthermore, the breastfeeding duration rates cited in most studies are based upon diverse interpretations of what constitutes 'breastfeeding' which, more often than not, includes some form of infant supplementation with non-human milk. This broad conceptualization of breastfeeding artificially inflates breastfeeding duration rates since infants who receive minimal human milk are frequently incorporated into the calculation of these rates. When breastfeeding is defined as 'exclusive breastfeeding,' which includes no or insignificant supplementation, it becomes apparent that the majority of infants who are classified as 'breastfed' have actually received minimal breast milk, especially after the initial postpartum months (see Figure 1). Thus, the problem of premature discontinuation of breastfeeding is a greater issue then initially perceived.

A major reason for this premature discontinuation of breastfeeding, or the early initiation of supplementation with non-human milk, is due to problems with breastfeeding rather than maternal

choice (Hill, 1991). Nearly all new mothers experience some level of difficulty when they first commence breastfeeding. In a descriptive study of 117 mothers by Kearney, Cronenwett, and Barrett (1990), the top five breastfeeding difficulties reported were: sleepy infant (85%), sore nipples (66%), leaking breasts (59%), infant spitting up (49%), and the mother feeling sad (44%). However, for the

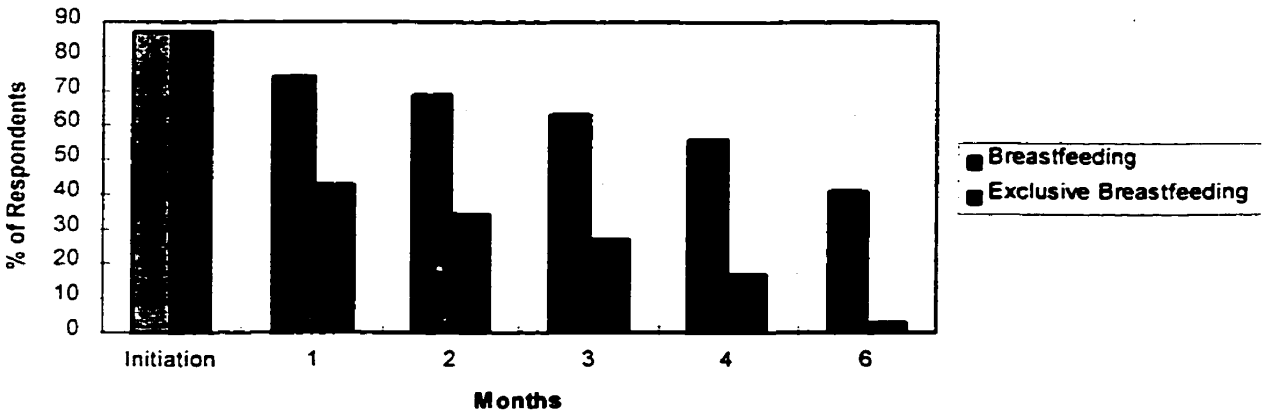


Figure 1. Prevalence of breastfeeding and exclusive breastfeeding from initiation to 6 months (North York Public Health Department, 1994).

past 20 years, the most prevalent justification for discontinuing or supplementing breastfeeding has been "insufficient milk" (Barber et al., 1997; Barron, Lane, Hannan, Struempler, & Williams, 1988; Bloom, Goldbloom, Robinson & Stevens, 1982; Bourgoin et al., 1997; Chalmers, 1995; Cole, 1977; Doren, 1995; Feinstein, Berklhamer, Gruszka, Wong & Carey, 1986; Hawkins, Nichols, & Tanner, 1987; Hill, 1991; Sloper, Elsden & Baum, 1977; Whichelow, 1982; Yeung, Pennell, Leung, & Hall, 1981). Yet it appears unlikely that many women truly experience insufficient milk, since physiological studies have suggested that only 1% to 5% of women have genuine problems with milk production and limited milk supply (Inch & Renfrew, 1995). Thus, the continuation of breastfeeding is a complex interplay of factors influencing and underlying positive breastfeeding behaviours. For instance, rates of breastfeeding have been associated with maternal demographic

characterisitics and attitudes (Nolan & Goel, 1995) while obstacles to successful breastfeeding included health care professional apathy and misinformation (Freed, Clark, Sorenson, Lohr, Cefalo, & Curtis, 1995), disruptive hospital policies (Powers, Naylor, & Wester, 1994), inappropriate interruption of breastfeeding (Freed et al., 1995), maternal employment (Gielen, Faden, O'Campo, & Paige, 1992; Nolan & Goel, 1995), lack of broad societal support (Jacobson, Jacobson, & Frye, 1991; Palmer, 1988), media portrayal of bottlefeeding as normative (WHO, 1981), and commercial promotion of infant formula through distribution of hospital discharge packs, coupons for free or discounted formula, and television and general magazine advertising (Howard, Howard, & Weitzman, 1994). Of these preceding factors, maternal demographics, prenatal attitudes, and hospital policies appear to be particularly instrumental in the initiation and continuation of breastfeeding (Janke, 1993).

Maternal Demographic Variables

A number of maternal demographic characteristics have been associated with the initiation and continuation of breastfeeding. North American women who choose to initiate and continue to breastfeed tend to share the following characteristics: Caucasian (Arafat, Allen, & Fox, 1981; Jacobson, Jacobson & Frye, 1991; Kurinj, Shiono & Rhoads, 1988; Rassin, 1991; Ryan, Pratt, Wysong, Lewandowski, McNally & Krieger, 1991; Ryan & Martinez, 1989), middle to upper class (Bourgoin et al., 1997; Matthews et al., 1995; Ryan & Martinez, 1989; Rousseau, 1982), well educated (Barber et al., 1997; Beske & Garvis, 1982; Bourgoin et al., 1997; Grossman, Fitzsimmons, Larsen-Alexander, Sachs & Harter, 1990; Matthews et al., 1995; Nolan & Goel, 1997; Kurinj et al., 1988), married (Gabriel, Gabriel, & Lawrence, 1986; Ryan & Martinez, 1989), older (Beske & Garvis, 1982; Dusdieker, Booth, Ekwo & Seals, 1984; Fieldhouse, 1984; Ford & Labbok, 1990; Gielen, Faden, O'Campo & Paige, 1992; Matthews et al., 1995; Nolan & Goel, 1997; Goodine & Fried, 1984; While, 1989; Wright & Walker, 1983); nonsmoker (Beaudry & Aucoin-Larade, 1989; Grossman et al., 1990; Nolan & Goel, 1997; Rousseau, 1982), breastfed as an infant (Arafat et al.,

1981; Beaudry & Aucoin-Larade, 1989; Bourgoin et al., 1997; Gabriel et al., 1986), healthy with a healthy infant (Hewat & Ellis, 1984), have friends or family members with breastfeeding experience (Libbus, Bush, & Hockman, 1997), and successful prior breastfeeding experience (Barber et al., 1997; Bourgoin et al., 1997; Grossman et al., 1990; Jones, West, & Newcombe, 1988). Of these variables, education and socioeconomic status are one of the strongest predictors of breastfeeding behaviour (Janke, 1993).

Maternal education. Maternal level of education has been significantly related to breastfeeding duration in both Canada and the United States (Beske & Garvis, 1982; Cole, 1977; Dusdieker et al., 1984; Feinstein et al., 1986; Fieldhouse, 1984; Goodine & Fried, 1984; Greene-Finestone, Feldman, Heick, & Luke, 1989; Grossman et al., 1990; Kurinij et al, 1988; Labbok & Simon, 1988; Lawson & Tulloch, 1995; Matthews et al., 1995; Matich & Sims, 1992; Simopoulos & Grave, 1984; Wright & Walker, 1983). In a review of breastfeeding trends, Ryan, Rush, Krieger, and Lewandowski (1991) reported that women with college education or more were twice as likely to breastfeed compared to women with high school education or less. Moreover, Canadian studies indicated that mothers with higher education breastfeed, on average, three to four months longer than mothers with lower levels of education (Barber et al., 1997; Bourgoin et al., 1997; McNally, Hendricks & Horowitz, 1985; Yeung et al., 1981). Further emphasizing the importance of educational status on positive breastfeeding behaviours, Hellings (1985) found maternal education level to be a significant factor independent of income and Kurinj et al. (1988) determined, through multivariate analysis, that education level has a stronger effect on breastfeeding duration than race or ethnicity.

Socioeconomic status. In addition to and interrelating with maternal education, socioeconomic status, generally measured using household income, level of education, and/or occupation, has been positively correlated to breastfeeding duration (Barber et al., 1997; Beaudry & Aucoin-Larade, 1989; Bourgoin et al., 1997; Greene-Finestone et al., 1989; Matthews et al., 1995;

Nolan & Goel, 1995; Rousseau, 1982; Ryan & Martinez, 1989; Sjolin, Hoffvander, & Hillervik, 1977; Wright & Walker, 1983). Studies of low-income mothers have indicated that those women who did breastfeed were more likely to resemble their higher-income counterparts in that they tended to be older, married, and better educated than low-income women who chose to bottlefeed (Bevan, Mosley, Lobach, & Solimano, 1984; Grossman et al., 1990; MacGowan, MacGowan, Serdula, Lane, Joesoef, & Cook, 1991; Mohrer, 1979). Recognizing the influence of socioeconomic status, many researchers have developed interventions targeting lower-income women (e.g. Caulfield et al. 1998; Grossman et al., 1990; Kistin et al., 1994; Long et al., 1995; Schafer et al., 1998). However, Rogers, Emmett, and Golding (1997) noted that while breastfeeding is positively related to socioeconomic status in North America, there is an inverse relationship in developing countries. It appears that higher income women in these countries perceived breastfeeding as "old fashioned" and a sign of lesser social status. As such, higher-income women bottlefeed to be modern and "westernized." Thus, while demographic factors are consequential in predicting positive breastfeeding behaviours in North America, these variables are confounded by maternal intentions, attitudes, and societal influences.

Maternal Attitudes and Intrapersonal Characteristics

The initiation and continuation of breastfeeding has been shown to be predicted by a range of measures of maternal prenatal intentions, attitudes, and intrapersonal characteristics. Between 50% to 90% of expectant mothers decide how they will feed their infant either before becoming pregnant or very early in pregnancy (Bailey & Sherriff, 1992; Coreil & Murphy, 1988; Dix, 1991; Entwisle, Doering, & Reilly, 1982); pre-pregnancy decision to breastfeed has been associated with breastfeeding duration (Bourgoin et al., 1997; Lawson & Tulloch, 1995). If during pregnancy there is a degree of ambivalence expressed about whether or not to breastfeed, the likelihood of weaning in the early weeks after birth is greatly increased (Hood, Faed, Silva, & Buckfield, 1978). In addition, women who associate breastfeeding with feelings of embarrassment or shame are far less

likely to breastfeed (Dix, 1991; Gielen et al., 1992; Matthews et al., 1995). Similarly, McLorg and Bryant (1989) found three negative attitudes that inhibited breastfeeding: modesty and embarrassment issues, restrictions on lifestyle, and physical discomfort and inconvenience. It is noteworthy that feelings of embarrassment and a reluctance to breastfeed in public seem to be related to socioeconomic status; low-income women are more likely to perceive breastfeeding to be embarrassing than higher-income women (Barron et al., 1988; Dix, 1991; Jones, 1986; McNatt & Freston, 1992; Mohrer, 1979). While negative attitudes are associated with bottlefeeding, positive beliefs are related to breastfeeding as women who intended to breastfeed were significantly more likely to believe that breastfeeding was healthier, easy, convenient, and conducive to freedom (Dix, 1991; Libbus & Kolostov, 1994). Finally, a descriptive study of two groups of breastfeeding women by McNatt and Freston (1992) summarized the influence of attitudes, in combination with thought patterns, on the performance of breastfeeding. Group I included women who considered themselves successful and satisfied with their breastfeeding experience, while Group II included those women who were dissatisfied with breastfeeding. The researchers found that the women in Group I were positive thinkers, problem-solvers, determined to succeed, perceived difficulties as "normal," and continued to breastfeed. The women in Group II were focused on the negative aspects of breastfeeding, self-doubting, anxious, rigid in breastfeeding practices, and more likely to discontinue breastfeeding when confronted with difficulties.

Related to maternal attitudes are interpersonal characteristics such as maternal confidence, which has been significantly related to breastfeeding duration. In a descriptive study of 198 women prenatally, O'Campo, Faden, Gielen, and Wang (1992) examined 11 psychosocial and demographic variables and found that maternal confidence was one of five variables that had a significant influence on breastfeeding duration. Furthermore, when 10 variables were entered into a regression model, maternal confidence was one of the most significant variables affecting anticipated length of breastfeeding. As such, women with low confidence in their perceived ability to breastfeed were at

three times (RR = 3.1, 95% CI = 1.39-6.76) the risk of prematurely discontinuing breastfeeding when compared to very confident breastfeeding women. Similarly, Buxton et al. (1991) found that 27% of women with low maternal confidence in the prenatal period discontinued breastfeeding within the first postpartum week, in comparison to only 5% of the highly confident women ($p < .001$). In a methodological study of 130 breastfeeding mothers, Dennis and Faux (1999) also found breastfeeding confidence to be related to the continuation of breastfeeding at 6 weeks postpartum [$F(118) = 9.89$, $p = <.001$].

In addition, maternal confidence has been associated with perceptions of insufficient milk supply. Hill and Humenick (1996) developed the H & H Lactation Scale to measure a mother's perception of insufficient milk supply. Within this scale, the Maternal Confidence in Breastfeeding Subscale is one of three indicators of perceived insufficient milk supply. As hypothesized, mothers who had lower maternal confidence scores also had a lower level of breastfeeding at 6 weeks postpartum ($r = .66$, $p < .05$). As well, Segura-Millan, Dewey, and Perez-Escamilla (1994) found that maternal confidence related to breastfeeding was associated with maternal perceptions of insufficient milk after 1 week postpartum ($\beta = 3.1$, SE = 1.38, $p = .02$); mothers with more breastfeeding confidence were at lower risk to discontinue breastfeeding prematurely (OR = 21.8, CI = 1.4-34.6). Other intrapersonal variables such as anxiety and self-esteem have been found also to be associated with the initiation and continuation of breastfeeding (McNatt & Freston, 1992).

Hospital Policies

These preceding maternal characteristics are not entirely accountable for breastfeeding outcomes; a number of routine policies and practices, believed to compromise successful breastfeeding, remain in Canadian hospitals today (Levitt, Kaczorowski, Hanvey, Avard, & Chance, 1996). While various hospital practices, including restricted feedings (Renfrew & Lang, 1998a), have been assessed in relation to the continuation of breastfeeding, the effect of early breastfeeding initiation and non-human milk supplementation have been evaluated repeatedly. Numerous studies

have sought to measure the impact of early versus later breastfeeding initiation in the postpartum period; several investigations have showed that infants who were put to the breast immediately after birth were breastfed significantly longer than those infants put to the breast two to three hours after birth (Coriel & Murphy 1988; Taylor, Malani, & Brown, 1986). Specifically, Buxton et al. (1991) conducted a study of 187 pregnant women and, through logistic regression, found that early cessation of breastfeeding was 3 times more likely among women who did not initiate breastfeeding in the delivery or recovery room. However, a meta-analysis of three trials conducted by Renfrew and Lang (1998b) showed that research has not demonstrated a 'critical period' for the first feed in terms of breastfeeding success.

However, research has shown that early mother-infant contact is important to the continuation of breastfeeding. Bernard-Bonnin, Stachtchenko, Girard, and Rousseau (1989) found, from their meta-analysis of four trials, early mother-infant contact to be significantly predictive of breastfeeding at 6 to 8 weeks postpartum. Another meta-analysis of seven studies, conducted by Perez-Escamilla, Pollitt, Lonnerdal, & Dewey (1994), found that early contact had a beneficial effect ($p < .05$) on the likelihood of breastfeeding at 2 to 3 months postpartum among primiparae. Similarly, Buxton et al. (1991) found mothers were 3 times more likely to discontinue breastfeeding if they did not room-in with their infants.

In addition to early contact, supplementary feeds with non-human milk during the first few days after birth has been associated with an increased risk of breastfeeding failure by three month postpartum. Blomquist, Jonsbo, Serenium, and Persson (1994) followed 521 breastfed infants for 3 months and found supplementary feeds with non-human milk, given shortly after birth, were independently associated with early cessation of breastfeeding (OR = 3.9, 95% CI = 2.1-7.2) when compared to no supplementary feeds. Similarly, Bernard-Bonnin et al. (1989) found a negative effect between supplementation and the duration of breastfeeding at 8 weeks postpartum from their meta-analysis. Despite the absence of scientific evidence, some of the reasons most often cited to justify

the routine giving of supplementary fluids include an infant's supposed unsatisfied hunger and thirst, milk insufficiency, and jaundice (Auerbach & Gartner, 1987; Houston & Field, 1988). However, bilirubinemia requiring treatment is most likely in infants who have been supplemented and whose breast access has been restricted (Alexander & Roberts, 1988; Elander & Lindberg, 1986; Gartner, 1994). Given the fact that many infants continue to receive supplementation today (Levitt et al., 1996), it is no surprise that a small meta-analysis of two trials showed that early hospital discharge had some beneficial effects on breastfeeding duration (Renfrew & Lang, 1998c). Thus, the hospital practices of late initiation of breastfeeding, maternal-infant separation, and supplementation may have a harmful effect on the continuation of breastfeeding.

Breastfeeding Support

Also potentially detrimental to the continuation of breastfeeding is the lack of breastfeeding support. The following section will examine both informal and formal sources of breastfeeding support from a multitude of descriptive, correlational, quasi-experimental, and experimental studies; qualitative studies are noticeably lacking in the published literature and will be incorporated where relevant.

Descriptive and Correlational Studies

Mothers' beliefs about the advantages and disadvantages of infant feeding methods arise, in part, from interactions that they may have with various formal (e.g. lactation consultants, nurses, physicians) and informal (e.g. partner, family, friends, peers) network members. These interactions may have either a positive or negative influence towards breastfeeding and have been shown to affect both the initiation and continuation of breastfeeding (Grossman et al., 1990; Lipsky, Stephenson, Koepsell, Gloyd, & Lopez, 1994). Furthermore, the particular sources of support for and against breastfeeding may vary according to the mother's age, socioeconomic status, or ethnic group (Dusdieker, Booth, Stumbo, & Eichenberger, 1985).

Informal sources of support. The mother's partner (usually the baby's father) has repeatedly been identified as the primary source of support (Bar-Yam & Darby, 1997). In North America, several studies have indicated that the mother's partner significantly influences breastfeeding initiation (Black, Blair, Jones & DuRant, 1990; Libbus & Kolostov, 1994). In particular, Freed, Fraley, and Schanler (1992) conducted a survey of 268 expectant couples in prenatal classes and found a strong correlation between fathers' negative attitudes towards breastfeeding and mothers' plan to bottlefeed their infants. In studies conducted after the birth of the infant, the partner's favourable attitude towards breastfeeding again was the most significant factor in the mother's decision to initiate breastfeeding; partners were more important than physicians, lactation consultants, or nurses (Bevan et al., 1984; Bucker & Matsubara, 1993; Libbus & Kolostov, 1994). However, all these studies are limited by their timing and lack of follow-up. Surveys conducted in the prenatal period were arguably more accurate regarding prenatal influences affecting a woman's feeding choice, but it was not clear from these studies whether intent to breastfeed translated into breastfeeding initiation as none of these studies followed the mothers from prenatal through to the postpartum period. Mothers surveyed in the immediate postpartum period regarding breastfeeding influences and intent might have been affected by recall bias, effects of labor medication, and/or the euphoria of the first 24 hours postpartum, but these variables were not examined.

Assessing ethnic differences, Baranowski, Bee, and Rassen (1983) in a descriptive study found that close friends were the most important source of support for African-Americans, while the breastfeeding mother's mother and male partner were more important for Mexican-Americans and Caucasians, respectively. However, subsequent studies have either controlled for the confounding variable of race (Giugliani et al., 1994) or found that African-American mothers rated the influence of their partners similarly with mothers from other ethnic backgrounds (Black, Blair, Jones, & DuRant, 1990; Bevan et al., 1984; Freed, Fraley, & Schanler, 1992).

Studies examining the factors associated with breastfeeding duration also point to the importance of partner's support (Bar-Yam & Darby, 1997). Furthermore, the partner's socioeconomic status is also a determining factor in breastfeeding duration, in that low-income partners are less likely to be supportive of breastfeeding than are their upper-income counterparts (Bevan et al., 1984; Bloom et al., 1982; Matich & Sims, 1992). This point was further validated by Rajan and Oakley (1990) who found 18% of working class women versus 4% of middle class women said their partners were unsupportive of breastfeeding. Alternatively, low-income women who did breastfeed indicated that the baby's father favoured breastfeeding and was actively supportive (Barron et al., 1988; Mohrer, 1979).

Although the mother's partner is an important source of support, other individuals also influence the mother's infant feeding decisions. Specifically, women who are most likely to choose to breastfeed initially and for a longer period have, compared with the general population, more friends who have breastfed and more support from family and friends (Buckner & Matsubara, 1993; Ekwo, Dusdieker, Booth, & Seals, 1984; Hellings, 1985; Matich & Sims, 1992; McNatt & Freston, 1992; Simopoulos & Grave, 1984). In particular, a cross-sectional study of 100 breastfeeding and 100 non-breastfeeding women found that the support from a "non-health professional" other than the mother's partner increased the odds of breastfeeding by a factor of 3.3 (Giugliani et al., 1994). The role of friends appears to be particularly important with low-income women as Labbok and Simon (1988) found that the influence of friends within this socioeconomic group outweighed the influence of health care professionals. Comparable results were found by Adair (1983), Matich and Sims (1992), and Rentschler (1991). Friends also appears to be significant with young mothers as Joffe and Radius (1987) found the peer group to be one of the most important sources of influence for adolescents regarding infant feeding. Similarly, Lizarraga, Maehr, Wingard, and Felice (1992) reported that young mothers (age 14-18 years) were more likely to chose breastfeeding if they had been exposed to other women who had breastfed.

Formal sources of support. These descriptive and correlational studies revealed that, in ranking sources of support in terms of their importance and degree of influence on infant feeding practices, the mother's partner is generally the most important and influential source of support, followed by female friends and family members (Albers, 1981; Beske & Gravis, 1982; Cronenwett & Reinhardt, 1987). Health care professionals were rarely perceived as a source of influence and support to the breastfeeding family (Dusdieker et al., 1984; Labbok & Sims, 1988). This contrasts with the perceptions of health care providers themselves. In a survey of 2400 pediatricians, obstetricians, family physicians, and nurses, Lawrence (1984) found that these professionals rated the prenatal instructor, pediatrician, family physician, and obstetrician as the most important sources of influence on mothers' decisions about infant feeding method. The health care professionals viewed the influence of friends, husbands, and relatives as being of secondary importance. However, this is an older study and it is unknown what health care professionals perceptions are today.

In addition to detrimental hospital policies and practices, health care professionals can be a negative source of support due to inconsistent, inaccurate and/or inadequate breastfeeding information and recommendations (Coreil, Bryant, Westover, & Bailey, 1995; Humenick, Hill, & Spiegelberg, 1998); poor recommendations often result from a weak knowledge base rather than negative attitudes towards breastfeeding (Coreil, et al., 1995). For example, in a survey of more than 1,300 health care professionals including nurses, pediatricians, obstetricians, and family physicians, the majority of respondents reported that they advocated breastfeeding; however, 86% of pediatricians and 80% of family physicians recommended supplementation with non-human milk sometimes or always (Lawrence, 1984). An unsatisfied or hungry baby was seen as an important reason to discontinue breastfeeding by 50% of physicians and 70% of nurses. Winikoff, Laukaran, Myers, and Stone (1986) found similar results, with only 55% of obstetrical residents and 81% of nurses recommending exclusive breastfeeding. No pediatric resident and only 3% of nurses would suggest increasing the frequency of breastfeeding as a remedy for insufficient milk. Again, these

studied are older and before the Baby Friendly Hospital Initiative (WHO/UNICEF, 1991); however, a recent Canadian investigation of over 325 obstetricians, pediatricians, family practitioners revealed that health care professionals continue to receive inadequate training in relation to breastfeeding (Burglehaus, Smith, Sheps, & Green, 1997). This result has serious implications since this study also found that physicians attempted to convince women to breastfeed only if they were confident in their own breastfeeding counselling skills (OR = 1.88, SE = 0.36). To highlight the detrimental implications of inadequate breastfeeding counselling, Humenick et al. (1998) found primiparous women were more likely to decrease their level of breastfeeding if a health care professional encouraged supplementation with non-human milk or weaning.

Descriptive studies assessing women's perceptions of the support provided by health care professionals have yielded comparable results. Although a small study, Whitley (1978) followed 34 breastfeeding mothers for the first postpartum year and found that 50% of those who consulted a physician and 67% of those who deliberated with a nurse concerning breastfeeding problems felt that the advice provided was inadequate for their needs. In a larger study of 194 postpartum women (Ellis & Hewat, 1984), hospital nursing staff were found to be generally helpful, although mothers also commented that the nurses seemed rushed and did not have time to help. Conversely, Mongeon and Allard (1995) reported that 71% of women in their study (n = 194) felt that a nurse would not have been any better able to help them with breastfeeding than their volunteer peer counsellor. This finding was further validated by Barber et al.'s (1997) survey of 345 Canadian mothers who felt they received just as good advice from nonprofessional as professional sources of support. Thus, mothers' perceptions of professional support as inadequate have changed little over the past 20 years.

In two qualitative studies, Hewat and Ellis (1984) and Maclean (1990) noted that health care professionals were perceived as either supportive or unsupportive by breastfeeding mothers. Hospital practices such as putting the baby on a feeding schedule, separating the mother and baby right after birth, and giving non-human milk supplements were generally perceived as unsupportive by

breastfeeding mothers, as were criticism and pessimistic comments which served to undermine the mother's confidence in her ability to breastfeed at a particularly vulnerable time. Furthermore, conflicting advice from health professionals was cited as one of the prevalent complaints in both the Hewat and Ellis and Maclean studies. Mothers also reported the difficulty of dealing with "expert" advice that did not correspond to their own experience or intuition. These studies recognize mothers' need for encouragement, positive feedback, and the desire to be "mothered" themselves (Bottorff, 1990).

Experimental and Quasi-Experimental Studies

A systematic review of 13 controlled trials evaluating breastfeeding support interventions has been published recently (Sikorski & Renfrew, 1999). These trials, with the exception of one study involving peer counsellors (Mongeon & Allard, 1995), compared standard care with an additional support intervention by health care professionals (nurse, lactation consultant, or other health care professional) with the purpose of facilitating continued breastfeeding (Appendix A). The results of the meta-analysis indicated that professional support interventions may provide a small overall beneficial effect on the duration of any breastfeeding [relative risk for stopping breastfeeding before the time of the last study assessment up to six months 0.90 (95% CI = .0.82-0.97)]. Specific analysis of the results, at different periods of follow-up, demonstrated a clear benefit of distinct forms of support at 2 months postpartum (RR = 0.74, 95% CI = 0.65-0.86) but no clear evidence of benefit at 3 months (RR = 0.94, 95% CI = 0.81-1.10). On the basis of the reduction in risk for stopping breastfeeding by two months, nine mothers (95% CI = 6-21) would need to be provided with support to ensure one extra mother breastfed her infant until 2 months of age. Analysis of studies reporting a predominantly face-to-face intervention showed a benefit on breastfeeding duration (RR = 0.85, 95% CI = 0.74-0.97) while those using mainly telephone contact did not (RR = 0.98, 95% CI = 0.88-1.09). No clear advantage was found between an antenatal element to the support intervention (RR = 0.83, 95% CI = 0.74-0.94) in comparison to one containing postnatal

support only (RR = 0.92, 95% CI = 0.86-0.98). Finally, a sub-analysis only involving studies evaluating the effect of professional support on low-income populations did not demonstrate a significant benefit (RR = 0.82, 95% CI = 0.62-1.08).

From this systematic review, there is evidence to suggest that face-to-face professional support may increase the proportions of women who continue to breastfeed but only until 2 months postpartum. Furthermore, Sikorski and Renfrew (1999) indicate that the effect of peer support has not yet been adequately established and recommend further research in order to draw more definitive conclusions. This recommendation is very timely since there is a current trend in health care towards the utilization of lay support systems to complement professional health services (Stewart, 1990c). This new health care direction has been particularly evident in perinatal care where peer lay helpers have been used as mediating link between mothers in the community and health care professionals (e.g. Cox, 1993; Heins, Nance, & Ferguson, 1987; McFarlane & Wiist, 1997; Warrick, Wood, Meister, & de Zapien, 1992). Moreover, breastfeeding women have been especially targeted as five studies have been found evaluating the effect of peer support on breastfeeding duration with new mothers (Caulfield et al., 1998; Kistin et al., 1994; Long et al., 1995; Mongeon & Allard, 1995; Schafer et al., 1998) (Table 2).

However, with the exception for the Mongeon and Allard (1995) trial, these studies are of poor quality. Experimenter biases pose a serious threat to validity as outcome assessments were not blinded. No study performed an "intent to treat" analysis and power analyses were not used to determine sample size requirements. Finally, high attrition rates with minimal explanation of participant losses and the use of non-randomized allocation to study groups in all four studies indicate that the results of these investigations should be interpreted with caution. Due to the fact that only one small, methodologically adequate study existed in the extant literature, insufficient conclusions may be drawn about the effect of breastfeeding peer support. Therefore, there is a continuing need to evaluate the effect of peer support on breastfeeding duration with new mothers.

Table 2

Characteristics of Breastfeeding Peer Support Trials

Author	Methods	Participants	Intervention	Results
Kistin et al. (1994)	Quasi-experimental - mothers consecutively assigned based on availability of counsellors	92 women who attended a prenatal infant class or delivered at Chicago's public hospital Cook County	- telephone contact prenatally and twice a week after delivery until breastfeeding is established and every two weeks for the next two months	Significant difference between groups ($p < .05$) for breastfeeding initiation (93% vs. 70%), exclusivity (77% vs. 40%), and duration (mean of 15 weeks vs. mean of 8 weeks)
Long et al. (1995)	Quasi-experimental - historical controls	141 pregnant Native American women enrolled in Utah State WIC program	- contact by telephone, home visits, and clinic visits prenatally, and at one, two, and four weeks postpartum	Significant breastfeeding difference between groups at initiation (84% vs. 70%, p = .05), but not at 12 weeks postpartum (p = .08).
Mongeon & Allard (1995)	Randomized controlled trial	194 pregnant women in Montreal	- telephone contact prenatally and postnatally	No significant breastfeeding duration differences were found between groups (only 30% of all mothers continued to breastfeed)
Schafer et al. (1998)	Quasi-experimental -2 intervention and 6 control counties	134 pregnant rural, low-income women who qualified for Iowa State WIC program	- face-to-face contact prenatally and postnatally with telephone contact	Significant breastfeeding duration differences between groups (p<.001) at 2, 4, 8, and 12 weeks
Caulfield et al. (1998)	Quasi-experimental - 4 WIC clinics randomly allocated to receive intervention	548 pregnant low-income WIC women in Baltimore City, Maryland -only 242 mothers in analyses	- 3 prenatal and weekly postnatal face-to-face and telephone contact	Significant breastfeeding differences between groups at initiation (p <.05, OR = 3.84, 95% CI = 1.44 -10.21) but not at 7 to 10 days postpartum (OR = 1.11, 95% CI = .34 - 3.61).

While it is important to evaluate these peer support interventions, it is also essential to understand why health care professionals are turning to this lay source of support. The failure of the breastfeeding support trials to show consistent improvements beyond 2 months postpartum may result not so much from the choice of intervention or program or how long it continues, but rather from the theoretical underpinnings of breastfeeding support forming the basis for these programs. To date, the majority of breastfeeding support programs have been theoretically founded on professional support. While the rationale for linking professional support and health is strong, it may be that professional support alone (regardless of the quality and quantity) is not sufficient to improve

breastfeeding outcomes, especially with socially disadvantaged mothers (as the systematic review indicated).

Interface Between Informal and Formal Health Care Sectors

The query about the effectiveness of the exclusive use of professional support to address the health care requirements of individuals is not novel (Gottlieb, 1985; Katz, 1985; Levin, Becker, Bone, Hill, Tuggle, & Zeger, 1994; Stewart, 1990b, 1990c; Stewart & Tilden, 1995). Part of professionals' inability to meet health care needs is due to current directions in the delivery of health care which have given rise to greater reliance on lay helping. Rapidly expanding medical specialization and technology, while having raised the quality of care for some clients, have also led to less desirable effects including upwardly spiraling costs of care, limited access to care, and reduced interpersonal communication between professional health care providers and their clients (Eng & Young, 1992). Hence, during times of need, individuals are turning to social networks for support as a remedy to some of the barriers encountered in the present health care system. This lay support has been defined by Caplan (1974) as:

> an enduring pattern of continuous or intermittent ties that play a significant part in maintaining the psychological and physical integrity of the individual over time. Support systems are attachments among individuals or between individuals and groups that serve to improve adaptive competence in dealing with short-term crises and life transitions as well as long-term challenges, stresses, and privations. (p. 7)

Hence, lay support systems have the same ostensible goal of promoting the well-being of their members as do professionals in promoting the health of their clients (Eng, Hatch, & Cunningham, 1985). Often described as the "hidden health care system," individuals in this lay system may engage in communication, collaboration, and partnership with professionals to supplement each other's

services (Eng & Young, 1992). Thus, the lay support system is not viewed as a replacement for professional services but rather as an additional source of support which can negotiate with health care professionals for a more comprehensive and longer-lasting quality of care for individuals (Levin & Idler, 1981).

Social support, the assistance rendered by the lay system, is a salient concept for health scientists due to its positive impact on health (Cohen & Wills, 1985), health behaviours (Berkman, 1995), and health service utilization (Birkel & Reppucci, 1983; Roberts, 1988). The recognition of social support's influence on health status and behaviours is reflected in recent health care trends where health care delivery has become more health-promotive and disease-preventive (Stewart & Tilden, 1995). Acknowledging the greater benefits of preventing illness rather than treating it, health promotion encompasses not only nutrition, weight control, exercise, and stress management, but also the seeking of supportive relationships within an interpersonal network (Stewart & Tilden). Furthermore, the World Health Organization (1984) has identified strengthening social networks as a health promotion strategy and the augmentation of supportive resources, through health promotion mechanisms such as self-care, mutual aid, and healthy environments, have been endorsed by Health Canada (Epp, 1986).

While health-promoting strategies are the current trend underpinning the contemporary health care system, health care finances and population demographics have lead to another direction in the delivery of health care. With shortened hospital stays, longer life expectancy, and an increase in chronic, long-term illnesses, the responsibility for care is now located within communities, situating social networks central to the delivery of health care (Stewart & Tilden, 1995). Recognizing that health care professionals alone have not been able to address the evolving health needs and current health care financial constraints, consumers have initiated a revolution which has brought the lay self-help movement center stage in the health care arena (Stewart & Tilden). This movement specifically incorporates indigenous lay helpers with experiential knowledge who extend

natural networks and supplement professional services. The response to the preceding consumer demand and the growing recognition by health care professionals of the importance of social networks has been a proliferation of programs in North America incorporating peer lay helpers (Eng & Young, 1992).

As the health care system changes one is aware that care can be provided from a variety of sources: public (state), private (market), volunteers, and family and friends (Graham, 1991). This multiple approach to health care has been referred to as either the "mixed economy" of care or "health care pluralism" and its value is believed to widen choice, flexibility, innovation, competition, and complementation (Graham). In the extensive literature on the approaches to care, a familiar sociological distinction between formal and informal care has been delineated; when the patterns of care are reviewed, particular attention can be drawn to the significant contribution that the informal sector makes to health care (Graham). In attempts to describe the nature of the care provided in the informal sector, some general, but not all inclusive, characteristics can be outlined. For example, care in the informal sector: (1) occurs within the private and invisible domain in society, (2) incorporates both the natural (e.g. family and friends) and voluntary (e.g. peer lay helpers) sources of health care, (3) is delivered by lay individuals who are either related or indigenous and possess experiential knowledge, (4) is based on availability and required needs with no set pattern of activity, and (5) involves minimal or no monetary compensation (Angus, 1995; Graham,; Stewart, 1990c). In contrast, care in the formal sector: (1) occurs in the public and visible societal domain, (2) includes both the public and private sources of care, (3) is delivered by unrelated experts with professional knowledge, (4) is directable and controllable through professional codes, institutional standards, and delineated work hours, and (5) incorporates monetary compensation for the set patterns of activities by the professionals (Angus; Graham; Stewart).

Understanding these differences in the sources of care and the defining assumptions/characteristics between the health care sectors is an important first step when exploring

alternatives to traditional methods of care such as the incorporation of peer lay helpers. For as Katz (1985) and Hildingh, Fridlund, and Segesten (1995) recommended, professionals must pay attention to how lay organizations can be more fully used in serving clients since effective public participation requires that professionals be knowledgeable about community groups and willing to participate in a collaborative, facilitative, consultative, partnership relationship with lay helpers (Gottlieb, 1985; Stewart, 1988). As suggested by professionals, it is through this understanding that a useful interface between health care professionals and lay helpers may be promoted to develop comprehensive and complementary health care programs (Clarke, Beddone, & Whyte, 1993; Cox, 1993; Gottlieb, 1985; Gottlieb & Farquharson, 1985, Jackson, Brady, & Stein, 1999; Levin & Idler, 1981; Levine, Becker, Bone, Hill, Tuggle, & Zeger, 1994; Stewart, 1990b; Stewart, Banks, Crossman, & Poel, 1995; Trojan, 1989).

In summary, the use of professional services alone have been questioned by some due to their inability to completely meet the health care needs of contemporary society. The recent increased reliance on lay support, due to changing health care times, has heightened this professional limitation. With the documented benefits of health outcomes and health service utilization, and in response to consumer movements, creating social networks through the utilization of lay helpers has been initiated by professionals to enhance quality of care. However, it is essential to understand the differences between the care provided in the informal and formal sectors such that a clear and efficient interface can be developed to supplement each other's care. One important and widely researched distinction between the care rendered by the informal and formal health sectors is the provision of social support by lay individuals versus the professional support delivered by trained health care providers.

Social Support

Interest in the concept of social support began in the mid-1970s with the publication articles by Caplan (1974), Cassel (1976), and Cobb (1976) reviewing the deleterious effects of social isolation or low social integration on health outcomes. With the development of the term social support and several complementary definitions, a rapid surge of research activity unfolded in the fields of anthropology, behavioural medicine, epidemiology, nursing, psychiatry, psychology, and sociology. To date, thousands of social support research articles, conceptual papers, and literature reviews have been published in a wide array of journals and several books have been devoted exclusively to the concept. Through this empirical and theoretical work, significant advances have been made towards the conceptual refinement, operationalization, and clinical investigation of the social support concept.

Conceptualization of Social Support

Currently, it is generally acknowledged that social support is the provision of emotional, instrumental, informational, and appraisal assistance (House, 1981; House & Kahn, 1985) rendered by lay individuals who are members of the focal person's social network (Stewart, 1989a). A social network is a structural interrelationship among a defined set of lay individuals (Tilden, 1987) who are either socially embedded (family, friends, neighbours, co-workers) or created (volunteers, community leaders, indigenous lay helpers) (Stewart, 1989a). Commonly accepted norms, values, experiences, or demographics typically define created network members to one another (Eng & Young, 1992). Social support is not rendered by health care experts, such as registered nurses or physicians, as professional support is best thought of as surrogate support that extends or replaces support that is not available in the client's own network (Norbeck, 1988; Stewart, 1989a). According to Stewart (1990c), social support can either be enacted or perceived and can be described and interpreted from the distinct, yet often interlocking, theoretic viewpoints of attribution (Brickman, Kidder, Coates, Rabinowitz, Cohen, & Karunza, 1983), coping (Lazarus & Folkman, 1984),

loneliness (Rook, 1985), self-esteem (Muhlenkamp & Sayles, 1986), social comparison (Sanders, 1982), social exchange (Greenberg & Westcott, 1983), social interaction (Tilden, 1985), social learning (Bandura, 1977), and social movements (empowerment) (Cohen, 1985).

Description and Measurement of Social Support

Lay social networks comprise of: (1) *structural* characteristics which refer to the connections in the overall network and include size (the number of people in a network) and density (the extent to which people in a network could/do know one another); (2) *functional* characteristics which incorporate provision of social support functions (such as emotional support), development of new social contacts, and maintenance of social identity, and (3) *interactional* (nature) characteristics which refer to the nature of the relationships themselves such as reciprocity (the extent to which support is both given and received), durability (how long persons in the network have known each other), intensity (the frequency of interactions among network members) and dispersion (the ease with which network members are able to contact each other) (Eng & Young, 1992; House & Kahn, 1985; Israel, 1985). It is through these network characteristics that social support primarily has been described, measured, and examined.

Structural. The structural aspect of social support relationships comprises of three dimensions: (1) source of support, (2) disposition, and (3) duration (Stewart, 1989b). Even though the type of support rendered varies according to the source, the most frequently described and measured sources of support are embedded social networks such as family members, friends and spouse/partner. Moreover, while not a component of social support networks, health care professionals are regularly included as a source category in nurse-developed instruments due to the belief that health care professionals are a legitimate source of temporary surrogate support that should be considered along with or secondary to the more usual lay sources (Stewart). However, while investigators are quick to incorporate professional support in social support measures, they have traditionally underestimated or neglected community-level sources of support such as mutual

aid groups, indigenous helpers, community leaders, volunteers, and neighbours (Stewart). This is a serious gap in the measurement of social support.

Another structural aspect of social relationships is the disposition or the availability (perceived) and enactment (received) of support. Perceived support is the cognitive appraisal of being reliably connected or having access to others while received support refers to the actual use of these support resources. Interestingly, research has shown that the perception or belief that support is available is much more efficacious in some contexts (e.g. mental health) than the actual receipt of social support (Wethington & Kessler, 1986). The use of support is influenced by both individual and network variables; the extent an individual seeks and utilizes support may rely on perceptions of types and sources of help available, frequency of interaction, personal independence, satisfaction with support rendered in the past, number of friends and friend accessible and willing to provide support, and degree of reciprocal helping (Gottlieb, 1985; Stewart, 1989b).

To measure the disposition of social support, perceived and received support are frequently described: however, received support can be also evaluated through individuals' satisfaction with the enacted assistance (Stewart, 1989b). Most measures of support only focus on description even though to fully understand the social support concept and individuals' satisfaction with specific types of support received, evaluation is essential. Also lacking frequently in evaluations is the duration of social support. This structural dimension is important since social support plays a continual role in health maintenance (Stewart). Because many stressful situations have distinct phases requiring altering forms of support (Jacobson, 1986) and some stressors may necessitate more long-term support than others (Tilden, 1986), it is salient that researchers evaluate duration such that health care professionals know how much support is required to successfully implement effective interventions (Stewart).

Functional. The functional component of social support relationships involves different types of assistance. One conceptualization commonly used includes the following resources: emotional

(e.g. esteem, affect, trust, concern, listening), appraisal (e.g. affirmation, feedback, social comparison), informational (e.g. advice, suggestions, directives), and instrumental support (e.g. money, labour, time, modifying environment) (House, 1981; House & Kahn, 1985; Stewart, 1989b; 1990c). The kind of support appropriate for a given situation is influenced, at least in part, by the nature of the stressful situation, the timing of support, and the resources of the focal person (Dimond & Jones, 1983; Hupcey, 1998). Thus, assessment of the kind of support provided in specific situations aids in the understanding of the clinical possibilities for intervention (Stewart, 1989b).

Interactional. Within the interactional aspect of social support relationships there are three dimensions: (1) positive and negative support, (2) direction, and (3) level. While the positive aspects of social support have been the primary focus of investigators, negative issues are now beginning to be illuminated; these negative aspects will be more thoroughly discussed later in this chapter. Generally, at issue here are the costs and benefits associated with giving and receiving help and the importance of reciprocity. Reciprocity is the perception of bi-directional exchange of valued resources and costs are the perceptions of effort expended and debits incurred (Stewart, 1989b). Support may be perceived as unhelpful; therefore, support measures should distinguish between network members who provide positive forms of social support and those who are sources of negative interaction. This is particularly important since perceptions of benefit or costs can affect perceptions of support availability and help-seeking. Furthermore, while social support is both given and received, the majority of instruments emphasize receipt rather than provision or reciprocal exchange of support (Stewart). However, social support should be examined within the context of social influence processes entailing obligation and rewards since unidirectional support over time prevents unpleasant feelings of indebtedness and dependency. One indirect method to assess the negative and reciprocal aspects of support may be through individuals' ratings of their network members (Stewart).

Finally, level of support is perhaps the most difficult dimension to delineate and, hence, to evaluate. Few researchers that have measured level of support and when they do Likert scales are frequently used and assumed to equate to measures of level. Frequency of interaction and intensity of relationship are relevant variables. Furthermore, some sources of support may be more significant than others. Intimacy or intensity reflected in close relationships is another component of the level dimension. Where level is measured it seems to be associated with only one dimension rather than encompass a combination of many dimensions such as source, type, duration, cost, and frequency. It appears that the one-shot questionnaire approach used in most studies is inadequate (Stewart, 1989b).

In summary, social support is the perceived or received emotional, appraisal, instrumental and informational support by either socially created or embedded lay network members. Norms of equity and reciprocity suggest it should be bi-directional and it may involve benefits and costs for both recipients and providers. Numerous instruments, each with different focuses on the structural, functional, and interactional aspects of the social support, have been developed to measure social support and aid in the implementation of effective clinical support interventions.

Clinical Support Interventions

Support interventions are efforts to optimize the psychosocial resources which individuals tender and receive in the context of their relations with their social network (Gottlieb, 1988; Stewart, 1989a). Interventions can be distinguished between those which increase network size, change the structure of the network, reinforce existing relationships, change the content of exchanges, or create ties between formal and informal systems and have diverse goals such as health promotion, primary, secondary, and/or tertiary prevention (Israel, 1985). However, most nursing, medical, and social-psychological empirical investigations have simply examined the social support currently existing in the natural environment with a limited number of efforts to facilitate, enhance or mobilize the informal networks of the target populations (Stewart). This is a significant gap since professional

practice includes many support-enhancing interventions and evaluated clinical interventions are required to provide evidence-based practice.

A typology of intervention levels has been derived by Gottlieb (1988) to help promote and guide social support intervention strategies. Intervention strategies can be directed at the individual, dyad, group, social system, community, or be multilevel and encompass health care professionals' role in facilitating social support by strengthening or maintaining an existing social network or by grafting on new ties (Stewart, 1989a). Specifically, the intervention levels are as follows: (1) individual-level interventions concentrate on modifying how the individual elicits or evaluates support rendered by others and on improving social skills necessary to form and sustain supportive peer ties; (2) dyadic, or microlevel, support strategies can accentuate the introduction of supportive lay helpers who are either socially embedded or created network members, or promote improvement of the amount, regulation and quality of communication between professionals and clients and their proximal network members; (3) group, or mezzo, level interventions either optimize support provided by the existing network, or graft on a set of new ties for target populations at risk due to social isolation, losses from the social network, or other stress-related experiences; (4) social system, or macro, level interventions consist of role definitions entailing more continuous support and organizational policy/structural changes aiding or removing barriers to expression of support; (5) community level interventions, also described as community utilization, frequently refers to mass educational campaigns designed to create a climate favourable to help-seeking and help-giving among the public and to promote awareness and acceptance of social support; (6) multilevel intervention approach can reflect the underlying premise of multiple causation for complex social and health problems (Gottlieb). All of these preceding clinical support interventions, with their numerous applications and clinical implications, illustrate the enormous effect that social support could assert on individuals' health. Of particular interest with breastfeeding women is the application of dyadic level support interventions. Specifically, experienced mothers (created network members)

are introduced to new mothers to help them continue to breastfeed through the provision of peer support.

Concept Analysis of Peer Support

Peer support is a salient concept for health care professionals, especially in these dynamic health care times which has seen a greater reliance on lay assistance by created networks in addition to embedded network members (Cox 1993; Eng & Young 1992). In order to fully maximize the benefits of peer support interventions, it is essential that health care professionals have a clear and concise understanding of the concept. However, peer support is a complex phenomenon whose application has remained vague or highly variable. Despite its ambiguity, its essence continues to be sought after as a means for improving client outcomes. The purpose of this analysis is to provide an enhanced understanding of the term 'peer support' through the general use of Walker and Avant's (1988) concept analysis methodology. The goal is to provide concept refinement in order to aid in the measurement of peer support and the implementation of peer-related support interventions.

What Is Peer Support?

Etymological investigation of the derivation of the noun 'peer' leads to the Latin word *par* which means 'equal.' The New Lexicon Webster's Encyclopedic Dictionary (1988) defines the noun term as follows: 'a member of one of the British degrees of nobility: a duke, marquis, earl, viscount, or baron; a nobleman of any country; someone having the same status in rank, age, ability etc. as another.' Similarly, the Oxford Dictionary of Current English (1991) defines the noun 'peer' as 'one who is equal to another in rank, standing, merit, etc.; member of one of the degrees (duke, marquis, earl, viscount, baron) of nobility in United Kingdom; noble of any country.' In addition to lexicon definitions, synonyms for peer include: equal, equivalent, match, colleague, and compeer (Roget, 1990).

In contrast, the term 'support' is etymologically from the Old French word 'supporter' which was originally derived from the Latin word *porto* which means 'to carry.' The New Lexicon Webster's Encyclopedic Dictionary (1988) notes two uses of the term 'support': (1) 'to carry the weight of; to prevent from falling, sinking etc.; to be actively in favour of; to assist or strengthen morally; to be or provide an argument in favour of or additional evidence for; to bear, endure; to bear the cost of providing for; to give assistance to; to act with in a secondary role; to second;' and (2) 'a supporting or being supported; someone who or something which supports; a means of sustenance.' Likewise, the Oxford Dictionary of Current English (1991) defines 'support' as: (1) 'carry all or part of weight of, keep from falling or sinking or falling; provide for; strengthen, encourage, give help or corroboration to; speak in favour of; be actively interested in; take secondary part to; endure, tolerate' and (2) 'supporting or being supported; person or thing that supports.' Synonyms for support, located in Roget's Thesaurus (1990), include: hold up, sustain, aid, encourage, fortify, endorse, and advocate.

Based on the preceding linguistic definitions of the terms 'peer' and 'support' it could be postulated that 'peer support' is the giving of assistance and encouragement by an individual who is an equal. However, this rudimentary interpretation does not satisfy the need to understand the concept, as this definition is too simplistic to be meaningful; therefore, it is beneficial to consult the literature for an in-depth analysis of the peer support construct.

In relation to health care, the understanding of peer support is immersed in the comprehension of social support. According to Stewart (1990c) "social support is emotional concern, appraisal (feedback), and material and informational assistance, perceived by focal persons to be provided (enacted) by members of their embedded social network (e.g. kin, friends, neighbours, co-workers, church members) and/or their created social network (e.g. indigenous lay helpers, volunteers, self-help groups) in their social environment and resulting in connections (social embeddedness) between focal persons and their environment" (p 26). Established within this

definition, peer support is a *type* of social support that involves informational, appraisal, and emotional assistance (Katz, 1985) based on *experiential knowledge* from a *created* social network (Stewart) which possesses *similar* and/or *indigenous* qualities (e.g. social, ethnic, and environmental subculture) (Giblin, 1989). This explicit, yet broad, definition transcends the traditional view of peer support, which has been primarily restricted to counselling by lay individuals during times of stress. As the subsequent literature review I illuminates, the present-day support interventions by peer lay helpers are diverse, varying across populations and health situations, and frequently reflect a health promotion philosophy.

Peer Support Literature Review

Peer support, and the integration of peer lay helpers, has been the focus of commentary and investigation from varied disciplines over the past two decades. Since the provision of health care services are continually changing, only recent literature from the social-psychological, nursing, and medical domains will be described in order to delineate the current contextual usage of peer support. The study of peer support can be categorized based on characteristics and/or circumstances of populations which may alter the quality and quantity of the support. As such, the following framework (Stewart, 1989c) has been suggested: (1) demographics (e.g., age, gender, culture, socioeconomic status), (2) transitional stressors (e.g. childbirth, bereavement), (3) situational stressors either acute (e.g. surgery) or chronic (e.g. disability), (4) and health behaviours (e.g. "normal populations"). This framework was used to guide the review of the peer support literature and to promote a parsimonious synthesis; the initial category was integrated into the final three distinctive population classifications.

Transitional stressors. A myriad of empirical work has focused on individuals who have undergone maturational or developmental life transitions. In particular, childbearing women have received considerable attention with the use of peer support to enhance prenatal care with low-income women (Lapierre, Perreault, & Goulet, 1995) and improve perinatal outcomes in teenagers

(Heins, Nance, & Ferguson, 1987), Hispanic migrant farmworkers (Warrick, Wood, Meister, & de Zapien, 1992), and "high-risk" mothers (Snyder, 1988). Integrated into the postpartum period, the augmentation of social networks through general mother-to-mother support groups (Cronenwett, 1980) and telephone interactions (Gosha & Brucker, 1986) has been advocated while specific breastfeeding peer support interventions, incorporating role modeling and educational strategies, have been shown to improve breastfeeding initiation and duration rates with low-income Native American (Long et al., 1995), African-American (Caulfield et al., 1998), and urban (Kistin et al., 1994) women. Peer support has also been employed to facilitate adjustment in women suffering from postnatal depression (Jones, Watts, & Romain, 1995), enhance coping and determine the efficacy of telephone behavioural management counselling with mothers of excessively crying infants (Wolke, Gray, & Meyer, 1994), and improve the mental health of mothers and young children by buffering the effects from families where there is significant psychosocial morbidity (Cox, 1993).

While the use of peer lay helpers has been shown to moderate the effect of major transitions in life in relation to childbirth and the adjustment to parenthood, peer support interventions have also been applied to individuals who have experienced recent significant losses. Community-based organizations have been developed to augment social networks and alleviate social isolation while indirectly reducing the number of visits to physicians (Tudiver, Permaul-Woods, Hilditch, Harmina, & Saini, 1995). For example, an independent charitable organization entitled the "Community Contacts for the Widowed" (Rogers, Vachon, Lyall, Shelfon, & Freeman, 1980) offers individual and group counselling and volunteer work to widows and employs peers called "widow contacts" to establish one-to-one supportive relationships. In contrast, hospital-based interventions, such as group grief therapy, have been suggested to promote coping and surviving strategies in gay men with multiple loss (Maasen, 1998).

Chronic situational stressors. Facilitating adjustment to long-term disabilities or chronic diseases, in both individuals and caregivers, is another specific area where peer support has been

highly advocated (Olsson, Walsh, Toumbourou, & Bower, 1997; Payne, 1995). Within the traditional group setting, peer support has been used with adults managing diabetes mellitus (Powell, 1988), adolescents experiencing chronic renal failure (Gorynski & Knight, 1992), and individuals suffering from head injuries (Schwartzberg, 1993; Schulz, 1993). In addition, specific programs have incorporated one-on-one sessions between peer lay helpers and individuals who suffer from breast cancer (Rinehart, 1994) and the loss of vision (Kleinschmidt, 1996); home visits have also been used with individuals who suffer from long-term mental illness (Bradshaw & Haddock, 1998) and renal disabilities (Roy & Atcherson, 1983). While some peer support services are part of a permanent program, other peer support interventions are time-limited such as the school-based self-management program for youth with chronic health conditions (Magyary & Brandt, 1996) and the promoting of healthy bladder habits program for seniors suffering from urinary incontinence (Newman, Wallace, Blackwood, & Spencer, 1996). Peer lay helpers have also been hired by health care professionals to function as team members. This specific type of peer support has been used in the "Parent Advocate Program" which is part of a pediatric hematology/oncology service (Carpenter et al., 1992) and in the Work Incentives and Needs Study (WINS) where "peer counsellor specialists" help individuals with psychiatric disabilities to prepare for and maintain employment (Mowbray et al., 1996; Mowbray et al., 1994). Transcending traditional health care delivery settings, unique peer support services have been developed to address distinctive needs such as the community-based HIV-related walk-in clinic for gay men (Levinson & Miller, 1992) and the on-line computer-mediated peer support group for women with breast cancer (Weinberg, Schmale, Uken, & Wessel, 1996). In contrast to the client-oriented care, peer support services are also emerging for caregivers as parent-to-parent support programs offer a unique model for personalizing family support services by incorporating veteran parents of children with disabilities (DeNardo, Stebulis, Tucker, & Schaller, 1995; Hartman, Radin, & McConnel, 1992; Santelli, Turnball, & Higgins, 1997).

Acute situational stressors. Although not as targeted as the chronic care setting, health care professionals have also investigated the effect of peer support on acute stressful life events. While Taylor and Bledsoe (1986) examined the effects of peer support, in combination with other treatments, on health outcomes of women experiencing premenstrual syndrome, peer-related support has also been applied to address social problems such as substance abuse and homelessness (Galanter, Dermatis, Egelko, & De Leon, 1998) and the retention in a cocaine aftercare program for recovering women (Coughey, Feighan, Cheney, & Klien, 1998). In addition, Henderson (1995) examined abused women and the effect of both individual and group "peer-provided social support" in a crisis setting.

General health behaviours. Health promotion interventions embody a unique application of peer support. Within this category, peer lay helpers are still integrated into specific programs but their roles are immensely divergent with a heightened emphasis on informational and appraisal support and a diminished accentuation on emotional counselling. While Albrecht and Peters (1997) integrated peer counsellors as case managers to address an extended array of health problems such as substance abuse and gang violence, the majority of peer-related health promotion interventions emphasize a specific health behaviour. Of particular interest is the use of peer lay helpers in AIDS and STD prevention with African American drug-dependent women (Harris, Bausell, Scott, Hetherington, & Kavanagh, 1998), middle school youth (Kirby, Korpi, Adivi, & Weissman, 1997), adolescent females (Guthrie, Wallace, Doerr, Janz, Schottenfeld, & Selig, 1996), and prison inmates (Vaz, Gloyd, & Trindade, 1996). Cancer screening and prevention is another prevalent health promotion intervention that incorporates peer support. Within these community programs, peer lay helpers have been used to increase (1) colorectal cancer screening among socioeconomically disadvantaged elderly individuals (Weinrich, Weinrich, Stromborg, Boyd, & Weiss, 1993), (2) mammography use among women aged 65 and older (Janz et al., 1997), and (3) cancer-screening examinations with Latinos (Navarro, Seen, Kaplan, McNicholas, Campo, & Roppe, 1995). Peer-

related interventions with the adolescent and school age population are also popular; these programs have addressed the development of healthy coping patterns (Carty, 1991), conflict resolution skills (Giuliano, 1994), and injury prevention attitudes (Tenn & Dewis, 1996) and have facilitated comprehensive violence (Kelder, Orpinas, McAlister, Frankowski, Parcel, & Friday, 1996) and drug (Dorsch, 1997; Klepp, Halper, & Perry, 1986) prevention interventions.

Summary of peer support literature. The literature review clearly demonstrated that the provision of peer support can occur through multiple modes of interaction (e.g. individual one-on-one sessions, mutual aid support groups, on-line computer-mediated groups, or within an educational milieu), in diverse settings (e.g. home, hospital, walk-in clinic, community organization, school, prison, or via telephone or computer) through various providers (e.g. community- or hospital-based professional programs or volunteer organizations) and incorporates a variety of roles (e.g. educator, advocate, leader, counsellor, mediator, linking agent, or cultural translator) with varying degrees of involvement (e.g. peer support as the sole intervention or part of a combined program). In addition, peer support can be provided to various groups of individuals, targeting numerous demographic variables (e.g. age, ethnicity, socioeconomic status), and programs may encompass both disease-related and health-related focuses. Even though there are multiple applications of peer support, the provision of peer support itself incorporates specific common attributes.

Defining Attributes

From the review, three critical attributes -- emotional, informational, and appraisal support-- have emerged repeatedly in the provision of peer support. While these attributes appear in combination, each occurs in varying proportions based on the purpose of the program or organization. For example, peer-supported health promotion interventions typically have a strong informational content domain at the outset and later integrates more appraisal and emotional support to reinforce the information, while programs for newly diagnosed cancer clients may provide more emotional support and little informational and appraisal support initially. Despite the various

combinations, all peer support programs provide informational, appraisal, and emotional support to some degree.

Emotional support. In the course of life, individuals encounter threats to their self-esteem such as occurrences that raise doubts about their own ability, social attractiveness, or career performance (Wills, 1985). An interpersonal resource with a strong effect for counteracting self-esteem threats is having someone available with whom one can talk about problems; this supportive function has been termed emotional or esteem support. Since talking about important problems generally involves revealing negative aspects of the self, most individuals tend to confine serious problem discussions to a person they feel particularly close to. As such, studies of social support typically show a large difference in symptomatology between individuals who have no such relationship and individuals who have at least one such close relationship (Wills). The mechanisms through which discussions about problems serve to enhance or restore self-esteem is not known in detail; however, an important element in this resource is the experience of feeling accepted, cared for, admired, liked, empathized, trust, esteemed, respected and valued by another person even though one is having difficulties in other life areas (Cobb, 1976; Cronenwett, 1983; House, 1981; Norbeck, Lindsey, & Carrieri, 1981). There is relatively little evidence on the actual helping behavious that bring about this function, but several studies have suggested that supportive interactions include listening attentively and reflecting on respondents' statements, offering sympathy and reassurance, and avoiding criticism or exhortatory advice-giving (Wills). Through these mechanisms and functions, emotional support can be conceptualized with reference to such theories as self-esteem [e.g. downward comparison theory (Wills, 1981)] and coping (Lazarus & Folkman, 1984).

Informational support. If problems cannot be resolved easily and quickly, individuals usually begin a search for information about the nature of the problem, knowledge about resources relevant to the problem, and guidance about alternative courses of action (Wills, 1985). Informational support

is the term applied to a process through which other persons may: (1) provide knowledge during either a time of stress (House, 1981), (2) bring about a desired social and/or personal change (Katz & Bender, 1976), (3) provide independent assessments of the locus of the problem, and (4) assist in problem-solving through the mechanisms of information, advice, guidance, directives, suggestions, and referrals (Cronenwett, 1983; Wills). Given these preceding functions, informational support can be conceptualized with reference to such theories as social comparison (Festinger, 1954) and help-seeking (Gourask, 1978).

Appraisal support. Many life stressors and problems are not easily resolved, have significant implications for the future, and require persistence and endurance before they are finally overcome. Appraisal support, also referred to as affirmational support, involves the communication of information which is relevant to self-evaluation rather than problem-solving (House, 1981), and encompasses expressions that affirm the appropriateness of acts or statements made by another (Kahn & Antonucci, 1980). Further mechanisms include a motivational aspect such as encouraging individuals to persist in their efforts at problem solution, reassuring them that their efforts will ultimately be successful and that better things will come, helping them to endure frustration, and communicating the belief that 'we can ride it through' (Wills, 1985). These mechanisms as a whole generate positive expectations for the future and can be conceptualized with reference to motivational and personal control theories such as self-efficacy (Bandura, 1977).

Antecedents

Prior to the occurrence of emotional, informational, and appraisal support, specific events or incidents must transpire. Since peer support is applicable to a wide variety of situations, the level of specificity of its antecedents must be relatively low in order to accommodate generalizability. For peer support to occur at least two individuals must be united in a socially-created (Stewart, 1990c), health-related situation and both individuals must be willing to participate in, and possess the ability to receive and respond to, a social interaction involving symbolic, verbal, and nonverbal

communications (Stewart). Peer support is disseminated by lay helpers (Giblin, 1989) who have similar or indigenous qualities (depending on the purpose of the intervention) and possess specific knowledge which is concrete, pragmatic, and present-oriented wisdom, derived from personal experience (Stewart, 1990a); it is these similar characteristics and personal experiential knowledge which enable individuals to be recruited and oriented to become a peer for a specific program or organization. In this socially created network, individuals unite to: (1) satisfy a common need, (2) overcome a similar illness, condition, or life transition, and/or (3) bring about a desired social and/or personal change (Katz & Bender, 1976).

Consequences

The rationale for incorporating peer lay helpers drawn from a targeted population or community is related to the fact that learning and coping occur through the mutual exchange of wisdom (Stewart, 1990a; Borkman, 1976). Individuals assimilate new knowledge and appraisals more effectively when it is presented by peers with whom they identify and share a common experience. As such, peer interventions give credence to personal involvement and experiential knowledge, which in turn facilitates a cathartic and empathetic dimension to the interventions (Stewart). Based on this mutual understanding, there is ample evidence that peer support can enhance positive health outcomes and reduced morbidity. This impact on health may occur through a main or direct effect, a buffering or moderating effect, or a mediator effect (Stewart & Tilden, 1995).

Main or direct effect model. The main effect model posits that peer support directly benefits well-being by fulfilling basic social needs and enhancing social integration (Cohen & Syme, 1985; Stewart & Tilden, 1995). A theoretical example functioning within the main effect model is the Innovation Adoption and Innovation Diffusion Theory (Rogers, 1983; Israel, 1985). Diffusion of innovations tends to occur through communication channels, from an experienced, knowledgeable source to an individual or group having little or no understanding of the innovation; it is most effective through interpersonal channels between peers (Bird, Otero-Sabogal, Ha, & McPhee, 1996;

Doyle, Smith, & Hosakawa, 1989; Rogers). In programs intervening in network depleted, transitionally stressed, or culturally diverse populations, peer lay helpers may provide the ideal communication link. In addition, as a social grouping within a targeted community, peer lay helpers form a mediating structure by directly negotiating between the private lives of individuals and professional health care services (Bird et al.). Therefore, peer lay helpers can directly: (1) disseminate information regarding specific services, (2) established linkages with professional services (referral system), (3) identify and demystify potential and actual barriers to professional services, (4) translate cultural values, (5) reach socially isolated "high-risk" individuals of a target population, and (6) increase the probability of intervention acceptance (Bird et al.; Hill, Bone, & Butz, 1996; Eng & Young, 1992).

Buffering or moderating effect model. The buffering model proposes that peer support protects individuals from potentially harmful influences of acute stressful events (Cohen & Syme, 1985; Stewart & Tilden, 1995). A theoretical example functioning within the buffering effect model is Coping Theory (Lazarus & Folkman, 1984). Coping involves the changing cognitive and behavioural efforts to manage specific external environmental and/or internal demands that are appraised as taxing or exceeding the resources of the individual. Lazarus and Folkman's research on the coping process reveals that its dual goal of problem-resolution and emotion-regulation bring into play the individual's cognitive, affective, and behavioural response systems. Chronologically, the cognitive system is the first to be engaged when the individual is exposed to a stressor. Here, the individual attempts to discern the significance of the stressor for their well-being, interpreting it in one of four ways: as a threat, as a source of harm, as a loss, or more benignly, as a challenge. This primary appraisal process precedes the process of secondary appraisal in which the individual assesses the coping resources, both personal and environmental, at their disposal. Here, peer support has a major role to play since the availability of a peer lay helper will add to the individual's confidence in their ability to master the demands of the stressor. But peer support's influence on the

primary appraisal process can be more subtle, entailing not only direct responses such as the provision of information about the nature of the stressor and active efforts to remove or soften it, but also indirect responses involving social comparison. That is, in comparing their own emotional responses to their peer's, the individual's confidence in their ability to overcome the threat will either be augmented or diminished depending on how the reference group reacts. If the peer lay helper reacts calmly, it increases the chance that the stressor will be interpreted more benignly, while if the peer shows signs of arousal it is likely that the stressor will be subjectively interpreted as more threatening. As such, peer lay helpers can: (1) broaden the number of coping resources, (2) discuss coping strategies, problem-solving techniques, and counter-responses thereby moderating the initial appraisals of the stressor, (3) provide norms through social comparison which prescribe adaptive behaviour, (4) redefine and reduce the potential for harm posed by the stressor, and (5) counteract the propensity to blame oneself for causing the stressor or adversity thus preventing active coping efforts to be hampered by self-recriminations (Cohen & Syme; Gottlieb, 1985; House, 1981; Thoits).

Mediator effect model. The mediator model predicts that peer support acts as an intervening variable indirectly influencing the effects of stress (Stewart & Tilden, 1995). A theoretical example functioning within the mediator effect model is Social Learning Theory (Bandura, 1977, 1986). Through the synthesizing of cognitive, behavioural, emotional, and environmental explanations of learning and behavioural changes, social learning theory (Bandura, 1977) postulates that personal and situational influences alter coping behaviour and transactions with the social environment. Since individuals' perceptions of their capabilities affect their behaviour, thinking, and emotional reactions in stressful situations, peer lay helpers influence an individual's choice, effort, and persistence in engaging in a specific behaviour.

In choosing, performing, and maintaining a behaviour, individuals weigh four sources of information: (1) performance accomplishments, (2) vicarious experiences, (3) verbal persuasion, and (4) inferences made from one's physiologic and/or affective state (Bandura, 1977). Personal

experiences are often the most immediate and powerful source of efficacy information since successful performances increase self-efficacy, whereas repeated failures diminish it (Bandura, 1986). However, perceived self-efficacy is not based solely on the outcome of the performance but also on conditional factors such as the intricacy of the task, the effort expended, the amount of assistance required or received, and various circumstances that may facilitate or impair a specific performance (Bandura). The effect of actual experience on self-efficacy is modified by individuals' interpretations of their performance and the desired outcome. Attention to successful or improved aspects of performance or outcomes tends to boost perceptions of self-efficacy, whereas observance to unsuccessful aspects of the performance and the outcomes tends to lower perceptions of self-efficacy (Bandura).

However, the impact of observational learning is contingent on the attributes of the role models, as well as the manner in which the demonstrations are performed. The most effective role models are demographically and psychosocially similar to the target audience yet more competent at the behaviour being modeled (Perry & Furukawa, 1986). As such, individuals can assimilate new knowledge better when it is presented by peers, or within a peer context, since they can identify with someone who shares a common experience (Stewart, 1990a). Hence, role models exercise considerable control over health behaviour, because individuals partly judge their capacities through comparison with other. This vicariously derived information from models can alter perceived self-efficacy not only through social comparison, but also through teaching effective coping strategies and conveying information about the control ability and predictability of environmental tasks.

Furthermore, individuals often accept the appraisals of others as valid assessments of their own abilities and this can impact the level of self-efficacy (Bandura, 1986). By directing attention to the successful aspects of a behaviour and praising new and existing skills, an individual's self-efficacy is bolstered. The more credible the individual providing verbal persuasion, the greater the potential to affect perceptions of self-efficacy. Finally, individuals make inferences about their

abilities from emotional arousal and other physiologic cues experienced while enacting a behaviour or anticipating its enactment (Bandura, 1986). Positive interpretations of arousal, such as excitement or satisfaction, enhance self-efficacy while negative interpretations like pain, fatigue, anxiety, or stress, reduce one's sense of self-efficacy.

In summary, self-efficacy can be increased by social network members, especially peers, through vicarious and enacted modeling, verbal persuasion, and social comparison. Through enhanced confidence, individuals are more likely to believe in one's capabilities, and thus, are more able to perform specific targeted behaviours. Increased self-efficacy also promotes coping abilities, adjustments to stress, and cognitive restructuring. As such, peer lay helpers can enhance an individual's assimilation of new knowledge, coping abilities, emotional adjustment, self-esteem, and psychological well-being (Stewart, 1989d; 1990a; 1990c).

Negative outcomes. Theoretical developments of peer support have traditionally over-emphasized the positive dimensions, assigning secondary attention to the negative aspects. While the absence of social ties, or social isolation, may be a stressor in itself, producing chronic loneliness, lack of identity, or lack of behavioural regulation (Rook, 1990), social network members are not always or even necessarily positive influences in individuals' lives (Rook, 1991). For example, Rook (1984) found that social relaionships may be more important than the support itself and that negative relationships may have a stronger effect on well-being than positive support relationships. Conflict, criticism, failed support attempts, emotional over-involvement (particularly for women) resulting in contagion stress (Marshal, Barnett, Baruch, & Pleck, 1990), reinforcement of poor health behaviours, diminished feelings of self-efficacy (Stewart & Tilden, 1995), lack of stability, and "shadow work" in which an informal, parallel economy supports the formal, market-based economy (Illich, 1981) are just a few examples of the potential negative consequences of peer support. While peer lay helpers may be trying to be helpful they may "provide sometimes clumsy or detrimental support and cause further stress by making demands, by violating privacy, etc." (Rook & Dooley,

1985, p.12). The peer lay helpers may be doing their best but may not know what is needed or have the experience or ability to provide the support required to produce a positive outcome (Hupcey, 1998).

Support that is not reciprocated also may be a negative outcome (Rook, 1987). Two types of non-reciprocal support may exist: (1) if an individual perceives that they are providing more support than they are receiving or (2) if an individual is receiving more support than they are providing. This latter type of non-reciprocal support can potentially lead to individuals not asking for and or accepting support that is offered, cause stress by making recipients feel inadequate, or result in support being perceived as negative (Hupcey, 1998).

An additional negative outcome may be that while peer support is a potentially cost-effective intervention, it is also easy to exploit or burden through the inappropriate use of peer lay helpers as replacements for professional services. In selecting an individual representative of a targeted population, one may be choosing a person who shares many of the client's problems and issues, thus hampering the performance of the project's tasks and goals.

Pragmatic issues are also of concern as some lay helpers have the reported problems of poor work habits including not following through on assignments, not telephoning when required, and providing short notice of vacations or resignations (Giblin ,1989). However, one must not select lay helpers based on middle-class work ethics which may be compatible with meeting program objectives but antagonistic to their indigenous qualities and undermine the very strengths of the lay helpers (Israel, 1985). Furthermore, problems in implementing and sustaining these programs exist including a lack of clarity in lay helper roles and training for these roles, difficulties of lay helpers working with health care professionals and being accepted by their clients, restriction of their responsibilities to menial tasks and no active involvement in determining program goals and objectives, a lack of planned evaluations, and an absence of sustained funding for these positions (Giblin; Israel).

In summary, despite considerable theorizing about how peer support works to promote health (Berkman, 1985; Pearlin, 1985; Thoits, 1986), studies are still lacking which directly examine presumed intervening mechanisms (Thoits, 1995). However, it has been argued with respect to *psychological* health, that peer lay helpers are a coping resource with the ability to: (1) promote appropriate coping strategies (e.g. by helping to reinterpret situational demands), (2) bolster self-esteem or sense of identity through reassurances, and (3) sustain a sense of mastery or competence through feedback and encouragement (Thoits). The mechanisms through which peer support can influence a target individual's *physical* health may be even more elaborate (Berkman, 1985; Kaplan & Toshima, 1990). Peer lay helpers may: (1) reinforce individual's positive health behaviours through role modeling, (2) actively monitor and regulate a targeted health-related behaviour, (3) provide vicarious experiences, observational learning, and verbal persuasion, (4) encourage help seeking, (5) enable social comparison, (6) provide appropriate interpretations of situations due to experiential knowledge, and (7) enhance self-efficacy, thus, encouraging the choice, performance, and maintenance of target behaviours. While promoting the positive effects of peer support, attention must also be yielded to the latent negative outcomes.

Summary of Peer Support Concept Analysis

A concept analysis has been conducted to promote a clear and concise understanding of peer support and to distinguish it from related concepts (the latter are described in Appendix B). This concept refinement aided in the measurement and implementation of a peer-related clinical support intervention. The rudimentary linguistic definition of peer support is close to the actual definition which is emotional concern, appraisal, and informational assistance, perceived by a potentially or actually stressed focal person to be provided by a lay member of their created social network in their social environment to address a health-related issue. The defining attributes include emotional, informational, and appraisal support with the antecedents being a socially-created, health-related interaction involving an indigenous lay helper/self-help group where experiential knowledge

promotes coping in a potentially or actually stressed individual. Peer support has many theoretical foundations including social comparison theory, social learning theory, innovation adoption and innovation diffusion theory, and coping theory. These theories help explain the mechanisms underpinning peer support and the positive health consequences.

Summary of Literature Review

Breast milk has been recognized as the best form of infant feeding for both infants and mothers. With the aid of international and national documents, the majority of Canadian mothers initiate breastfeeding today; however, rates decline rapidly over the first initial months with less than 30% of mothers continuing any form of breastfeeding until the recommended 6 months postpartum. As such, factors related to breastfeeding initiation and duration have been extensively studied. From this research, specific maternal demographic characteristics, attitudes, intentions, intrapersonal beliefs, hospital policies, and sources of support have all been examined in relation to the initiation and continuation of breastfeeding.

Studies indicate that many new mothers need and desire quality support to help them to continue to breastfeed. As such, interventions designed to specifically increase breastfeeding duration have been developed by health care professionals. However, a meta-analysis of 13 trials, 12 of which were of professional support, has indicated that no significant improvements in breastfeeding outcomes continued beyond 2 months postpartum. The inability of health care professionals alone to meet the health needs of contemporary society has been recognized by both researchers and consumers as health care trends promote a greater reliance on lay support. This assistance rendered by lay individuals rather than professionals is termed social support which has been associated with positive impacts on health, health behaviours, and health service utilization. To develop an enhanced understanding of social support, structural, functional, and interactional aspects of the concept have been described. However, it has only recently been acknowledged that not all

social support interactions are positive as negative consequences are also possible. To address some of these negative consequences, created social networks, such as peer lay helpers, have been advocated due to their similarities with target populations and their experiential knowledge. Embedded within the social support construct, this assistance provided by peer lay helpers is termed peer support. Through a concept analysis, a definition of peer support has been delineated and specific mechanisms underpinning peer interventions have been described. This conceptual activity aided in the measurement and implementation of a dyadic level, clinical support intervention to evaluate the effectiveness of peer support on breastfeeding duration among primiparous women.

CONCEPTUAL FRAMEWORK

The conceptual framework for the trial was based on the preceding literature review and Stewart's (1990c) "From Provider to Partner" conceptual framework, which provided a general foundation for the conceptualization and organization of several concepts. A brief description of a larger breastfeeding support framework, that provided the background for the trial, will be presented followed by the specific breastfeeding peer support model that guided the intervention.

Breastfeeding Support Conceptual Framework

Overview

Within the larger framework of breastfeeding support, five primary concepts (mother, peer volunteer, professional, environment, and health) and nine related ideas (collaboration, experiential knowledge, professional knowledge, self-care, mutual aid, healthy environment, primary health care, peer support, and professional support) reflect the philosophy of partnership between breastfeeding mothers, peer volunteers, and health care professionals (see Table 3 for definitions of these concepts and related ideas). While social-psychological and physical environments are equally important, this conceptual framework places a heightened emphasis on the social dimension of health; a primary underlying premise is the ability of professionals and peer volunteers to have direct, mediating, and moderating effects on physical and psychological health.

Brief Description of the Breastfeeding Support Framework

The succeeding description will synthesize, organize, and interpret the main concepts to give meaning to the breastfeeding support conceptual framework (Figure 2). A community comprises of both *informal and formal health care sectors*, each which provides a unique form of support to a new breastfeeding mother and her social network. Within the informal sector, *peer volunteers*, who possess *experiential knowledge* regarding the breastfeeding process, provide *peer support* where as within the

Table 3
Definitions of Relevant Conceptual Framework Concepts

Peer Volunteer	A peer volunteer is a mother (lay helper) with previous breastfeeding experience who is a member of a community volunteer breastfeeding program. Through this program, the peer volunteer is matched with a new mother based on similarities, such as residency, age, socioeconomic status, and/or ethnicity. Her aim is to assist the new mother in reaching her breastfeeding goals and to obtain optimal health.
Professional	A professional is a trained individual in the health care arena with the goal of assisting in the initiation and continuation of breastfeeding and the obtainment of optimal health within the mother/infant dyad.
Environment	The environment is the context of the peer volunteer's and health care professional's beneficiaries and services. It is social-psychological (consisting of embedded and created social networks and professionals which can be sources of support or stress), politic-economical (including social movements such as the mutual-aid, self-care, and lay helper movements), and physical (encompassing both institutional and diverse community settings) (Stewart, 1990c).
Health	Health is a proportional composite of the social, psychological, physical, and cultural well-being of individuals, families, and communities (Stewart, 1990c). Through, direct (main), moderating (buffering), and mediating effects, health care professionals and peer volunteers can promote and protect the new mother's and infant's health and the continuation of breastfeeding.
Peer Support	Peer support is emotional concern, feedback, and informational assistance, perceived by the mother to be provided by members of her created social network (e.g. peer volunteers) in her social environment which may result in connections. Peer support is operationalized, either by the perception or enactment , by peer volunteer interactions which refers to the symbolic, verbal, and nonverbal communications or mutual interchange that occurs in relationships between mothers and peer volunteers in their environment. This interchange may incorporate empathy and trust (Jordan, Kaplan, Miller, Stiver, & Surrey, 1991) and may involve one or more of the following roles: consultant, liaison, educator, advocate, and role-model.
Professional Support	Professional support is emotional concern, feedback, and material and informational assistance, perceived by the mother to be provided by health care professionals. Professional support is operationalized by professional-mother interactions which refers to the symbolic, verbal, and non-verbal communication or interchange occurring in their relationships and involves negotiation and consensus regarding breastfeeding and health goals (Stewart, 1990c). The professional equally encompasses consultant, liaison, educator, advocate, and care-provider roles. The utilization of professional support is influenced by the mother's social network, her peer volunteer, and the mother's own help seeking behaviours.
Experiential Knowledge	Experiential knowledge is 1) concrete, pragmatic, and present-oriented wisdom; 2) derived from personal experience; 3) developed by individuals regarding breastfeeding and health matters; and 4) disseminated and validated within created social networks in the environment through role-modeling, verbal persuasion, and social comparison (Stewart, 1990c).
Professional Knowledge	Professional knowledge, transmitted initially through formal undergraduate and continuing education and informal learning, encompasses unique and shared information, skills, and values. It entails explicit adaptive responses and sound creative judgment when confronting new or complex situations and leads to professional competence (Stewart, 1990c).
Self-Care	Self-care involves the decisions taken and practices adopted by the mother to promote maximum health and functioning within her environment which can be taught or reinforced through collaborations with the peer volunteer and health care professionals (Epp, 1986, Stewart, 1990c).
Mutual Aid	Mutual aid is the effort made by the mother, peer volunteer, and health care professionals working together to address the mother's health concerns and to promote the continuation of breastfeeding (Epp, 1986).
Healthy Environment	The altering or adapting of the social, economic, or physical surrounding in order to help preserve and enhance maximum health and the continuation of breastfeeding. This means ensuring that diverse resources are available to meet the mother's breastfeeding requirements through the collaboration of professionals, peer volunteers, and other community members (Epp, 1986).
Collaboration	Collaboration refers to a collegial interweaving among professionals, peer volunteers, and the mother characterized by resource exchange and complementary activities directed toward the attainment of maximum health and the continuation of breastfeeding (Stewart, 1990c).
Primary Health Care	Primary health care is a strategy to promote individual and community involvement and intersectoral collaboration in health care (Sukati, 1995, WHO, 1978). The components of primary health care -- self-care, mutual aid, public participation, creation of supportive environments, teamwork with lay helpers, and community-based care (Stewart, 1990c) -- are combined to create a synergized community. Synergy is a pattern by which phenomena relate to each other and where human activities and intentions, such as helping and healing, are intrinsically expanding and renewable and need not be viewed as scarce (Katz, 1984).

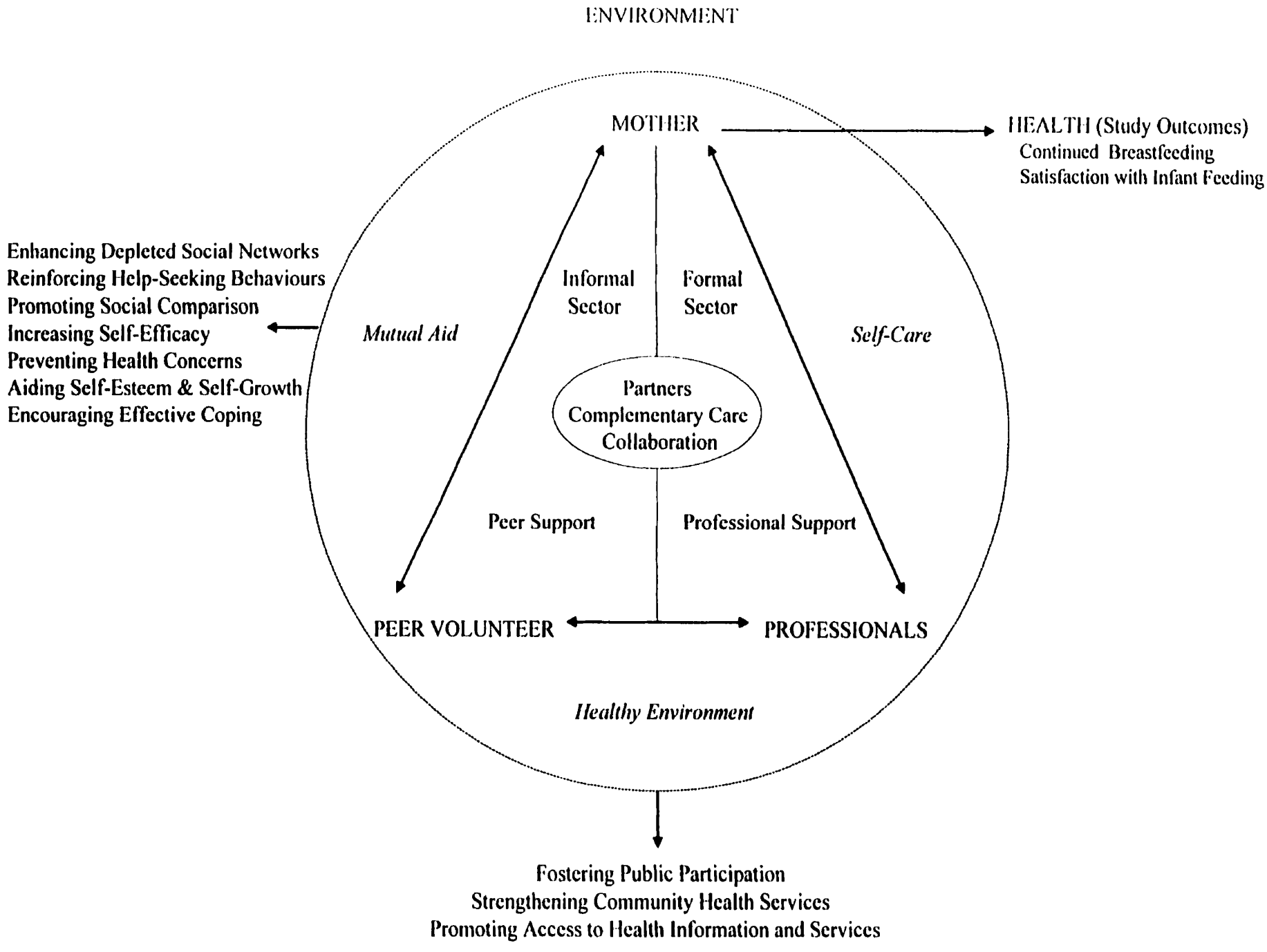


Figure 2. Conceptual model of breastfeeding support

formal sector, nurses/lactation consultants/physicians, who possess *professional knowledge*, provide *professional support*. Reciprocal exchange of information promotes *partnership* and *collaboration*. Joint assumption of partner roles by the professional and peer volunteer facilitates *primary health care* mechanisms such as *mutual aid*, *self-care*, and *healthy environment*. This *complementation* of services by the informal and formal health care sectors fosters *public participation*, *strengthens community health services*, and *promotes access to care* for individuals that health care professionals may have traditionally had difficulty reaching. Through these preceding processes, an *environment* is created that is conducive to the mother's optimal *health* and the continuation of breastfeeding.

This larger conceptual model provides an overall picture of the breastfeeding support phenomenon. However, only part of this framework was evaluated in this study-- the effect of peer support on breastfeeding duration among new mothers-- and a specific breastfeeding peer support model was developed to guided the intervention.

Breastfeeding Peer Support Model

Figure 3 is a diagrammatic representation of the Breastfeeding Peer Support Model upon which the study was based.

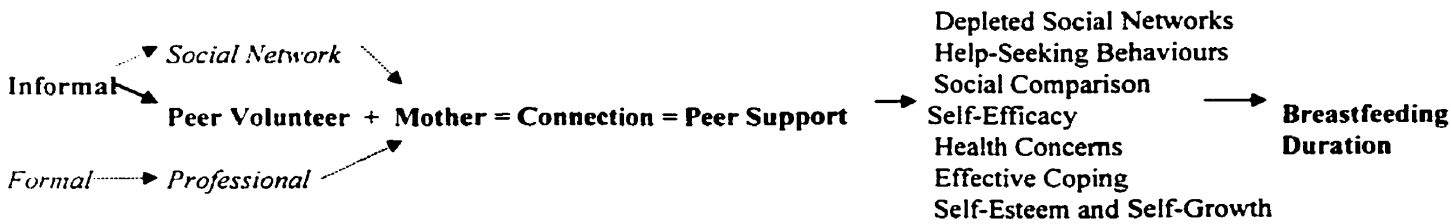


Figure 3. Conceptual model of breastfeeding peer support

Through enrollment in a community volunteer breastfeeding program, the new mother, hoping to breastfeed her infant, is linked with a peer volunteer, who is a mother experienced at breastfeeding. The peer volunteer and mother enter a relationship and may develop a connection

based on empathy and trust. Through this relationship the peer volunteer renders assistance, within the informal health care sector, to enable the mother to achieve her breastfeeding goals. This lay assistance, which may incorporate a variety of roles, can increase physical, psychological, and social health and promote positive breastfeeding behaviours. Specifically, the peer volunteer can enhance depleted social networks, promote social comparison, increase self-efficacy, encourage effective coping, and prevent health concerns through the provision of role modeling (vicarious experience), verbal persuasion, and social comparison. Furthermore, this connection can be bi-directional, if reciprocity is present, and both the peer volunteer and mother can experience increased self-esteem and self-growth through mutual learning and empathy. If professional support is required, the peer volunteer can be a mediating link between the mother in the community and the professional health services. The peer volunteer can collaborate as a partner with not only the new mother and her actual or potential informal social network, but also with health care professionals. Thus, the peer volunteer can enhance help-seeking behaviours. Through these functions, the peer volunteer aids the mother to continue to breastfeed and achieve her goals, thus increasing her satisfaction with how she feeds her infant. To test this model, a trial was designed with the following objectives and research questions.

RESEARCH OBJECTIVES

The objectives of this study were:

1. to ascertain differences between primiparous women who received peer support and primiparous women who did not in relation to: breastfeeding duration, maternal satisfaction with infant feeding, breastfeeding problems and concerns encountered, and the utilization of health services and other supports;
2. to describe women's perceptions of peer support received; and
3. to describe the nature and intensity of peer support in a community breastfeeding program.

RESEARCH QUESTIONS

Primary Research Question

What is the effect of peer support on breastfeeding duration among primiparous women?

Secondary Research Question

What is the effect of peer support on maternal satisfaction with infant feeding among primiparous women?

Other Research Questions

1. What are the effects of peer support on:

   a) the rate of breastfeeding problems and concerns reported?

   b) mothers' and infants' use of health services and other supports?

2. What are the mothers' perceptions of peer support?

3. What is the nature and intensity of peer support provided to mothers in the experimental group?

ASSUMPTIONS

The study was based on the following assumptions:

1. Most women are able to lactate;

2. Breastfeeding behaviour can be measured; and

3. Trial participants will be truthful in their responses to data collection forms, questionnaires, and activity logs.

CHAPTER II

METHODS

Study Design

Overview

To determine the effect of peer support on breastfeeding duration among primiparous women, a randomized controlled trial was conducted (see Figure 4). In this trial, eligible and consenting new mothers were randomly allocated to either a peer support group or a conventional support group. Women allocated to the peer support group (n = 132) were matched to a peer volunteer (a mother experienced with breastfeeding who volunteered to participate in a regional community breastfeeding program) based on residency. The peer volunteer telephoned the new mother within approximately 48 hours of hospital discharge, and then as frequently as deemed necessary by the participant. Women allocated to the conventional support group (n = 124) did not receive the peer support intervention but

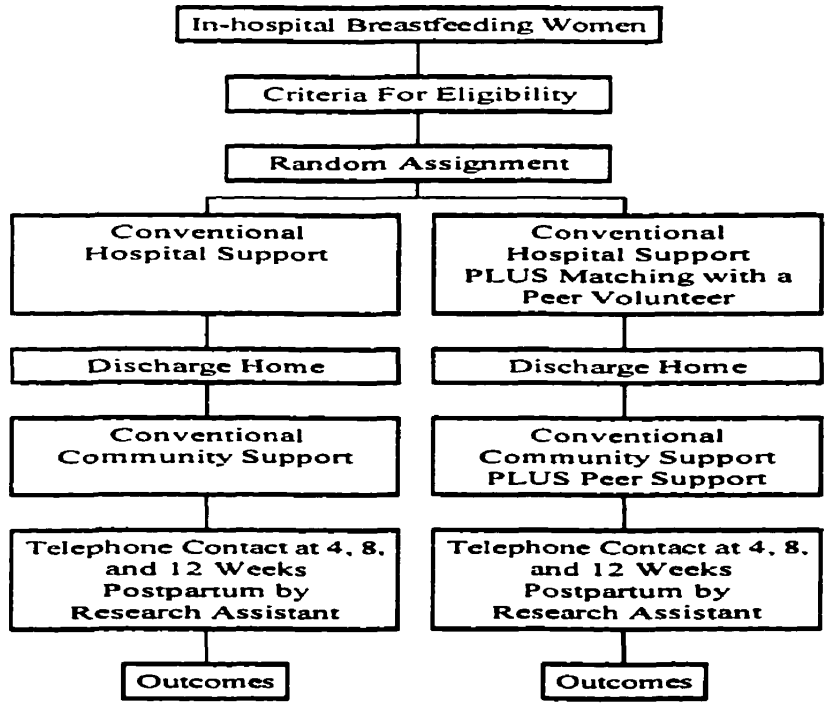


Figure 4. Schema of study design

did have access to the usual in-hospital and community postpartum support services. A blinded research assistant telephoned all study participants at 4, 8, and 12 weeks postpartum to determine infant feeding method, breastfeeding problems and concerns encountered, and health services utilized. At the end of the 12 week follow-up, all participants evaluated their satisfaction with their infant feeding experience, revealed additional information regarding their postpartum activities, and the experimental group reported their perceptions of the peer support experience.

In this chapter, the specific outcome measures, sample, and setting will be outlined proceeded by a discussion of the trial manoeuvers which includes following: (1) pre-trial procedures (e.g. recruitment of the peer volunteers), (2) operations prior to randomization (e.g. the recruitment process), (3) specification of control and peer groups activities, (4) methods used to control contamination between the groups, and (5) actions with non-randomized eligible women. Following this discussion, the nature and intensity of the peer support intervention will be outlined to delineate the specific peer volunteers' activities. Finally, the data collection questionnaires, data management process, data analysis procedures, and ethical considerations will be described.

Definitions of Outcome Variables

Breastfeeding Duration

The primary outcome for this trial was any breastfeeding, determined at 3 months, defined as receiving any breast milk within the last 24 hours. This outcome was measured in question two in Part I of the Breastfeeding Assessment Questionnaire (Appendix C). Infant feeding was further classified into one of the six categories every 4 weeks (see Table 4).

Maternal Satisfaction with Infant Feeding

Maternal satisfaction with infant feeding was defined as whether the mother was pleased or not with how she actually fed her infant. This variable was measured in the Maternal Satisfaction with Infant Feeding Questionnaire (Appendix D).

Table 4

Definitions of Infant Feeding Categories (Labbok & Krasovec, 1990)

Category of Infant Feeding	Requires that the Infant Receive	Allows the Infant to Receive	Does Not Allow the Infant to Receive
Exclusive Breastfeeding	Breast milk (including milk expressed)	Vitamins, minerals, medicines	Anything else
Almost Exclusive Breastfeeding	Breast milk as the predominant source of infant nourishment	< 1 bottle/week of non-human milk, water, water-based drinks, fruit juice, ORS, ritual fluids,	Anything else
High Breastfeeding	Breast milk as the predominant source of infant nourishment	> 1 bottle/week of non-human milk or any food or liquid	1 bottle/day of non-human milk
Partial Breastfeeding	Breast milk and any food or liquid	1 bottle/day of non-human milk or any food or liquid	
Token Breastfeeding	Non-human milk or any food or liquid as the predominant source of infant nourishment	Breast is used for comfort or to console the infant with minimal nutritional contribution	
Bottlefeeding	Any non-human food or liquid		Breast milk

Breastfeeding Problems and Concerns

Breastfeeding problems and concerns were defined as actual difficulties or questions a mother experienced while breastfeeding (e.g. cracked nipples, engorged breast, maternal fatigue, perceived inadequate milk supply, nutrition, milk expression); the variable was measured in Part III of the Breastfeeding Assessment Questionnaire (Appendix C).

Health Services and Other Support Utilization

This variable was defined as both formal/professional health services (e.g. hospital telephone line, breastfeeding clinic, public health department, lactation consultant, pediatrician, or family physician) and informal/lay support (e.g. partner, family members, friends, La Leche League, or peer volunteer) used by a mother to aid her with her breastfeeding problems or concerns; the variable was measured in Part IV of the Breastfeeding Assessment Questionnaire (Appendix C).

Perception of Peer Support

Perception of peer support is defined as a mother's evaluation of the support she received from her peer volunteer and was measured in the Perception of Peer Support Questionnaire (Appendix E).

Peer Volunteer Activities

All peer volunteer interactions, including connections and attempts, with a new breastfeeding mother were documented by the peer volunteer on the Peer Volunteer Activity Log (Appendix F).

Sample

Inclusion Criteria

The target population consisted of all in-hospital breastfeeding women who met the following criteria:

1. Ability to read or understand English;
2. Primiparous;
3. Age $\geq$ 16 years;
4. Singleton birth;
5. Gestational age at delivery $\geq$ 37 weeks;
6. Planned to take infant home and breastfeed; and
7. Resided in the participating geographic region and surrounding area accessible by local phone call.

Exclusion Criteria

The exclusion criteria for the trial were as follows:

1. Infant congenital abnormalities that could interfere with breastfeeding, such as cleft lip, cleft palate, or Downs Syndrome;
2. Major maternal illness that could interfere with breastfeeding, such as psychiatric disorders or other conditions identified by hospital staff;
3. Infant in the Level II nursery and unlikely to be discharged home with mother; and
4. Mother enrolled in the community breastfeeding peer support program prenatally.

Sample Size

The required sample size was based on the ability to detect a 20% increase in the number of women breastfeeding at 12 weeks postpartum. In the participating region in 1994, the breastfeeding rate at 12 weeks postpartum was 60% of those who initiated breastfeeding at delivery. Thus, the sample size was calculated to find an increase from 60% to 80% in the number of women breastfeeding at 12 weeks. Since this large effect size increases the likelihood of a Type II error, a 90% power was chosen to decrease this risk. In addition, this is one of the first randomized controlled trials evaluating breastfeeding peer support. Therefore, it was unknown whether this intervention would result in greater harm to the breastfeeding mother than conventional support. As such, a 2-tailed α error was used. Thus, with 90% power and a 2-tailed α error of .05, to find an increase in any breastfeeding at 3 months, from 60% to 80%, and incorporating a possible 5% loss to follow-up, a sample size of 252 (126 per group) was required for this trial.

Sampling

The trial incorporated a nonprobability sampling method. While the sample was not randomly selected, participants were randomly assigned to either the peer or the conventional support group. This random group assignment was achieved using consecutively numbered, sealed, opaque envelopes constructed by the research unit's biostatistician; he was not involved in the recruitment process. Random allocation was performed by the researcher after participant eligibility was reviewed, informed consent was obtained, and demographic data were collected from the participant. Once the preceding procedures were completed, and without leaving the participant, the randomization envelope was opened by the researcher with the participant present and the contents visually revealed to all individuals involved. To ensure an audit trail was available, the envelope number was recorded with the participant's medical record information and on a master information sheet that included the participant's name, telephone number, group assignment, and trial enrollment date. No violations to these procedures occurred.

Setting

To help provide a framework for the peer support intervention, a regional breastfeeding organization was invited to participate as a community partner in the trial. This volunteer community group was established in 1993, in conjunction with the regional health department, to provide mother-to-mother telephone support to new breastfeeding women. At the time, over 200 experienced mothers had volunteered to provide support to over 1000 new mothers. To remain as congruent as possible to the functioning of the community breastfeeding program, the trial was conducted in the same geographic region as the program. As such, participants were recruited from the region's postpartum unit of Hospital A. This community institution is one of four hospitals in the region with approximately 1,600 deliveries per year. However, after reviewing the initial 3 months of recruitment, it was found that approximately 30%, not the estimated 15%, of potential participants did not meet the selection criteria of residing in the region, and thus the recruitment rate was slower than expected. To increase recruitment, the residency selection criteria were broadened to the region and surrounding area and Hospital B, another community institution in the region, which has approximately 1,700 deliveries per year, was added as a recruitment site. Both hospitals have a Level II nursery and the postpartum units were staffed by registered nurses and registered practical nurses with a team leader to organize daily unit functions. Certified lactation consultants were available to aid staff with breastfeeding problems and to manage the hospitals' breastfeeding clinics.

Manoeuvre

Procedures Prior to the Initiation of the Trial

While the community breastfeeding program was used to guide the peer support intervention, two minor changes were made to permit a controlled evaluation. The modifications involved (1) timing of the enrollment into the community breastfeeding program and (2) the recruitment of new peer volunteers.

Timing of enrollment. Discussions with the community breastfeeding program board members revealed that only approximately 10 new mothers per month were enrolled into the program. The major reason for this low number appeared to be timing; women were only invited to participate in the program while they were attending prenatal classes. To increase participation in the program, and to permit a controlled evaluation of it, the trial linked this community program with the local hospitals in order to recruit new mothers in the postpartum period.

Recruitment of peer volunteers. The community breastfeeding program peer volunteer criteria included: successful previous breastfeeding experience, positive breastfeeding attitude, and completion of a two and one half hour orientation session (Appendix G). The focus of the orientation session was to develop peer volunteer skills which would enable them to effectively support new mothers via telephone; role playing and strategizing were important components of the orientation session. The development of specific breastfeeding knowledge was not targeted since all mothers had a previously successful breastfeeding experience; however, a 43-page handbook was distributed to all volunteers to use as a reference guide if additional information was required (Appendix H). While approximately 200 women had completed the peer volunteer orientation session and 100 women were on the active roster, to increase the standardization of the intervention and at the request of the community board members, new peer volunteers were recruited specifically for the trial based on the preexisting criteria. Two months prior to initiating participant recruitment, 250 flyers were distributed by the researcher throughout the region to enlist new peer volunteers (Appendix I). Six orientation sessions were conducted, with two occurring prior to the initiation of the trial; 58 experienced mothers volunteered to participate in the study and at the end of the trial 40 mothers continued to participate as peer volunteers. During these orientation sessions, the trial was introduced by the researcher and all volunteers who wanted to participate in the study were: (1) assigned a volunteer code number to promote confidentiality, (2) requested to complete a

demographic form (Appendix J), and (3) given several peer volunteer activity logs which included postage-paid, addressed envelopes (Appendix F).

The majority of the 58 volunteer peers who participated in the trial were born in Canada (77.6%) and had postsecondary education (89.6%) (Appendix K). Half of the peer volunteers were multiparous (51.7%) and 46.5% were employed, either full-time or part-time, outside of the home. Most of the women (81%) decided to become a peer volunteer because they themselves had had a positive breastfeeding experience and wanted to help new mothers to have a similar experience. All peer volunteers had at least 6 months breastfeeding experience.

In addition to the recruitment of peer volunteers, a community breastfeeding program board member, who was also a current peer volunteer, offered to be the volunteer coordinator for the trial. The coordinator responsibilities included conducting the peer volunteer orientation sessions and matching trial participants with the appropriate peer volunteers.

Procedures Prior to Randomization

All new mothers on the postpartum units intending to breastfeed were reviewed for selection criteria by the researcher and, if eligible, a copy of the Introduction to Prospective Participants Form (Appendix L) was given to the team leader or staff nurse to introduce the study to the potential participant. A verbal contract between the team leader/nurse and the new mother gave the researcher permission to contact the prospective participant to fully explain the nature of the study (Appendix M) and to invite participation in the trial. If the mother agreed to participate, a written consent form was completed (Appendix N), demographic information collected (Appendix O), and medical record data obtained (Appendix P) by the researcher.

Conventional Support Group

Women allocated to the conventional support group had access to all in-hospital and community postpartum support services but did not receive the peer support intervention. In-hospital support services included: (1) registered nurses, (2) medical staff, (3) a lactation consultant, and (4) a

breastfeeding clinic. Community postpartum support services included: (1) a telephone breastfeeding support line managed by hospital nursing staff, (2) the regional health department programs including home visits (if they met specific requirements) and postpartum support groups, (3) breastfeeding clinics in the region, (4) family physicians, (5) pediatricians, (6) community lactation consultants, (7) La Leche League, and (8) the mother's own support network. All breastfeeding services were free of charge except for the community lactation consultants.

Peer Support Group

Women allocated to the peer support group had access to all of the above in-hospital and community postpartum support services in addition to receiving telephone support from a peer volunteer. The mothers' names and telephone numbers were given to the volunteer coordinator by the researcher. The volunteer coordinator then matched each woman with a trial peer volunteer based on residency and availability. The name, telephone number, and expected hospital discharge date of the new mother was given to the peer volunteer the day of trial enrollment. Sixty-seven percent of peer volunteers initiated contact within 48 hours of hospital discharge and 97% of mothers were contacted within the first week. Peer support was provided for as long as the new mother wished. At three months postpartum, all participants were telephoned by the research assistant to determine their perceptions of peer support (Appendix E). The blinded research assistant learned of the mother's groups allocation only after all other data was collected and by opening a sealed, opaque envelop with the mother's first name and code number inscribed.

Both Groups

The care of the mothers and infants in the hospital was according to the standard nursing and medical practice. There were no specific tests or procedures required for those enrolled in the trial. Every four weeks, for three months, the research assistant telephoned all participants to determine their infant feeding method, the breastfeeding problems and concerns encountered, and the health services used (Appendix C). At 3 months postpartum, the research assistant telephoned all study

participants to determine their satisfaction with their infant feeding experience (Appendix D) and to obtain additional information about the participants (Appendix Q).

Contamination

New mothers were free to choose either conventional support or peer support if they had a preference for either form of care. Thus, only women without strong preferences were included in the trial. Mothers who had enrolled prenatally in the regional breastfeeding program were not eligible to participate. With detailed informed consent prior to participation, women accepted their group allocation following randomization. In addition, hospital staff were not informed of mothers' group allocation and all the specific community breastfeeding program advertising material (community program that participated in this trial) was removed from the units. To ensure that contamination did not occur at the community level, the name of any new mother who initiated contact with the community breastfeeding program during the postpartum period was reviewed with the researcher to ensure that the new mother was not enrolled in the trial. To insure that participants received peer support, the volunteer coordinator gave the researcher the peer volunteer's volunteer code for every participant allocated to the peer support group. In the end, only one contamination between the groups occurred. The contamination happened when a mother forgot that she had enrolled in the community breastfeeding program prenatally and she was randomized to the control group. Awareness of this contamination occurred when the participant responded in the Breastfeeding Assessment Questionnaire that she received help from a peer volunteer. The mother remained in the allocated control group for all data analysis.

Non-Randomized Women

Although non-randomized mothers differ from randomized mothers, if only in terms of their preferences for a type of breastfeeding support, one would like to be able to comment on other differences, if there are any, between the population enrolled in the trial versus the general

breastfeeding population. Consequently, a small amount of information on all non-randomized eligible and ineligible mothers was collected during the course of the trial (Appendix R).

Description of the Peer Support Intervention

The intervention for this trial was telephone-based peer support with no expectations for face-to-face interactions. This mode of contact was chosen since it was: (1) similar to a mother-to-mother support program that was already in place in the community, (2) non-intrusive for both the peer volunteer and the mother, (3) a cost-effective intervention that could be readily implemented if demonstrated to be beneficial, (4) a form of support that was not currently available to all mothers, and (5) distinctly different from the traditional modes of support for new breastfeeding mothers.

To enhance understanding of the peer support intervention and to monitor compliance, the Peer Volunteer Activity Logs (Appendix F) were reviewed in relation to the peer volunteer interactions. Peer volunteers who did not return their activity log were telephoned twice by the volunteer coordinator. Seventy-eight out of 132 activity logs were returned by the peer volunteers, a 59% response rate. While no formal review process occurred to monitor the peer volunteers' interactions, the researcher did scan the activity logs when they were returned to ensure that they were being correctly completed. Any issues discovered were discussed at future orientation sessions and with the volunteer coordinator to for her to mention to the current peer volunteers when they were matched with a new mother. The only issue detected was that one peer volunteer initiated only a single telephone contact with two of the mothers she supported; one peer-initiated contact was not considered sufficient in this trial.

From the 78 activity logs, 637 contacts were made between the participating peer volunteers and mothers in the intervention group; several peer volunteers supported more than one mother. Of these contacts, 411 connections and 223 attempted connections were made (see Figure 5). Connections were defined as actual peer volunteer/mother contacts and attempts were defined as

unsuccessful attempts to connection; contacts included both connections and attempts. Specifically, 57.2% of mothers received five or more connections ($\underline{X}$ = 5.35, $\underline{SD}$ = 3.61) and the mean number of attempts was 3.10 ($\underline{SD}$ = 2.77) during the 3 months monitored.

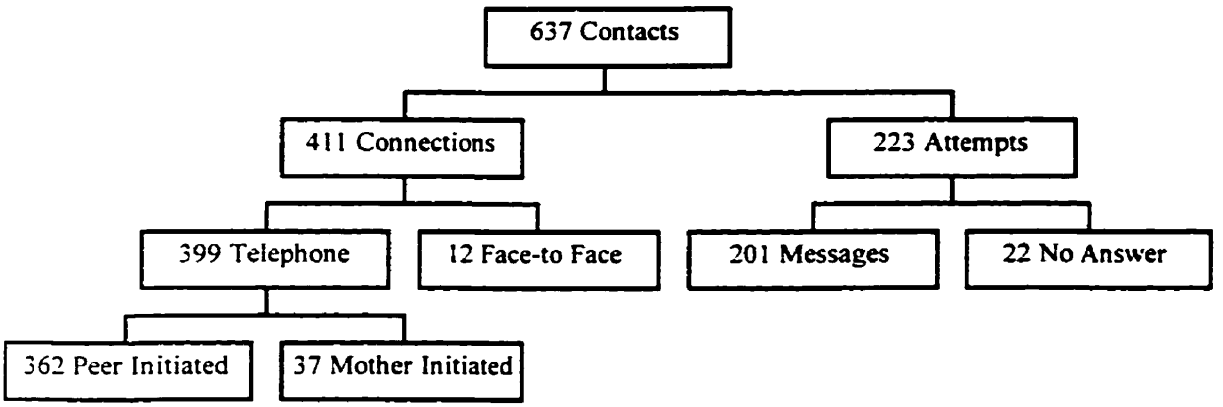


Figure 5. Schema of peer volunteer contacts

Nature of Peer Volunteer Interactions

Of the 411 connections made, 97% were telephone interactions and 3% were face-to-face meetings in various locations (homes, restaurants, and cafés). The majority of the telephone contacts were initiated by the peer volunteers; only 9.3% of mothers or partners initiated a contact. These interactions mainly comprised of the dyads conversing with each other; however, 38 referrals to health care professional were made (9.3% of interactions), and 16 contacts with professional breastfeeding services were initiated by peer volunteers for the mother they were supporting (3.9% of interactions).

Frequency of Peer Volunteer Interactions

While there were some consistencies to the nature of the peer support interactions, not all mothers received the same intensity. The mean length of time for the peer/mother relationship was 53.1 days ($\underline{SD}$ = 30.88), ranging from 1 to 121 days. The mean duration of interactions was 16.2 minutes ($\underline{SD}$ = 12.22), ranging from 2 to 65 minutes. Ninety-six percent of the initial contacts were

made within the first postpartum week, with 67% occurring within 48 hours of hospital discharge. Thirty percent of mothers actually received their initial telephone contact prior to hospital discharge. Seventy-one percent of mothers received two or more contacts within the first postpartum week and 46.2% of participants received two or more contacts in the second week as well. In contrast, 19.8% of mothers received two or more contacts in the third postpartum week and only 9% in the fourth week. Thus, the peer volunteers contacted the new mothers more intensely during the critical first two weeks when breastfeeding was being established. Overall, in the first month postpartum, the majority of mothers (74.9%) received four or more contacts from their peer volunteer. While approximately one-third (35.5%) of peer/mother relationships did not sustain into the second month. half of the mothers (48.7%) continued to received two or more contacts per month. Following the decreasing interaction trend, an additional 14.5% of relationship ceased in the second month; however, 30.3% of mothers continued to receive two or more contacts per month. In the end, 15 (19.7%) relationships actively continued past 3 months postpartum; many of the discontinued relationships closed with an open invitation for the new mothers to telephone their peer volunteer if they had any future questions or problems. It is unknown whether this actually happened or not (see Appendix R for complete details of the peer volunteer contacts).

Data Collection Questionnaires

Six questionnaires were developed to collect trial data. A two-stage process was undertaken to establish content validity for five of the data collection forms. First, a literature review was conducted for each form to ensure that an appropriate questionnaire for the desired outcome did not already exist and to identify all categories and content domains essential to the purpose of the questionnaire. The format and scoring method were chosen based on reviewed literature, thereby promoting content validity in the development of the data collection forms.

Second, to establish judgment content validity (Lynn, 1986), the data collection forms were presented to four PhD trained university professors, one Director of Maternal Child Services, two clinical nurse specialists, three registered nurses, six lactation consultants, and seven peer volunteers. Specific instruction for assessing content validity, such as the procedures described by Lynn, were not given since the forms did not lend themselves to such a detailed evaluation. Instead, the reviewers were asked to ensure that the forms were clearly and coherently written, measured what they intended to measure, and could be completed in a reasonable time. All comments regarding content domain and format issues were discussed and incorporated into the data collection forms. Finally, five breastfeeding mothers reviewed the four forms that the trial participants would be completing. The final data collection forms were as follows: Breastfeeding Assessment Questionnaire, Maternal Satisfaction with Infant Feeding Questionnaire, Perception of Peer Support Questionnaire, Additional Participant Information Form, Peer Volunteer Activity Log, and Participant Demographic and Personal Form.

Breastfeeding Assessment Questionnaire

The Breastfeeding Assessment Questionnaire (Appendix C) is a telephone data collection form developed by the researcher to assess a mother's breastfeeding behaviour every four weeks. It consists of the following five parts: infant feeding category, infant feeding rationale, breastfeeding problems and concerns, health service utilization, and sources of social support.

Part I: Infant feeding category. In this section the primary outcome for the trial was measured. All mothers are asked if their infants received breastmilk in the past 24 hours. If the mother responded "yes" her specific infant feeding/breastfeeding category was determined. The six possible infant feeding categories used in this questionnaire (exclusive breastfeeding, almost exclusive breastfeeding, high breastfeeding, partial breastfeeding, token breastfeeding, and bottlefeeding) were developed by Labbok and Krasovec (1990) to promote consistency in the

definition of breastfeeding used in research and to facilitate comparison of research results. To ensure uniformity in infant feeding categorization, a decision tree was developed.

Part II: Infant feeding rationale. When mothers were not exclusively breastfeeding, they were asked a specific open-ended question in order to understand the rationale behind the mother's decision to augment her breastfeeding in a particular way or discontinue completely. Not all mothers completed this section; only women who altered their method of infant feeding were asked to respond to this question.

Part III: Breastfeeding problems and concerns. A list of 50 breastfeeding problems and concerns was developed from a review of the literature. Harrison and Hicks (1983), Hiser (1987), Kearney, Cronenwett, and Barrett (1990) were particularly helpful. The list is divided into three content domains: baby, mother, and partner/family (Graef, McGhee, Rozycki, Fescina-Jones, Clarke, Thompson, & Brooten, 1988); the number of concerns for each domain was summed.

Part IV: Health service utilization. Participants were asked whether they had actively sought help for their identified breastfeeding problem(s). If help was sought, a list of potential sources was presented. Based on the theoretical model of social support proposed by Stewart (1989a), the first seven sources of help were categorized as professional support and the following five sources were classified as social support. Information regarding the identification of the breastfeeding problem help was sought for, the frequency of use, and the level of satisfaction with the support received.

Part V: Sources of social support. This section contained three categorical questions regarding support from social networks. Specifically, a question assess the assistance from the baby's father, other sources of support, and negative breastfeeding support.

Maternal Satisfaction with Infant Feeding Questionnaire

The Maternal Satisfaction with Infant Feeding Questionnaire (Appendix D) was developed by the researcher to assess women's satisfaction with how they actually fed their infants. The questionnaire has two response formats: Likert scale and categorical responses. The first section is a

12-item Likert scale based on the Maternal Breastfeeding Evaluation Scale (MBES) (Leff, Jefferis, & Gagne, 1994). The MBES was developed following a qualitative study of maternal descriptions of successful breastfeeding experiences; from this study five categories emerged: infant health, infant satisfaction, maternal enjoyment, attainment of desired maternal role, and lifestyle compatibility (Leff et al.). Content validity for these categories was established according to procedures described by Lynn (1986). To psychometrically assess the MBES categories, a sample of 442 breastfeeding women completed the 56-item Likert scale. A retest questionnaire was completed by a subsample of 28 women. Exploratory factor analysis resulted in three factors, accounting for 38.5 % of the variance: maternal enjoyment/role attainment (29%), infant satisfaction/growth (5 %), and lifestyle/maternal body image (4 %). A revised 30-item MBES was developed using items loading strongly on these three factors. Cronbach's alphas for the revised scale and subscales were .93, .93, .88, and .80 respectively. Test-retest correlations ($n = 28$) were .93, .93, .94, and .82 respectively ($p < .001$ for all) (Leff et al.; Riodan, Woodley, & Heaton, 1994).

From the three MBES subscales, 12 items were selected and neutrally reworded (i.e. feeding was substituted for breastfeeding) to produce the Maternal Satisfaction with Infant Feeding Questionnaire. Participants responded to each item by stating a number that best described their feelings or attitude. Items were rated on a 5-point scale, with 1 representing strongly disagree and 5 representing strongly agree. All items, except for one, were presented positively; the scores for all items were summed after the appropriate reverse scoring to produce a total score. The possible range of scores is 12 to 60 with higher scores reflecting higher degrees of maternal satisfaction with infant feeding. The second section of the questionnaire included three categorical questions about future behaviour and one question about overall satisfaction with feeding (see Appendix T for psychometric assessment criteria and summary; see Appendix U for the psychometric assessment of the MSIFQ).

Perception of Peer Support Questionnaire

The Perception of Peer Support Questionnaire (Appendix E) was developed by the researcher to assess a mother's perception of the support she received from her peer volunteer. The first section (questions 1 -10) was a 10-item Likert scale based on the theoretical model of social support proposed by House (1981) and the concept analysis of peer support that the researcher conducted. Specifically, the scale assessed for the three broad functions of supportive acts: emotional support (questions 1-5) informational support (questions 6 -8). and appraisal support (questions 9-10). Participants responded to each item by stating a number that best described their feelings or attitude. Items were rated on a 5-point scale, with 1 representing strongly disagree and 5 representing strongly agree. All items were presented positively; the scores for all items were summed to produce a total score at an interval level of measurement. The possible range of scores was 10 to 50 with higher scores reflecting higher degrees of satisfaction with peer support. The second section of the questionnaire included seven categorical questions and one question about overall satisfaction. (see Appendix V for the psychometric assessment of the PPSQ).

Additional Participant Information Form

The Additional Participant Information Form (Appendix Q) was developed by the researcher after the second hospital was added as a recruitment site. The purpose of this form was to assess differences in hospital and postpartum care between the two sites that could influence breastfeeding behaviour. The form includes eight categorical questions; participants responded to these questions by either stating yes/no or choosing among several options.

Peer Volunteer Activity Log

The Peer Volunteer Activity Log (Appendix F) was developed by the researcher and the community breastfeeding program board members to assess the nature and intensity of the support peer volunteers delivered to breastfeeding women. All information was summed to provide

information regarding peer volunteer contacts, connections, and attempts within specific time periods.

Participant Demographic and Personal Form

A Participant Demographic and Personal Form (Appendix O) was developed by the researcher, from a review of the literature, to describe the sample. The form consisted of 17 questions about: decision to breastfeed, initiation of breastfeeding, intended duration of breastfeeding, whether the participant was breastfed as a baby or not, whether a close family member or friend had breastfed, prenatal and breastfeeding class attendance, smoking status, level of education, ethnicity, and household income. Participants responded to these questions by either stating yes/no or choosing among several categorical options.

Data Management

Baseline information was collected by the researcher before randomization. Outcome and other descriptive data were collected by a research assistant on developed forms following a clearly delineated time-line; all forms were collected from the research assistant and the community breastfeeding program volunteer coordinator by the researcher. Content analysis was conducted on all open-ended questions by the researcher and an experienced colleague who was not involved in the trial. Categories were developed by the individual researchers and compared for consistency. Category congruence was achieved over 90% of the time and coding schemes were developed. To ensure the coding schemes were being consistently applied, another colleague was asked to code over 20 trial questionnaires. Again, inter-coder reliability was high at approximately 87% with any discrepancies discussed. Data were entered into a data management system (SPSS) twice, once by the researcher and once by a research assistant, and logic and range checks were used to verify the accuracy of the data. In addition, SPSS Inc. in Chicago was contacted, via email, and a senior programmer developed a program specifically for detecting inconsistencies between the two datasets

(Appendix W). Any discrepancies were checked with the original data forms by the researcher. If data forms had missing data, the researcher telephoned the participant to obtain the missing information. In total, only nine participants were contacted to obtain missing data. Four telephone contacts were conducted in relation to incomplete hospital information and two participants were contacted in relation to the Perception of Peer Support Questionnaire that was not completed due to a lack of time or a crying infant. Three mothers were contacted to obtain the first month breastfeeding assessment (the research assistant was unable to contact two mothers; the other mother decided to terminate her participation in the study).

Data Analysis

An "intention to treat" approach, which includes all patients as randomized, was used for the primary analysis of data. Descriptive statistics (means, standard deviations, proportions, etc.) were calculated to check for any major dissimilarities in the study groups with regard to sample demographics and other baseline information. A two-tailed significance level of .05 was used for all data analysis. The statistical method, using SPSS (1995), to compare groups depended on the distribution and level of measurement of the outcome variable in question. The specific data analyses for the individual research questions were as follows.

Primary Research Question: Breastfeeding at 3 Months

A chi-square test for trend was calculated. Odds ratios and corresponding 95% confidence intervals were used to estimate the relative risk.

Secondary Questions: Levels of Breastfeeding

A Mann-Whitney U test was conducted to determine the differences between the two study groups with respect to specific breastfeeding category at 4, 8, and 12 weeks. After combining the conceptually congruent infant feeding categories of exclusive, almost exclusive, and high breastfeeding to promote clinically significant results, a Pearson's chi-square test was conducted to

determine the differences between the two study groups at different time points. Descriptive statistics (means, standard deviations, proportions, etc.) were used to explain maternal rationales for supplementation and chi-square tests with Fisher's exact test procedures were conducted to determine differences in rationales between the two study groups.

Secondary Research Question: Maternal Satisfaction with Infant Feeding

Pearson's chi-square tests were used to examine differences between the two study groups for categorical data; independent two-sample t-tests were conducted for data at the interval level of measurement. To assess the relationship between maternal satisfaction with infant feeding scores, breastfeeding categories, and breastfeeding problems, non-parametric Spearman's Rank Order Correlation Coefficients were calculated due to negatively skewed distribution of maternal satisfaction scores.

Breastfeeding Problems and Concerns

Descriptive statistics (means, standard deviations, proportions, etc.) were calculated and Pearson's chi-square analyses were conducted to examine differences between the two study groups and the most frequently reported breastfeeding problems. Independent two-sample t-tests were performed to examine overall differences between the two study groups.

Health Service Utilization

Descriptive statistics (means, standard deviations, proportions, etc.) were calculated to demonstrate breastfeeding support utilization patterns. Chi-square analyses were calculated to examine differences between the two study groups.

Perception of Peer Support

Descriptive statistics (means, standard deviations, proportions, etc.) were calculated to describe mother's perception of the peer support received.

Peer Volunteer Activity

Descriptive statistics (means, standard deviations, proportions) were calculated to depict peer volunteer interaction patterns. Pearson's correlation was used to examine the relationship between the frequency of peer volunteer contacts, infant feeding category, and number of breastfeeding problems and concerns reported within the experimental group. To assess the relationships among the frequency of peer volunteer contacts, maternal satisfaction with infant feeding, and perception of peer support within the experimental group, Spearman's Rank Order Correlation Coefficients were calculated.

Associations With and Prediction of Breastfeeding Duration

Relationships between maternal sociodemographic, hospital, and postpartum variables and breastfeeding at 3 months postpartum were examined using the Pearson's chi-square test and Fisher's Exact test procedures. Maternal/hospital/postpartum variables from the preceding analyses, which had significant differences between mothers who continued and discontinued breastfeeding at 3 months, were considered to be potentially important predictors and were included in the logistic regression model. Two-way interaction terms were tested in the model to identify any combined effects of the mother's age with other predictors. A forward step-wise selection was used for model building with the score statistic used for entering variables and the Wald statistic used for removing variables from the model. The Wald statistic is a general command for analyzing nonlinear function of parameters (Statsoft, 1999). Specifically, it is used to test the null hypothesis in logistic regression that a particular logit (effect) coefficient is zero. That is, it tests the significance of the logit coefficient associated with a given independent variable. To determine significance, one reviews the corresponding significance level rather than the Wald statistic itself. At each step of the model building process, the variable with the smallest significance level for the score statistics that was below the chosen cutoff value of 0.05 was entered into the model. All variables in the forward stepwise block that were entered were then examined to see if they met removal criteria. The Wald

statistic for all variables in the model was examined and the variable significance level for the Wald statistic was assessed to ensure it did not exceed the 0.1 chosen cutoff value. When no variables met removal criteria, the next variable was entered into the model. The final model was accepted based on the overall chi-square test of fit statistic.

Ethical Considerations

This trial was approved by a Human Subjects Review Committee in the University of Toronto. Ethical approval also was granted by the hospital A and hospital B research review boards to access their postpartum clients. Finally, approval was given by the regional community breastfeeding program Board members.

To protect the human rights of the participants, a written consent was obtained from all participants. The participation of the new mothers was strictly voluntary, with the freedom to withdraw or not answer any question without alteration in their care. Participants were fully informed of the nature and time commitments of the trial and that direct benefits from their participation might not occur.

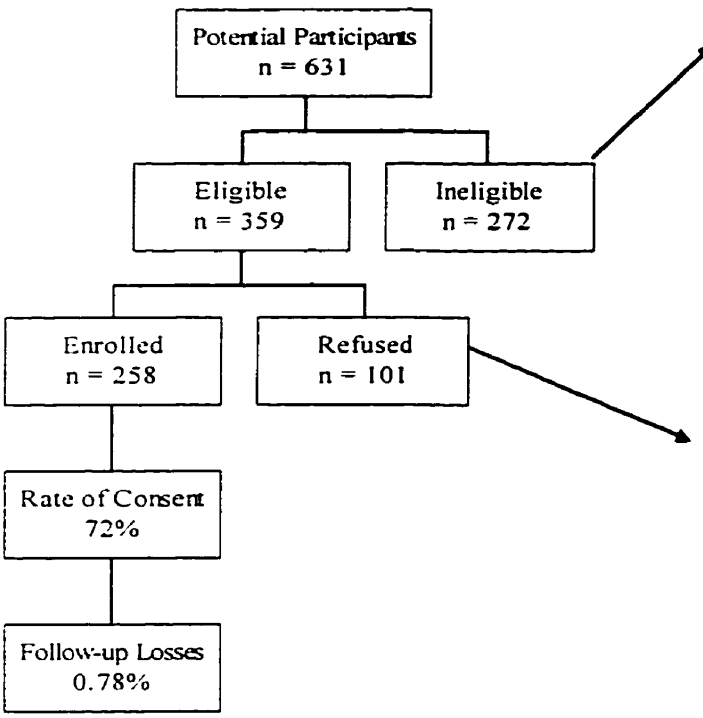
To respect the confidentiality of the participants' responses, a code number was assigned at the beginning of data collection, and only this code was used to identify the data. A code sheet with the name of the participant was kept in a locked filing cabinet by the researcher, and destroyed upon completion of the study. The consent forms and questionnaires were also locked in the filing cabinet and will be destroyed in six years.

CHAPTER III

RESULTS

Sample

In total, 631 potential participants were assessed for inclusion criteria during a nine month period. Of these potential participants, 359 mothers were eligible and 272 were ineligible (see Figure 8). The most common reason for ineligibility was bottlefeeding (28.3%) followed by residential area (27.2%). Of the 359 eligible mothers, 101 (28%) declined enrollment, citing sufficiency of current support network most frequently (48.5%). Thus, the acceptance rate for enrollment into the trial was 72%.



Reasons for Ineligibility	n (%)
Bottlefeeding	77 (28.3)
Residence not in geographic area	74 (27.2)
Enrolled in prenatal peer program	48 (18.0)
Ill infant	20 (7.4)
< 37 weeks gestation	19 (7.0)
Did not understand/speak English	14 (5.1)
> singleton birth	10 (3.7)
Maternal reason	7 (2.6)
Moving	2 (0.7)

Reasons for Refusal	n (%)
Enough support with current network	49 (48.5)
Not interested	22 (21.8)
Overwhelmed	16 (15.8)
No breastfeeding problems	8 (7.9)
No stranger telephoning	6 (5.9)

Figure 8. Schema of trial recruitment.

Sample Characteristics

The majority of the 256 participants were married (91.4%), identified themselves as Canadian (73%), completed postsecondary education (74.7%), and had an annual household income

Table 11

Baseline Demographic Characteristics of the Experimental and Control Groups

Variable	Level	Experimental (N = 132) n	%	Control (N = 124) n	%	p
Age	< 20 years	6	(4.5)	5	(4.0)	ns
	20-24 years	13	(9.8)	11	(8.9)	
	25-29 years	52	(39.4)	54	(43.5)	
	30-34 years	47	(35.6)	38	(30.6)	
	≥ 35 years	14	(10.6)	16	(12.9)	
Marital Status	Married	119	(90.2)	115	(92.7)	ns
	Other	13	(9.8)	9	(7.3)	
Education	Elementary	5	(3.8)	3	(2.4)	ns
	High School	29	(22.0)	28	(22.6)	
	College	44	(33.3)	45	(36.3)	
	Undergrad University	39	(29.5)	37	(29.8)	
	Graduate University	15	(11.4)	11	(8.9)	
Decision to Breastfeed	Before pregnancy	97	(73.5)	73	(58.9)	χ^2 (2, N=256) = 7.55, p = .02
	During pregnancy	34	(25.8)	51	(41.1)	
	At/after birth	1	(0.8)	0	(0)	
Intended duration of Breastfeeding	< 1- 3 months	13	(9.8)	6	(4.8)	ns
	4 months	9	(6.8)	12	(9.7)	
	5 months	11	(8.3)	10	(8.1)	
	6 months	55	(41.7)	42	(33.9)	
	> 6 months	24	(18.2)	21	(16.9)	
	As long as I can	11	(8.3)	17	(13.7)	
	Do not know	9	(6.8)	16	(12.9)	
Family/Friend Breastfed Before	Yes	123	(93.2)	113	(91.1)	ns
	No	9	(6.8)	11	(8.9)	
Attended Prenatal Class	Yes	97	(73.5)	84	(67.7)	ns
	No	35	(26.5)	40	(32.3)	
Attended Breastfeeding Class	Yes	18	(13.6)	19	(15.3)	ns
	No	114	(86.4)	105	(84.7)	
Smoked Cigarettes	Before Pregnancy	36	(27.3)	34	(27.4)	ns
	During Pregnancy	24	(18.2)	19	(15.3)	
Ethnic Group	Canadian	97	(73.5)	90	(72.6)	ns
	French Canadian	4	(3.0)	3	(2.4)	
	British	6	(4.5)	6	(4.8)	
	Italian	2	(1.5)	5	(4.0)	
	Black	2	(1.5)	0	(0)	
	Chinese	1	(0.8)	2	(1.6)	
	Indo-Pakistani	3	(2.3)	2	(1.6)	
	West Asian-Arab	2	(1.5)	1	(0.8)	
	German	1	(0.8)	2	(1.6)	
	Latin American	1	(0.8)	1	(0.8)	
	Other	13	(9.8)	12	(9.7)	
Born in North America	Yes	113	(85.6)	108	(87.1)	ns
	No	19	(14.4)	16	(12.9)	
Annual Household Income [a]	$0 - 19,999	8	(6.5)	5	(4.3)	ns
	$20,000 - 39,999	15	(12.1)	13	(11.2)	
	$40,000 - 59,999	27	(21.8)	26	(22.4)	
	$60,000 - 79,999	25	(20.2)	23	(19.8)	
	$80,000 - +	49	(39.5)	49	(42.2)	

[a] 16 missing cases, 240 valid cases

greater than $40,000 Canadian (77.8%) (see Table 11). The mean age was 29.0 years (SD = 4.68) ranging from 17 to 41 years (peer group X = 29.0, SD = 4.62; control group X = 28.9, SD = 4.77). While the majority of the participants had decided to breastfeed before pregnancy (66.4%) and had a close family member or friend with breastfeeding experience (92.2%), only half of the mothers were breastfed themselves (52.7%). Prenatal classes were attended by many participants (70.7 %), while only a few (14.5%) participated in a prenatal breastfeeding class. Ninety-one percent of the participants had thought about how long they would like to breastfeed; approximately half (55.5%) intended to continue for six months or more. Seventy-seven percent of the participants gave birth vaginally; 35.7% had had an episiotomy and 69.4% had had epidural analgesia (see Table 12). The mean gestational age was 39.4 weeks (SD = 1.17) and the mean infant weight was 3418 g (SD = 468.21). Although most mothers gave birth vaginally, only 59.2% were discharged home within 48 hours of delivery. While 94.8% of the participants did not experience any postpartum complications, 40% (n = 100) of infants were admitted to the Special Care Nursery (SCN). The most common reason for admission was observation of increased heart rate, respirations, or blood sugar. The mean length of time in the SCN was 16.3 hours (SD = 38.27), with a minimum of 3 hours to a maximum of 14 days (peer group X = 19.4, SD = 46.02; control group X = 12.8, SD = 27.09). Thirty-seven percent of all participants indicated that they experienced serious breastfeeding problems while they were in the hospital and 44.9% of infants received some form of supplementation while in hospital. Once discharged home, 13.6% of mothers received at least one home visit from a health care professional and 5.6% of infants (n = 14) were readmitted to the hospital. The most common reason for readmission was jaundice (n = 12); one infant required open-heart surgery (control group) and another infant had a serious kidney problem (peer group). From all the preceding sample characteristics, only one significant difference was observed between the two groups: more women in the peer support group made their decision to breastfeed before pregnancy than women in the

Table 12

Baseline Delivery and Postpartum Characteristics of the Experimental and Control Groups[a]

Variable	Level	Experimental (N = 132) n	(%)	Control (N = 124) n	(%)	P
Hospital	Hospital A	66	(50)	69	(55.6)	ns
	Hospital B	66	(50)	55	(44.4)	
Mode of Delivery	Spontaneous	52	(39.4)	46	(37.1)	ns
	Low forceps	18	(13.6)	19	(15.3)	
	Mid forceps	12	(9.1)	6	(4.8)	
	Vacuum extraction	25	(18.9)	19	(15.3)	
	Caesarean section	25	(18.9)	34	(27.4)	
Perineum	Intact	14	(10.6)	5	(4.0)	ns
	Episiotomy	49	(37.1)	43	(34.7)	
	Laceration only	44	(33.3)	42	(33.9)	
Analgesia	None	11	(8.3)	10	(8.1)	ns
	Epidural	89	(67.4)	88	(71.5)	
	General	4	(3.0)	2	(1.6)	
	Local only	15	(11.4)	12	(9.8)	
	Nitrous oxide only	11	(8.3)	8	(6.5)	
	Opioid only	2	(1.5)	3	(2.4)	
Time of First Feed	≤ 1 hour	45	(34.1)	43	(34.7)	ns
	2-10 hours	75	(56.8)	68	(54.8)	
	≥ 11 hours	12	(9.1)	13	(10.5)	
Length of Stay	24 hours	25	(19.1)	7	(5.9)	ns
	36 hours	5	(3.9)	7	(5.9)	
	48 hours	54	(41.2)	50	(48.1)	
	60 hours	7	(5.3)	4	(3.4)	
	72 hours	21	(16.0)	26	(21.8)	
	96 hours	12	(9.2)	18	(15.1)	
	> 96 hours	7	(5.4)	7	(5.9)	
Baby in SCN	Yes - observation	25	(19.1)	18	(15.1)	ns
	- infection	13	(9.9)	10	(8.4)	
	- jaundice	6	(4.6)	4	(3.4)	
	- c-section only	8	(6.1)	8	(6.7)	
	- maternal issue	1	(0.8)	4	(3.4)	
	- other	3	(2.3)	0	(0)	
	- Total	56	(42.7)	44	(37.0)	
	No	75	(57.3)	75	(63.0)	
Maternal Complications	Yes	4	(3.1)	9	(7.6)	ns
	No	127	(96.9)	110	(92.4)	
Serious Breastfeeding Probs. in Hospital	Yes	48	(36.6)	45	(37.8)	ns
	No	83	(63.4)	74	(62.2)	
Hospital Supplementation	Yes	62	(47.0)	53	(42.7)	ns
	Unsure	5	(3.8)	5	(4.0)	
	No	65	(49.2)	66	(53.2)	
Professional Home Visit	Yes	15	(11.5)	19	(16.0)	ns
	No	116	(88.5)	100	(84.0)	
Hospital Readmission	Yes- baby	10	(7.6)	4	(3.4)	ns
	- mother	0	(0)	1	(0.8)	
	No	121	(92.4)	114	(95.8)	

[a] sample size is variable due to missing data; it ranges from 250 to 256 valid cases

control group [χ^2 (2, N = 256) = 7.55, p = .02]; this result could have occurred due to multiple comparisons.

Baseline Characteristics of Participants and Eligible Non-Participants

Baseline information from the medical records was used to compare participants with eligible non-participants. No significant differences were found between the two groups (Table 13).

Table 13

Comparisons of Baseline Characteristics of Participants and Non-Participants

Variable	Level	Declined (N = 101) n (%)	Enrolled (N = 256) n (%)	P
Hospital	Hospital A	54 (53.5)	135 (52.7)	ns
	Hospital B	47 (46.5)	121 (47.3)	
Age	< 20 years	5 (5.0)	11 (4.3)	ns
	20-24 years	13 (12.9)	24 (9.4)	
	25-29 years	38 (37.6)	106 (41.4)	
	30-34 years	30 (29.7)	85 (33.2)	
	≥ 35 years	15 (14.9)	30 (11.7)	
Marital status	Married	91 (90.1)	234 (91.4)	ns
	Other	10 (9.9)	22 (8.6)	
Ethnicity	Caucasian	84 (83.2)	N/A	
	Other	17 (16.8)		
Mode of Delivery	Spontaneous	29 (28.7)	98 (38.3)	
	Low forceps	9 (8.9)	37 (14.5)	
	Mid forceps	5 (5.0)	18 (7.0)	
	Vacuum extraction	24 (23.8)	44 (17.2)	
	Cesarean section	34 (33.7)	59 (23.0)	
Perineum	Intact	2 (2.0)	19 (4.0)	ns
	Episiotomy	24 (24.5)	92 (34.7)	
	Laceration only	38 (38.7)	86 (33.9)	
Analgesia	None	4 (4.1)	10 (8.1)	ns
	Epidural	73 (74.5)	88 (71.5)	
	General	4 (4.1)	2 (1.6)	
	Local only	9 (9.2)	12 (9.8)	
	Nitrous oxide only	6 (5.1)	8 (6.5)	
	Opioid only	5 (5.1)	3 (2.4)	

Mothers Lost to Follow-up

Of the 258 mothers enrolled into the trial, two participants were completely lost to follow-up (0.78%), and thus, not included in the data analyses. Both were in the control group. One participant gave her cellular phone as a contact number and later declined to complete the postpartum

questionnaires due to the cost of cellular service charges. Reimbursement of telephone charges was offered by the researcher but declined by the participant. The second participant gave a fax number instead of a telephone number for the postpartum contact. Several different attempts to locate a telephone number for this participant were unsuccessful.

Primary Research Question: Any Breastfeeding at 3 Months Postpartum

The primary research question for this trial was the effect of peer support on breastfeeding duration and the primary outcome was "any breastfeeding," operationalized as any breast milk within the last 24 hours at 3 months postpartum. Mothers in the peer group were significantly more likely to be breastfeeding at three months and at all time periods (Table 14).

Table 14

Chi-Square Test for Trend Analysis of the Duration of Any Breastfeeding Between Groups

Time	Peer Group (N = 132) n (%)	Control Group (N = 124) n (%)	χ^2	p	OR	95% CI
4 Weeks	122 (92.4)	104 (83.9)	4.52	.03	2.35	1.05 - 5.24
8 Weeks	112 (84.8)	92 (74.2)	4.48	.03	1.95	1.04 - 3.63
12 Weeks	107 (81.1)	83 (66.9)	6.67	.01	2.11	1.19 - 3.75

Note. df = 1

Secondary Analysis: Breastfeeding Supplementation

To further explore the impact of peer support on breastfeeding duration, two secondary analyses were conducted. First, the two groups were compared according to the level of breastfeeding, using the recommended infant feeding categories of exclusive, almost exclusive, high, partial, token, and bottlefeeding (Labbok & Krasovec, 1990). Significantly more mothers in the peer group had higher levels of breastfeeding (e.g. infant was receiving more breast milk) at 4 weeks and 12 weeks (mean rank) (see Table 15); significantly more women in the peer group exclusively breastfed at 4 weeks and 12 weeks postpartum. Second, the clinically similar infant feeding categories of exclusive, almost exclusive, and high breastfeeding were combined to form a new

variable "complete breastfeeding" and the clinically similar partial and token breastfeeding and bottle-feeding categories were combined to form the new variable "incomplete breastfeeding." Significant differences favouring the peer support group were found at 4 weeks, but not at 8 weeks and 12 weeks postpartum.

Table 15

Comparisons of Infant Feeding Categories, Both Specific and Combined, Between Groups

Time	Infant Feeding Category	Peer (N=132) n (%)	Control (N=124) n (%)	χ^2	p	Mean Rank Peer	Mean Rank Control	p
4 weeks	Exclusive	98 (74)	78 (63)	3.83	.05	120.58	136.93	.03
	Almost Exclusive	4 (3)	6 (5)					
	High	6 (5)	2 (2)					
	Partial	11 (8)	16 (13)					
	Token	3 (2)	2 (2)					
	Bottlefeeding	10 (8)	20 (16)					
	"Complete"	108 (82)	86 (69)	5.41	.02			
	"Incomplete"	24 (18)	38 (31)					
8 Weeks	Exclusive	83 (63)	68 (55)	1.71	ns	121.94	135.48	ns
	Almost Exclusive	5 (4)	4 (3)					
	High	5 (4)	5 (4)					
	Partial	18 (14)	14 (11)					
	Token	1 (.8)	2 (2)					
	Bottlefeeding	20 (15)	31 (25)					
	"Complete"	93 (70)	77 (62)	2.00	.16			
	"Incomplete"	39 (30)	47 (38)					
12 Weeks	Exclusive	75 (57)	50 (40)	6.96	.01	118.11	139.56	.01
	Almost Exclusive	1 (.8)	9 (7)					
	High	3 (2)	8 (6)					
	Partial	26 (20)	15 (12)					
	Token	2 (1)	1 (1)					
	Bottlefeeding	25 (19)	41 (33)					
	"Complete"	79 (60)	67 (54)	.88	.34			
	"Incomplete"	53 (40)	57 (46)					

Over 50% of the study sample were practicing some form of supplementation at 12 weeks postpartum. Participants supplemented their infants for 11 various reasons. The top five explanations given were: insufficient milk supply (n = 55), convenience (n = 22), problems with infant behaviour i.e. fussiness/frequent crying (n = 19), feeding problems e.g. latching or feeding frequently (n = 19), and returning to work (n = 15) (Appendix X). Mothers in the almost exclusive and high

breastfeeding categories reported infant behavioural problems, not having expressed breastmilk, and "to see if infant would take formula/bottle" as the most frequent reasons for supplementation. In contrast, mothers in the partial breastfeeding category cited insufficient milk supply, convenience, and returning to work as the leading rationales for supplementation. Finally, mothers in the token and bottlefeeding categories stated the most common reasons for discontinuation were insufficient milk supply, feeding difficulties, and infant physical problems (Appendix X). There were no important group differences in relation to rationales for supplementing or discontinuing breastfeeding (Appendix Y). In particular, the same percentage of mothers in the peer group cited insufficient milk supply (the leading cause for supplementation/discontinuation in developed countries) as mothers in the control group.

Secondary Question: Maternal Satisfaction with Infant Feeding

The secondary research question for this trial was the effect of peer support on maternal satisfaction with infant feeding method and was operationalized with the Maternal Satisfaction with Infant Feeding Questionnaire (MSIFQ) (Appendix D); 252 participants (131 in the peer group and 121 in the control group) completed the MSIFQ. The majority of participants (96.4%) were satisfied with their infant feeding method and 92.5% would recommend breastfeeding to friends; 6.7% would recommend neither breastfeeding or bottlefeeding since it "is a mother's own choice." Of the eight mothers who were not satisfied with how they fed their infant, seven mothers stated they would "rather be breastfeeding" with one mother specifically responding that she would rather be "exclusively breastfeeding." One dissatisfied mother stated she did "not have a choice and had to bottlefeed." Significantly more mothers in the control group were dissatisfied with their infant feeding method [χ^2 (2, $\underline{N}$ = 252) = 9.81, $\underline{p}$ = .02].

Ninety-six percent of participants ($\underline{n}$ = 241) indicated they would breastfeed their next baby; 68.9% responded they would do it the same way as the first child (see Table 18). However, 68

mothers stated they would breastfeed their next child differently, with 24 mothers indicating they would breastfeed longer and 16 mothers responding they would use different methods or strategies; seven mothers explicitly stated they would not supplement their infant at all. Of the 10 mothers that responded that they would bottlefeed their next baby, eight mothers gave maternal reasons such as "less anxiety and stress" and "recuperate from delivery quicker." No significant differences were found between the groups in relation to future infant feeding method [χ^2 (1, N = 252) = 3.04, p = .08]. However, additional analysis revealed that significantly more mothers in the peer group stated they would breastfeed their next infant the same way as their first and significantly more mothers in the control group would breastfeed their next infant differently [χ^2 (1, N = 252) = 4.12, p = .05].

Table 18

Comparison of Responses About Subsequent Method of Feeding

How would you feed your next baby?	Peer (N = 130) n (%)	Control (N = 121) n (%)	χ^2 (df) , p
Breastfeed	125 (96)	116 (95.9)	.01(1), ns
Different from the first baby	29 (23.2)	39 (33.6)	4.12 (1), .05
"Breastfeed longer"	9	15	
Use different strategy/method	9	7	
"Hope it goes better"	4	10	
"Would not supplement"	3	4	
"Just different"	2	2	
"Prepare more"	2	1	
Bottlefeed	5 (.04)	5 (.04)	
"For emotional reasons"	3	3	
"For my health"	0	2	
No reason	2	0	

Although approximately one third of mothers stated they would breastfeed their next child differently and some participants expressed disappointment, the overall mean satisfaction score on the Likert-scale part of the MSIFQ was negatively skewed at 53.41 (SD = 5.81) with a minimum of 36 and a maximum of 60 (score range was from 12 to 60). This result provided further evidence that the majority of mothers were satisfied with their infant feeding method. Mean satisfaction scores between the peer (X = 53.81, SD = 5.69) and control (X = 52.98, SD = 5.94) groups were not

significant [t (250) = 1.13, p = .73]. Additional analysis revealed negative, weak to modest correlations between maternal satisfaction scores and (1) infant feeding categories and (2) overall breastfeeding problems (see Table 19). In particular, a trend appeared that the less the mother supplemented her infant and the fewer breastfeeding problems she reported, the more satisfied she was with her infant feeding method.

Table 19

Relationships Between Maternal Satisfaction Scores, Infant Feeding Category, and Breastfeeding Problems

	MSIFQ Scores		
Variable and Time	N	r_s	p
Infant Feeding Category			
4 weeks	252	-.21	.001
8 weeks	252	-.27	.001
12 weeks	252	-.27	.001
Overall Total Breastfeeding Problems			
4 weeks	252	-.25	.001
8 weeks	225	-.32	.001
12 weeks	205	-.31	.001

Breastfeeding Problems and Concerns

All participants experienced difficulties after hospital discharge, with the highest mean number of problems occurring within the initial 4 weeks (X = 12.08, SD = 5.54) and the mean number of problems decreasing at 8 weeks (X = 6.58, SD = 4.48) and 12 weeks (X = 3.87 , SD = 3.64). While problems diminished over time, many maternal issues remained constant throughout the 3 months (see Table 20). Mothers repeatedly reported that they were tired, had difficulty finding time for themselves, and that they felt isolated and tied down. In addition to these feelings, almost half (n = 115) of the mothers indicated that they felt sad and tearful in the first 4 weeks; at 3 months postpartum, other similar affective concerns evolved such as worrying about weaning (n = 40) and

Table 20

Between-Group Comparisons of the Most Frequently Reported Maternal Problems

Problems at 4 Weeks (N = 254)

Rank	Specific Problem	Type of Problem	Incidence f (%)	Peer N=132 n (%)	Control N=122 n (%)	χ^2 (df=1)	p
1	Leaking breast milk	Maternal - Breast	193 (76)	102 (77)	91 (75)	.25	ns
2	Tired/sleep deprivation	Maternal - Physical	153 (60)	81 (61)	72 (59)	.15	ns
3	Engorged breast	Maternal - Breast	143 (56)	83 (63)	60 (49)	4.84	.03
4	Baby not latching	Baby - Feeding	140 (55)	73 (55)	67 (55)	.00	ns
5	Baby spitting-up	Baby - Feeding	137 (54)	80 (61)	57 (48)	4.92	.03
6	Finding time for self	Maternal - Emotional	133 (52)	70 (53)	63 (52)	.05	ns
7	Breastfeeding too frequently	Baby - Feeding	122 (48)	65 (49)	57 (47)	.16	ns
8	Feeling sad/crying	Maternal - Emotional	115 (45)	63 (47)	52 (43)	.67	ns
9	Feeling isolated/tied down	Maternal - Emotional	109 (43)	56 (42)	53 (43)	.03	ns
10	Sore Nipples	Maternal - Breast	99 (39)	48 (36)	51 (42)	.79	ns

Problems at 8 Weeks (N = 226)

Rank	Specific Problem	Type of Problem	Incidence f (%)	Peer N=122 N	Control N=104 n	χ^2	p
1	Leaking breast milk	Maternal - Breast	113 (50)	61 (50)	52 (50)	.00	ns
2	Tired/sleep deprivation	Maternal - Physical	101 (45)	50 (41)	51 (49)	1.47	ns
3	Baby spitting-up	Baby - Feeding	93 (41)	56 (46)	37 (36)	2.47	ns
4	Finding time for self	Maternal - Emotional	86 (38)	48 (39)	38 (37)	.19	ns
5	Growth pattern/spurt	Baby - Physical	68 (30)	42 (34)	26 (25)	2.37	ns
6	Feeling isolated/tied down	Maternal - Emotional	63 (28)	39 (32)	24 (23)	2.21	ns
7	Breastfeeding too frequently	Baby - Feeding	62 (27)	34 (28)	28 (27)	.03	ns
8	Baby fussy at breast	Baby - Behaviour	59 (26)	40 (33)	19 (18)	6.13	.01
9	Baby crying frequently	Baby - Behaviour	56 (25)	27 (22)	29 (28)	.99	ns
10	Baby fussy after feeding	Baby - Behaviour	47 (21)	29 (24)	18 (17)	1.42	ns

Problems at 12 Weeks (N = 205)

Rank	Specific Problem	Type of Problem	Incidence f (%)	Peer N=112 N	Control N=93 n	χ^2	p
1	Leaking breast milk	Maternal - Breast	68 (33)	40 (36)	28 (30)	.72	ns
2	Tired/sleep deprivation	Maternal - Physical	59 (29)	33 (29)	26 (28)	.06	ns
3	Baby spitting-up	Baby - Feeding	59 (29)	35 (31)	24 (26)	.73	ns
4	Finding time for self	Maternal - Emotional	44 (22)	22 (20)	22 (24)	.49	ns
5	Growth pattern/spurt	Baby - Physical	44 (22)	25 (22)	19 (20)	.11	ns
6	Weaning	Maternal - Emotional	40 (20)	20 (18)	20 (22)	.43	ns
7	Returning to work	Maternal - Emotional	38 (19)	23 (21)	15 (16)	.65	ns
8	Baby fussy at breast	Baby - Behaviour	33 (16)	19 (17)	14 (15)	.14	ns
9	Feeling isolated/tied down	Maternal - Emotional	31 (15)	19 (17)	12 (13)	.65	ns
10	Breastfeeding in public	Maternal - Emotional	26 (13)	18 (16)	8 (9)	2.56	ns

returning to work (n = 38). Other maternal problems reported were transient, such as engorged breasts and sore nipples, except for the persistent dilemma of leaking breasts, which was the most frequently reported of all problems. Unlike the maternal problems, the baby issues developed gradually until they peaked during the second month. While the baby spitting up was a continuing problem, the first month consisted primarily of feeding difficulties whereas in the second month behavioural issues developed additionally. Peer support had little effect on the type of problem women reported (see Table 20). The only significant difference between the groups were more women in the peer group experienced engorged breasts, the baby spitting up at 4 weeks, and the baby being fussy at the breast at 8 weeks postpartum. Furthermore, peer support had no effect on the mean number of problems experienced by the mothers (Table 21).

Table 21

T-Tests of Mean Number of Problem Scores by Groups

Time	Group (n)	Overall Baby Problems				Overall Maternal Problems				Overall Total Problems			
		X	SD	t (*df*)	p	X	SD	t (*df*)	p	X	SD	t (*df*)	p
4wk	Peer (132)	5.68	2.87	1.14 (249)	ns	6.07	3.01	-.36 (242)	ns	12.17	5.21	.25 (242)	ns
	Control (122)	5.26	2.98			6.21	3.43			11.99	5.91		
8wk	Peer (122)	3.01	2.33	1.20 (219)	ns	3.31	2.56	-.64 (205)	ns	6.57	4.32	-.05 (212)	ns
	Control (104)	2.63	2.32			3.55	2.96			6.60	4.69		
12wk	Peer (112)	1.40	1.43	-.33 (184)	ns	2.15	2.28	-.69 (187)	ns	3.71	3.60	-.70 (194)	ns
	Control (93)	1.47	1.64			2.39	2.53			4.06	3.70		

Social Support and Health Service Utilization

Fifty-five percent of mothers (n = 139) talked to someone regularly about breastfeeding with the most common person being a family member or friend (58.3%). Significantly more mothers in the peer group were talking to someone regularly than mothers in the control group [χ^2 (1, n = 254) = 8.81, p = .003]; this finding provides further indication that new mothers in the peer group were talking to their peer volunteers. In addition, the majority of mothers also received assistance from the baby's father. Through the provision of instrumental (48.8%), emotional (24.6%) and appraisal (20.1%) support, 97% of mothers (n = 254) responded that the baby's father was supportive of their

breastfeeding. No significant difference in partner support was found between the groups [χ^2 (1, N = 254) = .24, p = .62]. Furthermore, only 13.1% (n = 33) of mothers reported that someone was not supportive about their breastfeeding. The most common source of nonsupportive interactions came from family members (n = 20); the most frequent nonsupportive interaction was a comment "to give a bottle of formula to make sure the baby was getting enough" (n = 15). No significant differences were found between the groups [χ^2 (1, N = 251) = 2.94, p = .09].

First Postpartum Month

During the first 4 weeks, 89.9% (N = 228) of mothers received help with their breastfeeding problems. Mothers in both groups equally sought out help [χ^2 (1, N = 254) = 1.08, p = .30]. Hospital breastfeeding clinics were used by more that half of the participants (59.8%) followed by family physicians (41.7%), family members (38.2%), books (29.1%), partners (24.0%), friends (23.6%), hospital phone line (23.2%), pediatricians (7.9%), and the public health department (7.5%) (see Appendix Z). La Leche League was only used by four mothers (1.3%). Only one significant difference was found between the two groups--more mothers in the control group used friends for help than mothers in the peer group [χ^2 (1, N = 254) = 12.97, p < .001]. While many mothers used a myriad of breastfeeding services to help them with their breastfeeding problems or concerns, social networks were used with greater intensity. On average, mothers who sought out help used professional services and books between four to five times per month (X = 4.68, SD = 1.43 and X = 4.66, SD = 7.57 respectively) while they relied on social networks an average of 15 times per month (X = 15.21, SD = 4.25). Furthermore, mothers were more likely to have used professional services for a specific problem i.e. baby concern, while social networks were more likely to be used for a general problem; a general problem was coded when a mother used a support for a wide array of concerns with no specific focus.

Second Postpartum Month

Two-hundred and twenty-six mothers continued to breastfeed into the second postpartum month and responded to questions at 8 weeks. Breastfeeding problems, while decreasing, remained a concern for many mothers and 60% (n = 136) sought out help. Again, no significant differences between the groups were found [χ^2 (1, N = 224) =2.78, p = .09]. Breastfeeding clinics were not as readily used as in the first month; only 20.4% of mothers employed this specific health service. The more frequently used sources of support were family physicians (28.3%) and family members (23.5%) followed by books (13.3%), friends (12.4%), partner (12.4%), hospital phone line (6.6%), and pediatrician (4.4%) (see Appendix AA). For mothers who sought out help, social networks continued to be used with greater intensity (X = 10.75, SD = 7.89) in comparison to professional services (X = 1.18, SD =0.50) or books (X = 2.43, SD = 6.89).

Third Postpartum Month

Of the 205 mothers who completed the 12 week breastfeeding questionnaire, 39% (n = 80) sought out help for their breastfeeding problems or concerns. Mothers in the control group did not seek out help any more readily than mother in the peer group [χ^2 (1, N = 203) = 1.13, p = .29]. The most frequently used source of support were family physician (14.6%), family members (13.2%), books (11.2%), friends (12.7%), breastfeeding clinic (7.8%), partner (7.8%), pediatrician (2.9%), and hospital phone line (2.0%) (see Appendix BB). Significantly more mothers in the control group visited the breastfeeding clinic than mothers in the peer group [χ^2 (1, N = 205) = 6.15, p = .01]. Similar to the second month postpartum, for mothers who sought out help social networks continued to be used with greater intensity (X = 10.34, SD = 6.68) in comparison to professional services (X = 1.06, SD = .21) or books (X = 2.23, SD = 4.77).

Maternal Perception of Peer Support

The majority of the 130 participants who received the peer support intervention, and completed the Perception of Peer Support Questionnaire (PPSQ) (Appendix E), were satisfied with their experience. The mean score on the PPSQ was negatively skewed at 43.56 (SD = 7.83) with a minimum of 10 and a maximum of 50 (score range from 10 to 50). In particular, 62% of mothers were very satisfied, 19% were satisfied, 11.5% were unsure, and 6.9% were unsatisfied. Furthermore, 85% of mothers (n = 110) stated they would have a peer again if they could repeat their experience. Of these 110 participants, 20% indicated they found the volunteer to be generally helpful and supportive while other mothers specifically indicated an aspects of the peer volunteer interactions that they had a heightened value for such as informational (18.1%) (e.g. "she provided me with helpful information"), appraisal (6.3%) (e.g. "I felt I was doing fine after talking to her"), and emotional (3.1%) (e.g. "I liked her listening to me and my issues") support. In addition, 14% of the mothers liked the idea that they could "talk to an experienced mom" while 9.4% were glad to know that there was "someone there if I required help." Seven percent of mothers felt peer support was particularly helpful if a new mother did "not have family or friends nearby" and 7.9% of mother enjoyed the objectivity of the peer volunteer (e.g. "she was neutral since she was not a friend or family member"). Of the 19 mothers (14.6%) who would prefer not to receive peer support again, 11 (8.5%) indicated they already "had enough support" while only three mothers (2.3%) were dissatisfied with the support received; five mothers gave unrelated responses. All 130 participants felt that every new mother should be offered peer support.

While 70.5% of mothers did not feel the peer volunteer had an effect on how long they breastfed and half of these mothers (n = 44) indicated that they predetermined how long they would breastfeed, 20 mothers described how their peer volunteer helped them to "persevere" (see Table 25). Fifteen mothers (11.5%) indicated they had a limited relationship with their peer volunteer, and

Table 25

Mothers' Perceptions About Effect of Peer Volunteer on Breastfeeding Duration

Did your peer have an effect on how long you breastfed? (N = 129)	n	(%)
Yes	38	29.5
helped persevere	20	15.5
appraisal support	7	5.4
emotional support	6	4.7
informational support	4	3.1
instrumental support	1	0.8
No	91	70.5
Predetermined	44	34.1
limited relationship	15	11.6
did it myself	11	8.5
had no problems	10	7.8
other	11	8.5

thus, the peer volunteer could not have had an effect on their breastfeeding. To these women a limited relationship was when the peer volunteer: (1) did not telephone, (2) only left a message with her phone number, (3) only telephoned once, or (4) may have telephoned repeatedly but they spoke only a couple of times. Eighty-three percent of mothers (n = 107) felt they had enough contact with their peer volunteer to help them with breastfeeding and 76% (n = 99) were able to speak with their peer volunteer when they experienced problems; 11 mothers did not experience any breastfeeding problems and, therefore, did not need to speak to their peer volunteer (e.g. "I didn't have any problems so I didn't need to call her"). Only 38.5% of mothers (n = 50) contacted their peer volunteer when they had difficulties; however, 20.8% (n = 27) stated they did not have to contact their volunteer since they knew she would be contacting them (e.g. "I knew she was going to call me in a couple of days so I didn't bother calling her"). Sixty-five percent of mothers (n = 82) felt their peer volunteers helped them reach their breastfeeding goals while 14% did not have any difficulties and, therefore, did not need help to reach their goals; 13.4% (n = 17) of mothers did not feel their peer volunteers helped them reach their goals because they had a limited relationship. Overall, 75.4% of mothers (n = 98) responded there was "nothing" they would have liked their peer volunteers to do differently while five mothers indicated they would have

liked to have met their peer volunteers. Eighteen mothers would have liked their peer volunteers to telephone "more frequently" and seven mothers did not like a specific aspect of their peer volunteer (e.g. "she talked too much"). As a whole, the majority of mothers were satisfied with their peer experience (Table 26).

Table 26

Summary of Perception of Peer Support Questionnaire Responses

Perception of Peer Support Question	Mothers' Response (N = 129) Yes (%)	No (%)
11. If you could do it over again, would you have a volunteer?	85	15
12. Did your volunteer help you reach your breastfeeding goals/expectations?	65	35
13. Do you think your volunteer had an effect on how long you breastfed?	29.5	70.5
14. Do you feel you had enough contact with your volunteer to help you with breastfeeding?	83	17
15. Were you able to speak to your volunteer at the time you experienced problems?	76	24
16. Did you contact your volunteer when you had a problem or question?	38.5	61.5
17. Do you think all new breastfeeding mothers should be offered a volunteer?	100	0

Peer Volunteer Activity

Peer Volunteer Perceptions

Responses on the 78 returned " Peer Volunteer Activity Logs" (out of a potential of 132) indicated that the peer volunteers felt they were helpful 84.3% of the time. When the peers explained why they felt helpful, their descriptions suggested the following overall composition of their interactions: informational (53.5%), emotional (23.4%), appraisal (19%), and instrumental (4.1%) support. Examples of instrumental support included photocopying of breastfeeding material and the lending of breast pumps and books. The most common reason cited for unhelpful feelings were in relation to the mother not experiencing any breastfeeding problems or concerns, and thus, not requiring support. In addition to these unhelpful feelings, two peers described being hurt when their telephone calls were not returned by the matched new mothers. When this issue was brought to the attention of the volunteer coordinator, she validated this finding by stating that a few other peer volunteers had made similar comments to her.

Relationship Between Peer Volunteer Activity and Maternal Outcomes

Peer volunteers' activities, based on the peer volunteer activity logs (Appendix F), were assessed in relation to infant feeding category, breastfeeding problems and concerns, maternal satisfaction with infant feeding, and maternal perceptions of peer support. Peer volunteer activities incorporated into the analysis included the following: (1) number of days mother home from hospital before first peer contact, (2) number of peer overall contacts (connections and attempts), (3) number of peer overall connections (actual interaction with mother), (4) number of peer overall attempts (tried to interact with mother), (5) number of peer contacts during first postpartum week, (6) number of peer contacts during second postpartum week, (7) number of peer contacts during first postpartum month, (8) number of peer contact during second postpartum months, (9) number of peer contacts during third postpartum month, and (10) number of days peer/mother relationship continued. Correlations showed that these preceding peer volunteer activities, with the 78 mothers in the experimental group, were not significantly related to infant feeding category at 4, 8, or 12 weeks (see Appendix CC). Furthermore, peer volunteer activities were not related to maternal satisfaction with infant feeding (see Appendix DD). However, maternal perceptions of peer support were weakly to moderately correlated to peer volunteer activities. In particular, the overall number of peer volunteer contacts ($r_s = .34$, $p = .002$) and connections ($r_s = .43$, $p < .001$), total number of contacts during the second ($r_s = .29$, $p = .01$) and third ($r_s = .25$, $p = .03$) months, and length of the peer/mother relationship continued ($r_s = .24$, $p = .03$) were all positively correlated to mothers' evaluations of their peer support experiences. Mothers' perceptions were not correlated to the timing of first initial contact, number of peer attempts to connect, nor the number of contacts in the first month (see Appendix DD). Finally, peer volunteer activities were not related to the number of problems or concerns mothers experienced during the first 3 months postpartum (Appendix EE).

Additional Analyses

Additional analyses were conducted to determine the variables associated with and predictive of the continuation of breastfeeding. Pearson chi-square tests were calculated between breastfeeding and bottlefeeding participants at 3 months postpartum. Any significant variables from this analysis, from which the data were collected before randomization, were entered into a logistic regression model to determine their predictive value.

Factors Associated with Breastfeeding Duration

Maternal characteristics. Several maternal demographic differences were found between those mothers who were breastfeeding at 12 weeks postpartum and those mothers who had discontinued. Breastfeeding continuation was associated with older age [χ^2 (1, N = 256) = 8.42, p = .003], higher household income [χ^2 (1, N = 240) = 7.51, p = .006], higher level of education [χ^2 (1, N = 256) = 4.19, p = .04], marriage/common-law status [χ^2 (1, N = 256) = 18.03, p < .001], not smoking before [χ^2 (1, N = 256) = 8.24, p = .004] or during [χ^2 (1, N = 256) = 9.15, p = .002] pregnancy, deciding to breastfeed before pregnancy [χ^2 (1, N = 256) = 8.84, p < .003], attending both prenatal [χ^2 (1, N = 256) = 7.40, p = .006] and breastfeeding [χ^2 (1, N = 256) = 5.07, p = .02] classes, and having a close family member/friend who had previous breastfeeding experience [χ^2 (1, N = 256) = 4.19, p = .04]. Ethnicity [χ^2 (1, N = 256) = .00, p = .95], place of birth [χ^2 (1, N = 256) = .16, p = .68], breastfeeding duration intention [χ^2 (1, N = 256) = 2.88, p = .09], and whether the mother was breastfed as a baby [χ^2 (2, N = 256) = 4.24, p = .12] were not significantly related to the continuation of breastfeeding.

Delivery and hospital characteristics. Breastfeeding at 12 weeks postpartum was not associated with delivery analgesia [χ^2 (5, N = 255) = 5.68, p = .34], mode of delivery [χ^2 (4, N = 256) = 4.30, p = .37], perineum status [χ^2 (5, N = 255) = 3.40, p = .84], admission to Special Care Nursery (SCN) [χ^2 (1, N = 250) = .00, p = .95], or infant supplementation [χ^2 (1, N = 256) = 1.16, p

= .28]. However, women were more likely to discontinue breastfeeding if they experienced any maternal complications [χ^2 (1, N = 250) = 6.20, p = .01], perceived they had serious breastfeeding difficulties in hospital [χ^2 (1, N = 250) = 10.98, p = < .001], or were seen by the hospital lactation consultant before discharge [χ^2 (1, N = 250) = 4.61, p = .03].

Postpartum support. Breastfeeding at 12 weeks postpartum was not associated with talking to someone regularly about breastfeeding [χ^2 (1, N = 254) = .35, p = .56], having a non-supportive person in their life [χ^2 (1, N = 251) = .64, p = .42], nor seeking help for any breastfeeding problems [χ^2 (1, N = 254) = .04, p = .83]. Furthermore, the continuation of breastfeeding was not associated with the use of professional health services, such as the breastfeeding clinic, hospital phone line, public health department, pediatrician, community lactation consultant, or midwife, nor lay support such as family members, partners, friends, La Leche League, or the use of books. However, a visit to a family physician within the first 8 weeks postpartum [χ^2 (1, N = 226) = 12.62, p < .001] and a home visit by a health care professional [χ^2 (1, N = 250) = 13.40, p < .001] were both associated with the discontinuation of breastfeeding.

Predicting Breastfeeding Duration

In preparation for logistic regression analysis, to ascertain which variables predicted the duration of breastfeeding at 3 months postpartum, the following steps were taken. Maternal/hospital/postpartum variables from the preceding analyses which had significant differences between mothers who continued and discontinued breastfeeding at 3 months were identified to be potentially important predictors and were recoded to be included in the logistic regression model (see Table 30). Response categories for the predictor variables were collapsed as follows: mother's age (≤ 24, over 24), education completed (≤ high school, > high school), marital status (single, married/common-law), income (< $40,000, ≥ $40,000), smoked before pregnancy (yes, no), smoked during pregnancy (yes, no), decision to breastfeed (before pregnancy, during pregnancy), prenatal class attendance (yes, no), breastfeeding class attendance (yes, no),

family/friend with previous breastfeeding experience (yes, no), and trial group allocation (peer, control). The outcome variable was any breastfeeding at 3 months postpartum (yes, no). To create these two categorical variables, a coding scheme of "0" and "1" was used with the code of 1 indicating that the poorer outcome was present.

Table 30

Variables Significantly Associated with Breastfeeding at 3 Months Postpartum

	Variables	N	χ^2	p
1	Maternal age	256	8.42	.003
2	Maternal education	256	4.19	.04
3	Marital status	256	18.03	.001
4	Income	240	7.51	.006
5	Smoking status before pregnancy	256	8.24	.004
6	Smoking status during pregnancy	256	9.15	.002
7	Decision to breastfeed	256	8.84	.003
8	Prenatal class attendance	256	7.40	.006
9	Prenatal breastfeeding class attendance	256	5.07	.02
10	Family/friend with breastfeeding experience	256	4.19	.04
11	Trial group allocation	256	6.67	.01

Following the identification process, these variables were assessed for interactions. Chi-square analysis suggested several significant interactions between model variables (see Table 31). To promote ease of interpretability and parsimony, the variable with the most significant associations (maternal age) was used to generate six two-way interaction terms.

Table 31

Associations Between Model Variables and Maternal Age

Variables	Maternal Age (< 24 years, >24 years)				
	N	χ^2	p	OR	95%CI
education (≤ high school, > high school)	256	45.36	.001	11.31	5.04 - 25.41
marital status (single, married/common law)	256	94.70	.001	57.44	17.46 - 188.92
smoke before pregnancy (yes, no)	256	21.76	.001	5.27	2.49 - 11.11
smoke during pregnancy (yes, no)	256	12.01	.001	3.76	1.71 - 8.26
decision to breastfeed (before or after pregnancy)	256	18.75	.001	4.80	2.26 - 10.24
prenatal class attendance (yes, no)	256	12.22	.001	5.50	1.68 - 7.27

Using the significance level of the score statistic with a chosen cutoff value of 0.05 as the entry criteria and the significance level for the Wald statistic with the chosen cutoff value of 0.1 as the removal criteria, a forward stepwise selection was conducted. Using this process, the initial model contained only the constant. At each step, the variable with the smallest significance level for the score statistic, provided it was less than the chosen cutoff value of 0.05, was entered into the model. All variables in the forward step block that were entered were then examined to see if they met removal criteria. The Wald statistics for all variables in the model were examined and any variable with a significance level for the Wald statistic greater that 0.1 was removed from the model. If no variable met the removal criteria, the next eligible variable was entered into the model. This process continued until no variables met entry or removal criteria. Through this process, four variables were identified as significant predictors of breastfeeding at 3 months postpartum (Table 32).

Table 32

Variables in Regression Equation

Variables	Wald	p	OR
Marital status	12.57	.001	6.14
Group allocation	7.44	.006	2.40
Breastfeeding class attendance	5.16	.02	3.66
Family/friend with breastfeeding experience	4.75	.03	3.08

Seven variables and six interaction terms were not retained in the final model (see Appendix FF). The final model was significant based on the overall chi-square for model fit [χ^2 (4, N = 234) = 29.50, $p < .001$] and a non-significant residual chi-square [χ^2 (13, N = 234) = 12.17, p = .51]. To confirm the strength of this model, additional analyses using forward stepwise selection with the likelihood-ratio criteria and backward stepwise selection with the Wald and likelihood-ratio criteria produced similar results. Furthermore, all non-significant variables were individually entered into the model and their significance assessed. The slight to moderate changes in the variables' significance confirmed the accuracy of the model (see Appendix GG).

Summary of Results

While the majority of mothers, independent of group allocation, continued to breastfeed through out the trial, the positive effect of peer support on breastfeeding duration among primiparous women was unequivocal. Significantly more mothers in the peer group were breastfeeding at 4, 8, and 12 weeks postpartum. Furthermore, these women were practicing a higher level of breastfeeding with significantly more exclusively breastfeeding at 4 and 12 weeks postpartum. No differences between groups were found in relation to supplementation and discontinuation of breastfeeding rationales. Of the mothers who discontinued breastfeeding or initiated supplementation, the most common reason cited was insufficient milk supply. Not surprising, all mothers experienced difficulties through the 3 month period. However, maternal affective concerns were an issue for a large number of women as half of these mothers reported feeling sad and tearful in the first 4 weeks and the majority of mothers experienced fatigue, especially in the initial 2 months. There were no significant differences between groups in relation to type and number of problems reported except that significantly more women in the peer group experienced engorged breasts, the infant spitting-up, and infant fussiness at the breast. To overcome these difficulties, the majority of all women sought help, especially in the first postpartum month. The only significant difference between the groups in relation to breastfeeding support utilization was that more women in the control group talked to friends in the first month and visited the breastfeeding clinic in the third month. In relation to maternal satisfaction with infant feeding method, most mothers were satisfied with how they fed their infant and no significant differences were found between the groups on MSIFQ scores. However, significantly more mothers in the peer group were satisfied with their overall infant feeding method. Additionally, significantly more mothers in the peer group stated they would breastfeed their next baby the same way as their first, while significantly more mothers in the control group stated they would breastfeed again but do so differently.

The majority of mothers (85%) who received peer support were satisfied with their peer volunteer experience and would accept peer support again; all mothers felt peer support should be offered to every new mother. While only one third of mothers felt that peer support had an effect on how long they breastfed, 65% felt the peer volunteer helped them reach their breastfeeding expectations. This may be related to the fact that 76% of mothers were able to speak to their peer volunteer at the time they experienced problems and 83% felt they had sufficient contact with their peer volunteer. Finally, peer volunteer activities were not related to infant feeding category, maternal satisfaction, nor the number and type of breastfeeding problems reported. However, the more a peer volunteer contacted and connected with a mother the more positively the mother perceived the peer support experience.

CHAPTER IV

DISCUSSION

In this chapter, trial limitations and strengths will be presented followed by a discussion of the main study results. Based on the Breastfeeding Peer Support Model, the structural, functional, and interactional aspects of breastfeeding peer support will be delineated to promote an enhanced understanding of the peer support construct and the potential mechanisms underpinning the intervention.

Limitations

This trial has several limitations. First, generalizability of the findings are limited due to the homogeneous sample and the small geographic area used for recruitment. Thus, the effect of peer support on breastfeeding duration among low-income, young, or immigrant women is still unknown, as is the effect in rural areas or communities with limited professional health services. Second, self-report was used to obtain outcome data. Although researchers have documented a high level of accuracy of self-reports for infant feeding practices (Launer et al., 1992; Quandt, 1987), there may have been some under-reporting of the use of non-human milk by study participants since preventive health behaviours tend to be over estimated by self-report measures (Bowman, Redman, Dickinson, Gibberd. & Sanson-Fisher, 1991). Third, reliable and valid instruments were not available to measure the trial variables, thus, all questionnaires were developed specifically for this study. While attempts were made to establish content and construct validity, there was limited psychometric testing of the instruments pre-trial initiation. Finally, there is an increased risk of Type I error due to multiple statistical analyses with an alpha set at .05. However, this is the first randomized controlled trial in this specific clinical area; thus, the relationships and differences between variables required exploration. As such, no broad generalizations resulting from this trial will be suggested.

Strengths

Efforts were undertaken to ensure the methodological rigour of the study. Statistical conclusion validity was achieved through the increase of statistical power to 90% to prevent a Type II error and a power analysis was conducted to determine the sample size. To promote consistency in data collection, only one research assistant participated in the compilation of data. Furthermore, data were collected in a very consistent and systematic fashion: (1) the research assistant was trained in data collection, (2) an algorithm was developed to ensure uniformity in determining infant feeding patterns, and (3) a clearly delineated time schedule ensured appropriate data collection intervals. To prevent bias in the data collection process, the research assistant was blinded to participant group allocation. Furthermore, to ensure consistency in the recruitment process, only one individual recruited all the trial participants at both sites. To decrease selection bias and to control for confounding variables, all participants were randomized using consecutively numbered, sealed, opaque envelopes constructed by a biostatistician not involved in the recruitment process. Randomization occurred after consent and baseline data were obtained and with the participant present: an audit trail was available and no violations occurred to the randomization process. Additionally, no differences were found between participants who enrolled in the trial and non-randomized eligible mothers, thus increasing the generalizability of the trial to this specific population. Furthermore, this trial experienced a low attrition rate (0.78%) as only two mothers out of 258 participants were lost to follow-up. Diffusion of the intervention was controlled both at the hospital and community levels; this effort resulted in only one mother in the control group receiving the intervention and all mothers in the experimental group were matched with a trial peer volunteer.

Content analysis was conducted on all open-ended questions by two individuals and compared for consistency; a category congruence rate of 90% was achieved. Furthermore, to ensure coding schemes were being uniformly applied, inter-coder reliability was assessed resulting in an 87% agreement. Double data entry was conducted by two independent individuals and

inconsistencies between the data sets were checked through a SPSS program. Any discrepancies were examined with the original data. Finally, all participants remained in their randomized group assignment for data analysis.

Major Findings

The majority of the mothers who participated in this trial were older, married, middle-class, Caucasian women who had completed post-secondary education, decided to breastfeed before pregnancy, attended prenatal classes, and did not smoke. These characteristics are not representative of a high-risk breastfeeding population, but rather, they have been associated repeatedly with increased breastfeeding duration rates (Janke, 1993). Therefore, it was not unusual to find that the majority of mothers in this trial continued some level of breastfeeding to 3 months postpartum. However, it noteworthy to mention that the breastfeeding initiation rate at the trial recruitment sites was only 70% which is significantly lower than the 83% found in a Toronto study (Barber et al., 1997), 86.6% found by the North York Public Health Department (1994), and 77% found by the Halton Health Department in the recruitment area (Halton Health Department, 1993). The decrease in breastfeeding initiation may reflect a similar secular trend that has been reported during the last decade in the United States (Brent et al., 1995). However, the primary outcome for this study was breastfeeding duration, and the significant breastfeeding differences favouring the experimental group at 3 months postpartum, and at all other time periods, are important findings. In this trial, 81% mothers who received peer support were breastfeeding at 3 months postpartum, in comparison to 67% of mothers without peer support in the control group and the rates in the following descriptive studies: 72% found by Barber et al. (1997), 72% found by the North York Public Health Department (1994), and 70% found by the Halton Health Department (Halton Health Department, 1993). Thus, mothers in this trial who received peer support had approximately a 10% increase in breastfeeding at 3 months postpartum in comparison to other mothers in the same geographic area. Furthermore,

while a meta-analysis of 13 trials (Sidorski & Renfrew, 1999) found that interventions based primarily on professional support (12 trial were interventions with professionals) showed a clear beneficial effect only until 2 months postpartum, this study would suggest that peer support may have a more enduring effect on breastfeeding duration than professional support alone. How much longer is still unknown since this trial ended at 3 months postpartum. All of these preceding findings indicate that the major result in this trial, that peer support significantly increased breastfeeding duration at 3 months postpartum, is an important clinical finding that warrants further research.

The extent to which this intervention increased breastfeeding duration is due to a peer support effect or is a result of social monitoring through regular phone calls about infant feeding is unknown. However, what is known is that 30% of the mothers, who received the peer support intervention and completed the PPSQ questionnaire, indicated that their peer volunteer had an effect on how long they breastfed, and 16% of these mothers specifically reported that their peer volunteer had helped them "persevere" through the difficult times. In qualitative studies, perseverance has been shown repeatedly to be important variable in the continuation of breastfeeding (Bottoroff, 1990; Locklin, 1995; Locklin & Naber, 1993).

The frequency and occurrence of peer volunteer interactions were not associated with the infant feeding category at 4, 8, and 12 weeks postpartum. This result may indicate that a standardized peer support intervention is not essential to the continuation of breastfeeding but rather it is the quality of the support that is fundamental. Thus, individualizing the support to meet the mother's needs may be essential. This finding is congruent to that of Blazer (1982) who also did not find frequency of interactions to having a net effect, but rather it was perceived adequacy of support that had the desired outcome. Similarly, Israel (1985) found that it is the quality not the quantity of social interactions and relationships that is most strongly associated with physical and psychological well-being. Another explanation for this finding may be that it was not the actual receipt of peer support that increased breastfeeding duration but the perception that a peer volunteer would be

available to help if necessary that was the active ingredient. Research has indicated that the perception of support has a stronger influence on specific health outcomes than the enactment of support (Wethington & Kessler, 1986).

While the frequency and occurrence of peer volunteer contacts were not associated with breastfeeding duration, it was significantly and positively related to the mothers' perceptions of peer support. Furthermore, the longer the relationship continued, the more positively the mother perceived the peer experience. The few mothers who were dissatisfied with peer support reported most frequently that their discontentment was due to a limited relationship (the peer volunteer *did not* telephone). Thus, while peer volunteer interactions were not associated with breastfeeding duration rates, the quantity of contacts may have been an indirect measure of the quality (or lack thereof) of the peer-mother relationship. It is noteworthy to mention that the quality of the dyad relationship, and thus mothers' perceptions of their peer support experience, may possibly be enhanced through a more sensitive matching criteria other than residency. For example, one mother was very excited to be paired with an experienced mother who shared the same ethnic background. There were also comments made by the volunteer coordinator that she tried to match new mothers based on age since this was "successful in the past." As such, it would be fruitful to further investigate the importance of dyad matching from a social comparison perspective.

Although significantly more mothers in the peer support group were exclusively breastfeeding at 4 and 12 weeks postpartum (a finding supported by Kistin et al., 1994), the clinical usefulness of distinguishing between the infant feeding categories of exclusive, almost exclusive, and high breastfeeding is questionable. While these categories are widely accepted and a useful way to standardize breastfeeding behaviours (Labbok & Krasovec, 1990), the importance between these categories for infants' and mothers' health is unknown and poses a problem for interpretation. When these categories were collapsed into complete (primarily breastfeeding) and incomplete (primarily bottlefeeding with non-human milk) subcategories to aid clinical interpretation, a similar pattern

across time periods favouring the peer group was found, even though no significant difference existed between the groups beyond 4 weeks postpartum. Therefore, it appears that peer support encouraged women to persevere through difficulties and continue to breastfeed until 3 months postpartum, but it did not significantly deter mothers from supplementing with non-human milk after the initial 4 weeks.

Peer support also had no significant effect on the number of problems reported by participants. It is noteworthy to mention that many of the problems reported could be classified as maternal problem and not just difficulties specifically related to breastfeeding (e.g. fatigue, sadness, and feeling tied down). While the frequency and intensity of the problems experienced was not collected, and thus a limitation with this research finding, mothers in the peer group reported just as many individual problems as mothers in the control group. However, according to Cohen and Syme (1985), symptom/problem reporting is influenced by a variety of physiological, personality, social, and cultural factors and research has indicated that talking with a confidant increases the likelihood of reporting problems (Cohen & Wills, 1984). Thus, mothers who received peer support may have experienced an heightened awareness of their problems through communications with their peer volunteers, and therefore, were more likely to report them to the trial research assistant.

Another explanation for this research finding may be that peer support did not have a *direct* effect on the number of problems experienced but rather the peer volunteers had either a *moderating* effect, by helping mothers to cope more effectively with their difficulties, or a *mediating* effect, by increasing mothers' self-efficacy such that they were better able to persevere when confronted with difficulties. Furthermore, Wills (1985) suggests that conversations with a confidant may demonstrate to an individual that their specific problems are shared by similar others, and perhaps, are relatively frequent in their population which, according to attribution theory (where it is called consensus information), should decrease the perceived severity and threat value of the stressor or problem. This moderating and/or mediating effect explanation, rather than a direct effect interpretation, is a viable

possibility since significantly more mothers in the peer group continued to breastfeed even though they reported just as many problems as mothers in the control group.

Most of the trial participants reported they were satisfied with their infant feeding method and would recommend breastfeeding to their friends. However, in this trial the majority of mothers continued to breastfeed and a common reason for dissatisfaction was premature discontinuation of breastfeeding, a finding congruent with the results of Rogers, Morris, and Taper (1987). While most participants reported they would breastfeed their next infant, 30% of mothers indicated they would do so differently. However, significantly more mothers in the peer group reported they would breastfeed their next infant the *same way* as their first infant, whereas significantly more mothers in the control groups would breastfeed their next infant *differently*. This is an important finding since it suggests that while the majority of mothers were satisfied with their experience, mothers in the peer group were more likely to evaluated themselves and their breastfeeding experience positively. One explanation for this result may be that through the provision of informational and appraisal support, the peer volunteers confirmed with mothers the normalcy of their breastfeeding experience (Sanders, 1982), or through emotional support and anticipatory guidance mothers were better able to cope with their breastfeeding difficulties (Bandura, 1986).

Breastfeeding Peer Support Model

To promote an enhanced understanding of the peer support construct and the potential mechanisms underpinning the intervention, this section, based on the Breastfeeding Peer Support Model, will discuss (1) the structural aspects of breastfeeding peer support including sources of support and disposition, (2) the specific type of peer support functions, and (3) the nature of peer volunteer interactions, including the positive and negative dimensions of peer support and the possible relationships between the underlying peer support mechanisms and the trial outcomes.

Structural Aspects of Breastfeeding Peer Support

Sources of support. In this trial, embedded social network members, health care professions, and peer volunteers complemented each other, providing mothers with a wide array of support sources. From both the formal and informal sectors of care, sources of support additional to peer volunteers will be discussed.

Within the formal health care sector, professional health services were used both in hospital and community settings. Most mothers had access to hospital professional services for at least 48 hours, as only 13% of mothers went home within 24 hours of birth. Contrary to the recommendations of the Baby Friendly Hospital Initiative (UNICEF, 1992) only one third of mothers initiated breastfeeding within a half-hour of birth and half of the infants received some form of supplementation while in the hospital; these findings are significantly poorer than the results found from the 1993 Canadian Institute of Child Health Survey (Levitt et al., 1996). Also contrary to previous research (Bernard-Bonnin, Stachtchenko, Girard, & Rousseau, 1989), these hospital procedures individually were not associated with a decrease in breastfeeding duration in this sample. However, given these hospital practices were occurring to a large proportion of mothers in the trial, it was not unusual to find that close to 40% of mothers reported that they perceived they had serious breastfeeding problems while in the hospital; this variable was significantly associated with breastfeeding duration. Thus, hospital professionals were not consistently a positive source of support for breastfeeding mothers. This finding is congruent with a survey of 2209 health care professionals which found hospital nurses to have the most negative breastfeeding beliefs of all health care professionals (Barnett, Sienkiewicz, & Roholt, 1995).

Once mothers were discharged into the community, breastfeeding clinics, family physicians, and hospital phone lines were the most frequently used professional services, while pediatricians and the public health department were not as widely utilized. It was not surprising to find that approximately 60% of mothers sought out help from the hospital's breastfeeding clinics since the

certified lactation consultants conducted daily hospital rounds, assisting many of the new mothers before hospital discharge and informing them about the clinic. Of these mothers that used the breastfeeding clinic, 84% felt the lactation consultant was very helpful with their breastfeeding problems. This finding is congruent with a study by Coreil, Bryant, Westover, and Bailey (1995) who found, from 35 focus groups of breastfeeding women, that many mothers perceived certified lactation consultants to: (1) be knowledgeable and competent in providing breastfeeding support, (2) be highly motivated, and (3) bring to the counselling situation valuable experience to draw upon in handling a wide range of lactation problems. Given the preceding results, the finding that assistance from a lactation consultant was significantly associated with breastfeeding duration is not an indicator that the lactation consultants were a negative source of support but rather they were a professional service widely used by many participants, particularly mothers with serious difficulties. Specifically, this finding may be evidence of the referral process between hospital staff nurses and the lactation consultants with in-hospital mothers presenting critical breastfeeding difficulties and/or may be an indicator that mothers who were experiencing serious breastfeeding difficulties sought assistance from a lactation consultant before they finally decided to discontinue breastfeeding.

However, family physicians were not consistently a positive source of support, since advice from family physicians was negatively associated with breastfeeding duration. Although the exact reason for this finding is unknown, eight mothers specifically stated, when they were asked why they initiated supplementation or discontinued breastfeeding, their family physician told them to do so; no other health care professionals were mentioned in this question by mothers in this trial. Furthermore, only 65% of mothers who used family physicians for breastfeeding support found them to be helpful with their breastfeeding difficulty. This finding is not unusual since a Canadian survey of 325 physicians (Burglehaus, Smith, Sheps, & Green, 1997) found that current medical curriculum continues to be inadequate regarding training in breastfeeding. Similarly, Goldstein and Freed (1993) found 67% of family practice residents thought their training in breastfeeding counselling was

insufficient and many reported that they have counselled in situations in which they admitted they were not prepared. Even breastfeeding mothers have noticed this gap in physician training (Coreil et al., 1995).

While the majority of mothers readily sought out help for their breastfeeding difficulties within the first month postpartum, very few mothers received breastfeeding support initiated by health care professionals. Home visits to postpartum mothers used to be a mainstay of public health nursing services, yet a shift in practice from individual to population-based approaches and an increase in fiscal constraints have placed additional demands on public health nursing time. As such, lower-risk mothers no longer receive home visits (Edwards & Sims-Jones, 1997). This explains why only 13% of mothers in the trial received a home visit by a health care professional. The high breastfeeding duration rates found in this trial clearly demonstrate that professional home visits were not required for positive breastfeeding outcomes with this low-risk population. Of the participants who did receive home visits from nurses, the majority were single, young mothers. There is some evidence to suggest that, for high-risk mothers, an intense intervention (e.g. weekly home visits) offered during both the prenatal and postnatal period may impact on perinatal mortality, infant feeding, childhood injuries, emergency visits, and parental coping problems (Ciliska, Haywood, & Thomas, 1996; Combs-Orme, Reis, & Ward, 1985; Olds, Henderson, & Kitzman , 1994; Olds, Henderson, Chamerlin, & Tatelbaum, 1986; Olds & Kitzman, 1990). In contrast, research investigating 'low dose' interventions (those requiring limited health professional involvement, e.g., studies in which fewer than five home or phone visits were made to high-risk mothers during the postpartum period) has shown minimal or no effect on maternal or infant outcomes (Barkauskas, 1983; Ciliska et al., 1996; Combs-Orme et al., 1985; Ghilarducci & McCool, 1993). The nature of the home visits by nurses with the trial's high-risk mothers is unknown; however, results of this study indicated early premature discontinuation of breastfeeding was associated with younger maternal age and being unmarried.

In summary, health care professionals were used by the majority of mothers to assist them with their breastfeeding difficulties. However, the support rendered was not always positive as inhibiting hospital practices and the possible lack of breastfeeding knowledge may have been detrimental to breastfeeding women. To complement the use of professional services, many mothers depended on their own social networks for support.

Since all mothers in this trial initiated breastfeeding, it was not surprising to find most mothers indicated that their partner was supportive of breastfeeding. This finding is congruent with the breastfeeding literature that suggests a positive association between partner support and breastfeeding initiation (Bar-Yam & Darby, 1997; Giugliani et al., 1994). Through the provision of instrumental support (e.g. "bringing the baby to me" or "changing the baby's diaper"), emotional support (e.g. "sitting with me while I breastfed"), and appraisal support (e.g. "he said I was doing a great job") almost all mother indicated that they also *received* positive breastfeeding support from their partner. In addition, family members and friends were apparently an important source of support to these mothers, since many women reported talking with a family member or friend regularly about breastfeeding. However, like professional support, this informal sector was not always a positive source of support; the mother's mother was the most commonly cited source of negative support. Through unsupportive comments such as "give the baby a bottle he's still hungry" and "are you sure he got enough," a mother's confidence was undermined. While very few mothers experienced this form of negative support and it was not associated with a decrease in breastfeeding, this finding is not unusual since the majority of the grandmothers probably had not breastfed their daughters: 20 to 30 years ago breastfeeding initiation rates were at an all time low of approximately 24%. Finally, La Leche League, another form of mother-to-mother support, was not used by most mothers. It is unclear why mothers were not using this source of support, but a study by Houston and Field (1988) found that health care professionals did not refer mothers to this lay group.

Finally, it appears that the informal network was used with greater intensity (the mean number of uses in the first month was 15 times, and in the second month was 11 times), for general and multiple problems, and with more of a mother-problem focus, whereas the formal sector of support was used far less frequently (the mean number of uses in the first month was 4 to 5 times, and in the second month was 1 time) and for a specific issue, generally a baby concern.

Disposition of breastfeeding peer support. Peer support was operationalized through the provision of perceived and received support (Stewart, 1990c). In this trial, mothers gave several indications that their peer volunteers provided them with the belief that they were socially attached (House & Kahn, 1985) and that reliable support was available if necessary. Most mothers reported that they felt they could telephone their peer volunteer in times of trouble, and one quarter of mothers indicated that they never contacted their peer volunteer when they had difficulties because they knew their peer volunteer would contact them. Furthermore, when mothers were asked, through open-ended questions, to explain why they enjoyed their peer support experience, several mothers responded that they liked the "feeling that someone was out there to help" them if they required assistance and other mothers indicated that they welcomed the thought that there was someone with experience to whom they could talk with. As mentioned earlier, this perceived support is important, since studies have demonstrated that the perception that support is available is a more efficacious effect, for mental health, than the actual receipt of support (Wethington & Kessler, 1986). However, the enactment of support is also consequential as all of the mothers reported they experienced breastfeeding difficulties. As such, it was equally important to find that most mothers indicated that they felt they had enough contact with their peer volunteers and were able to speak to them when they had difficulties.

To complement the mother's perception of the enacted support, the peer volunteers themselves gave rich insight into the support they delivered. Based on their activity logs, peer volunteers indicated their desire to initiate support; one-third established contact before the mother

was home and almost another one-third contacted the mother the day she was discharged home. It is noteworthy to mention that the majority of peer volunteers complied with the researcher's request to initiate contact with the mother within 48 hours of hospital discharge. The peer volunteers contacted mothers most frequently during the first two week postpartum and, on average, mothers received the majority of their contacts during the first month postpartum, the time period known to be critical for new breastfeeding mothers (Hill & Aldag, 1991); this pattern is similar to the mothers' use of professional health services in this trial. On average peer volunteers connected with the mothers over five times and attempted to connect (but were unsuccessful) an average of three times during the first 3 months postpartum; of these attempts, most peer volunteers left a message, thus, potentially providing perceived support rather than received support. While the average duration of the peer/mother relationship was 53 days, more than one-third of these connections continued past the 3 months monitored by this trial. Furthermore, the mean duration of the telephone interactions was between 15 to 20 minutes and 12 dyads met face-to-face, indicating that social companionship was developing between some dyads (Wills, 1985). Thus, the peer volunteers in this trial put in a considerable amount of time and effort into supporting these new breastfeeding mothers, suggesting that this dyadic level support intervention (Stewart, 1989a) may not have been "low dose" (Edwards & Sims-Jones, 1997). Furthermore, these results indicate that peer lay support has the potential to provide a more longer-lasting form of assistance in comparison to professional support (Eng & Young, 1992; Levin & Idler, 1981) and gives beginning evidence that more enduring support may help women breastfeed longer, as suggested by Sidorski and Renfrew (1999).

Functional Aspects of Breastfeeding Peer Support

In this trial there was clear evidence of the three types of supportive functions that the peer volunteers provided. According to mothers' reports, 86% of peer volunteers demonstrated concern for their feelings, 89% cared about how breastfeeding was going, 72% established a sense of trust, 88% listened to what they had to say, and 84% made them feel they could call in times of trouble.

Thus, most peer volunteers provided mothers with emotional support. However, peer volunteers rarely highlighted to this type of assistance in their activity logs. This finding is not unusual, according to Staden (1998), who described emotional labour as an invisible but essential part of care.

Not as invisible but just as essential is the appraisal support rendered by peer volunteer, as mothers indicated that 75% of peer volunteers made them feel better after their telephone interactions and 80% increased their confidence to breastfeed. Furthermore, informational support was readily given as mothers reported that 78% of peer volunteers provided them with useful information, 76% gave helpful suggestions to their questions, and 68% told them what to expect in certain situations. These evaluations of the peer support experience clearly demonstrate that most peer volunteers provided mothers with emotional, appraisal, and informational support.

Congruent with the literature on lay helpers (Katz & Bender, 1976) and the peer support concept analysis, instrumental support was not a main component of peer support. However, occasionally it was provided, as peer volunteers went beyond the community breastfeeding program's expectations in order to attend to mothers' individualized needs. For example, one peer volunteer went to a mother's home to "quickly check the baby's latch," several peer volunteers lent their breast pumps, while others photocopied material for the mothers or gave out their breastfeeding books. One peer volunteer eloquently described how she went out and "researched a question" that she was asked, spending time above and beyond her telephone interaction with her mother.

Interactional Aspects of Breastfeeding Peer Support

It is through the preceding functions of emotional, appraisal, and informational support that the mechanisms of peer support were rendered to provide a positive effect on the breastfeeding mother. While the majority of mothers experienced positive effects from the peer volunteers, negative outcomes were also found. These negative outcomes will be described following the delineation of the positive effects of peer support.

Positive effects of peer support. To understand the positive effects of peer support on breastfeeding duration, the specific mechanisms of peer support were reviewed. While these mechanisms were not precisely measured, the results of this trial contributed to some insights as to why the peer support intervention increased breastfeeding duration. From the Breastfeeding Peer Support Model, there are six possible peer support mechanisms: (1) enhancing depleted social networks, (2) promoting help-seeking behaviours, (3) promoting social comparison, (4) increasing self-efficacy, (5) preventing health concerns, and (6) encouraging effective coping. Since many of the theories underpinning these mechanisms are inter-related, four mechanisms will be discussed separately, and the other two (5 -6) will be integrated when appropriate.

Studies have shown that measures of social integration are directly and positively related to mental and physical health (Thoits, 1995). In this trial during the enrollment process, half of the eligible women who declined trial participation did so because they felt they already had enough support. However, other mothers during the enrollment process indicated that they did have family and friends to help them with breastfeeding, but welcomed the opportunity to possibly be matched with an experienced mother in their neighbourhood, just in case they needed extra support. These mothers had their own social network but also wanted access to various forms of support to enhance their own sources of support. Finally, other mothers stated they wanted to participate in the trial because they did not have family members nearby or they had just recently moved to the area. This latter reason for wanting peer support was validated when 7% of mothers in the peer support group stated they felt that being matched with a peer volunteer was good especially for mothers who do not have access to family and friends. Thus, for some mothers in this trial, peer volunteers may have enhanced their social network and provided them with the necessary informal support to assist them in the continuation of breastfeeding, while for other mothers the addition of a peer volunteer supplemented their current network structure and increased their perceived availability of support.

Peer volunteers may have also assisted mothers to breasfeed longer through the promotion of help-seeking behaviours. Gourash (1978) defined help-seeking as any communication about a problem or troublesome event which is directed toward obtaining support, advice, or assistance in a time of distress. Social networks can influence help-seeking values and the use of formal sector services by acting as screening and referral agents (Gourash, 1978; Stewart, 1989c) and they may enhance, complement, or serve as alternatives to professional services (Eng & Young, 1992; Giblin, 1989; Stewart, 1989c). In this trial, peer volunteers assessed their mothers' breastfeeding situation during their telephone contacts and, based on their experiential knowledge, the peers volunteers referred mothers to professional health services if the mother required additional help that she was unable to deliver (e.g., "antibiotic for mastitis") or required a "hands-on" effort (e.g. "getting the baby to latch on properly"). Through the activity logs it was found that almost 10% of peer volunteer interactions were referrals to health care professionals. In particular, one peer volunteer described how she telephoned the hospital breastfeeding clinic a few minutes before it closed and asked the lactation consultant to remain open until the mother arrived. In addition to referring mothers to health care professionals, peer volunteers also contacted a professional on behalf of the mothers to help them with their breastfeeding problems. One peer volunteer nicely described how a mother was having a difficult time and needed extra assistance so she suggested to the mother that she go to see the lactation consultant at the breastfeeding clinic to help answer her complex questions. According to the peer volunteer, the mother was clearly distraught and thought this was a good idea, stating she would consider going after she had a nap. The peer volunteer felt "so bad for the mother" she telephoned the lactation consultant herself and obtained the answer to the mother's question. She "waited a few hours while the mom slept and then telephoned her". Thus, the peer volunteers, through their telephone interactions, assessed their mothers' breastfeeding situations and referred them to professionals if they required additional assistance in continuing to breastfeed.

Developed within Bandura's (1977, 1986) framework of social learning theory, self-efficacy is a cognitive process which refers to individuals' confidence in their perceived ability to regulate their motivation, thought processes, emotional states, and social environment in performing a specific behaviour. Self-efficacy has been shown repeatedly, through correlational and causal association, to be predictive of health behaviours and increases in self-efficacy have been influenced, produced, and sustained in quasi-experimental and experimental studies (Redland & Stuifbergen, 1993). Individuals develop self-efficacy expectancies through four sources of information: performance accomplishments, vicarious experiences, verbal persuasion, and inferences made from one's physiologic and/or affective state (Bandura, 1977).

Based on the information obtained from the PPSQ, peer volunteers may have had a direct effect on mothers' breastfeeding self-efficacy through the development of mothers' sources of information. Through the provision of appraisal support, peer volunteers reinforced breastfeeding activities, thereby positively influencing mothers' performance accomplishments. Most peer volunteers informed mothers of what to expect in certain situations and provided helpful suggestions; thus, peer volunteers provided mothers with vicarious experience and an opportunity for upward social comparisons. These peer volunteer interactions also provided mothers with anticipatory guidance to potentially prevent breastfeeding problems and information on how to improve future breastfeeding performance.

Through emotional support, most mothers indicated that their peer volunteer listened to what they had to say, demonstrated concern for their feelings, and cared about how breastfeeding was going for them. The net effect of these interactions was the acknowledgment of the mothers' current experience which, in turn, made the participants feel better after talking to their peer volunteers. Thus, the peer volunteers positively influenced the mothers' affective state. Finally, self-efficacy is operationalized through the measurement of confidence and most mothers indicated that their peer

volunteer interactions increased their confidence. Albeit a very weak measure of breastfeeding confidence, this result adds further evidence that peer volunteers enhanced mothers' self-efficacy.

According to Bandura (1986), an individual's self-efficacy expectation subsequently influences thoughts and actions through four broad processes: choice in behaviour, the amount of effort expenditure and persistence, thought patterns, and emotional reactions. Collectively, these processes exert a powerful influence over behavioural performance. Thus, through increasing mothers' self-efficacy, peer volunteers may have positively influenced how much effort mothers put into breastfeeding and promoted persistence to overcome difficulties and continue to breastfeed. This is important since mothers in the peer group had just as many breastfeeding problems as mothers in the control group. As mentioned earlier, 16% of mother explicitly stated that their peer volunteer helped them to persevere. Finally, peer volunteers were a coping resource for breastfeeding mothers (Thoits, 1995). Through increasing mothers' self-efficacy, peer volunteers promoted positive emotional reactions by providing problem-solving techniques, through helpful suggestions, while enabling mothers to cope more effectively with their breastfeeding difficulties by proving norms which prescribe adaptive behaviours, through telling mothers what to expect in specific situations.

Given these potential mechanisms and the underlying emotional, appraisal, and informational support that most mothers received, it was not surprising to discover a high satisfaction with this intervention. Most mothers indicated that they were pleased with their peer support experience, would have a peer volunteer if they could do it over again, indicated there was nothing they would have liked their peer volunteer to have done differently, and all of them felt that every new mother should be offered this peer support experience.

Negative effects of peer support. While considerable attention has been given to the positive effects of peer support, negative consequences from these social interventions also exist (Stewart & Tilden, 1995). Although there was no evidence of criticism or reinforcement of poor health

behaviours, information from the PPSQ and anecdotal information indicated that there were indeed other negative outcomes of peer support. Of the 130 mothers who completed the PPSQ, there was a small number ($n = 9$) of participants who indicated they were not satisfied with their peer support experience; most of these mothers would have liked their peer volunteer to have telephoned "more frequently." However, a few mothers responded that they did not like a specific aspect of their peer volunteer. For example, one mother did not telephone her peer volunteer when she had a "quick question" because she felt her peer volunteer "talked too much" and "would keep her on the phone for half an hour." Another mother was very "excited" about being matched with a peer from the same ethnic background. However, the peer volunteer only telephoned her once in the first week and then informed her that she was going on a 2- week vacation and would telephone her when she returned home; the peer volunteer "never called back." Another mother also complained that her peer did not return her telephone calls. Thus, in this trial there were issues of stability with some dyadic relationships.

Even more seriously, one mother requested to discontinue her participation in the intervention when her peer volunteer frightened her about the potential hazards of not breastfeeding. This in turn made "her feel more anxious" and diminished her feelings of confidence, despite the fact that "breastfeeding was going well." Another mother felt her right to confidentiality was violated when her peer volunteer contacted the public health department without her consent. These preceding negative outcomes necessitate attention in the development of future peer support interventions since conflict, failed support attempts, negative interactions, and lack of stability correlate more strongly than positive interactions with decreased perceived support and increased psychological symptoms (Stewart & Tilden, 1995).

There were also pragmatic issues related to the implementation of the peer support intervention. Six mothers lost their peer volunteers' telephone numbers and were, therefore, unable to initiate contact if necessary. This was identified when the research assistant telephoned the

mothers to collect data and they asked the assistant to have their peer volunteers telephone them. An additional pragmatic issue was the moderately high peer volunteer attrition rate (18 peer volunteers out of 58). This resulted in a very time-consuming role for the volunteer coordinator who had to continuously recruit and orient new peer volunteers; this responsibility is in addition to her other volunteer coordinator obligations such as matching all new mothers and providing support to the peer volunteers if they needed extra breastfeeding information or if they had an unsuccessful experience with a mother. From anecdotal information it appeared that the high attrition rate may have been related to unsuccessful support experiences, which provoked feelings of dissatisfaction in some peer volunteers. Therefore, the negative consequences of peer support were not just unidirectional. For example, two peer volunteers had difficulties with conflicting values when they stated it was hard for them to stay neutral when the mothers "introduced solids at 3 months". In addition, several peer volunteers indicated frustration when they could not connect with their mothers and other peer volunteers expressed feelings of "hurt" and "disappointment" when the mothers failed to return their telephone calls. Indeed, over 90% interactions were unidirectional as peer volunteers initiated most of the contacts; however, this low telephone initiation rate by participants is not uncommon with new breastfeeding mothers (Lee, 1997; Lynch, Koch, Hislop, & Coldman, 1986). Furthermore, a few peer volunteers talked about how the mothers did not communicate extensively with them. Thus, these peer volunteers were expressing dissatisfaction due to inhibited communications and unidirectional, non-reciprocal interactions. While these peer volunteers' hurt feelings could be negatively labeled as emotional over-involvement, Jordan, Kaplan, Miller, Stiver, and Surrey (1991) have put forth a relational theory which suggests that women's sense of self does not develop through structures marked by separatedness and autonomy (as traditionally theorized), but rather through increasing empathic responsiveness in the context of personal mutuality. In short, these researchers believe that women grow through relationship and

connection. This may help explain why some peer volunteers felt hurt and disconnected with the mothers in this trial.

Summary of positive and negative effects. The addition of a peer volunteer to a mother's informal network may have increased her perceived support or enhanced a depleted social network. Trial results have also indicated that through peer initiated referrals, the peer volunteers were a mediating link between mothers in the community and health care professionals, thus enhancing mother's help-seeking behaviours. Furthermore, through mother's evaluations of their peer support experience, it appears that the peer volunteers promoted upward social comparisons, provided vicarious experiences, reinforced positive breastfeeding behaviours, influenced mother's affective state thereby promoting effective coping, and normalized mother's breastfeeding experience, thus promoting positive self and breastfeeding experience evaluations. Through these functions, peer volunteers may have increased a mother's self-efficacy as mothers reported they did. By increasing a mother's confidence, the peer volunteers promoted mothers to extend their breastfeeding efforts, persevere through difficulties, and positively evaluate themselves and their experience, all which may have enabled mothers to continue to breastfeed longer. However, negative effects of peer support were also present for both the mothers and peer volunteers; many of these effects could be addressed during the peer volunteer orientation session.

CHAPTER V

SUMMARY, IMPLICATIONS, AND CONCLUSION

Summary

While approximately 80% of Canadian women initiate breastfeeding, most mothers cease before the 6 months recommended by the Canadian Paediatric Society and American Academy of Pediatrics and the 2 years recommended by the World Health Organization. To address this health issue, postpartum breastfeeding support programs have been developed by health care professionals. However, evaluations of such professional support interventions have failed to demonstrate significant improvements in breastfeeding outcomes beyond 2 months postpartum. A growing trend in health care, and postpartum care in particular, is the use of lay support. Five studies have been found evaluating the effectiveness of peer (mother-to-mother) support for breastfeeding women; however, due to methodological limitations, the validity of the mostly positive results are questionable. The purpose of this study was to evaluate the effect of peer support on breastfeeding duration among first-time mothers.

Within a nine month period, 258 primiparous breastfeeding mothers were recruited from two sites and randomly allocated to receive either conventional care or conventional care plus peer support. The acceptance rate for enrollment into the trial was 72%. Peer volunteers, who were mothers experienced at breastfeeding and were members of a community breastfeeding group recruited specifically for this trial, provided telephone support to new mothers generally within 48 hours of hospital discharge and as frequently thereafter as the individual mother wished. Only one contamination between the groups occurred as a mother in the control group received peer support through prenatal enrollment; all mothers in the peer support group were assigned a peer volunteer. Between 58 peer volunteers and 132 mothers in the peer group, 78 peer volunteer activity logs were returned. From these logs, 637 contacts occurred between they dyads (411 connections and 223 attempted connections). The majority of contacts were telephone interactions initiated by the peer

volunteer; however, 12% of dyads met face-to-face and approximately 10% of mothers contacted their peer volunteers. While most dyad contacts occurred within the first month, over one third of the relationships lasted longer than 3 months. Fifty-six interactions (referrals and telephone discussions initiated by peer volunteers) occurred between peer volunteers and health care professionals to aid the new breastfeeding mothers.

Mothers in both groups were telephoned by a blinded research assistant, every four weeks for the first three months postpartum. Only two mothers were completely lost to follow-up, making the total trial sample 256 mothers, 132 in the peer group and 124 in the control group. Double data entry was conducted by two independent individuals and discrepancies between the data sets were checked by a SPSS program. Content analysis of open-ended questions was conducted by the researcher and an independent colleague and inter-coder reliability was 87%. An intent-to-treat approach, which includes all participants as randomized, was used for the primary analysis of data.

The majority of participants were married, Canadian, had completed postseconday education, had an annual household income greater than $40,000, had attended prenatal classes, and were non-smokers. No significant differences were found in the characteristics of participants and eligible non-participants. The primary research question was to determine the effect of peer support on breastfeeding at 3 months postpartum. The result of this question was positive as significantly more mothers in the peer support group continued to breastfeed than the control group at 3 months postpartum and all other time periods. This is an important finding for several reasons. First, the breastfeeding duration rate for women who received peer support is equal to the overall Canadian initiation rate and 10% higher than the recruitment sites' initiation rate. Second, at 3 months postpartum, the breastfeeding rate for mothers who received peer support was approximately 10% higher than other local breastfeeding rates at the same time period. Third, in comparison to a meta-analysis which indicated professional support only helped mothers to breastfed until 2 months postpartum, mothers in this study who received peer support breastfed longer than if mothers only

received professional support. Thus, peer support has a clinically significant effect on breastfeeding duration among primiparous women.

While peer support did not have a significant effect on maternal satisfaction scores on the MSIFQ, significantly more mothers in the peer groups indicated they would breastfeed their next infant the same way as their first child, where as significantly more mothers in the control group indicated they would breastfeeding their next infant differently. This is an important finding since it may indicate peer volunteers positively influence mothers' evaluations of themselves and their breastfeeding experience.

Although more mothers in the peer group were exclusively breastfeeding at 4 and 12 weeks postpartum, when the infant feeding categories exclusive, almost exclusive, and high breastfeeding were combined, peer support had no significant effect on the level of breastfeeding beyond the first 4 weeks postpartum. Furthermore, peer support had no effect on number of breastfeeding problems experienced or the utilization of health services other than significantly more mothers in the control groups used the breastfeeding clinic at 3 months postpartum. Finally the majority of mothers were very satisfied with their peer support experience as most of them would have a peer volunteer again and all of the participants felt every new mother should be offered a peer volunteer to help them with their breastfeeding.

In addition to evaluating the effectiveness of lay support for new breastfeeding mothers, the trial contributed to our understanding of the advantages and disadvantages of using lay helpers to complement professional health care services. Based on the breastfeeding peer support model developed to guide the intervention, a critical review of the results provided a greater understanding of the peer volunteer mechanisms. From this review, it appears that peer support may have: (1) enhanced depleted social networks or provided additional perceived support, (2) promoted help-seeking through referrals and interactions with health care professionals, (3) increased self-efficacy through vicarious experiences, upward social comparisons, and verbal persuasion, (4) promoted

coping through anticipatory guidance and the provision of norms of adaptive behaviours, and (5) aided self-esteem and self-growth through mutuality and connections. All these mechanisms together provided an enhanced understanding why peer support may have helped mothers extend greater effort and persistence with difficulties, and thus, continue to breastfed longer than mothers in the control group.

While there were many positive effects of peer support, there were also several negative outcomes. Some mothers were dissatisfied with peer support due to the lack of telephone contacts, unstable relationships, incongruent peer volunteer attributes, nonsupportive comments, or unconsented actions. Furthermore, peer volunteers also experienced negative outcomes. Peer volunteers expressed concerns about conflicting values and the amount of effort it required to connect with some of the new mothers. In addition, several peer volunteers felt hurt when their mothers did not return their telephone calls or would not communicate openly. While a new relational theory aided to explain why peer volunteers may have felt hurt due to disconnections and the lack of reciprocity, it does not solve these issues inherent to a community breastfeeding volunteer program with new mothers. Thus, while this dyadic level support intervention demonstrated the effectiveness of peer support on breastfeeding duration among primiparous women and contributed to our understanding of peer support mechanisms, there are also negatives issues that must be addressed with future peer volunteer interventions.

Implications for Future Research

There are many research implications from this trial. Since this is one of the first trials evaluating breastfeeding peer support, specific research implications in relation to breastfeeding women will be discussed first. However, empirical investigations of peer support interventions are also relatively new and, therefore, general implications for peer support trials will be delineated and

include the following areas of: (1) the development of the peer support construct, (2) professional and laity interface, and (3) pragmatic issues.

Breastfeeding Peer Support

This trial involved a homogeneous sample of married, middle-income, Caucasian mothers. Future research is required to evaluate the effect of breastfeeding peer support on diverse populations, including high-risk mothers (e.g. young, single, low-income, or immigrant) in various settings (e.g. rural areas or communities with minimal professional support services). Furthermore, this investigation included only primiparous women; future peer support interventions should be evaluated with multiparous women with previous unsuccessful breastfeeding experiences. Outcomes for future investigations should include assessments of the dyadic relationship to determine differences in quality of support received and mothers' perceptions of their peer support experience. Finally, while not specifically related to breastfeeding, more than half of the mothers in this trial reported feeling sad and tearful in the first month postpartum. Depression among new mothers is a significant health problem (Gjerdingen & Chaloner, 1994; Harding; 1989; Misri, Sinclair, & Kuan, 1997; Steiner, 1990) and a Cochrane Review indicates that professional or lay support may reduce postpartum depression (Ray & Hodnett, 1999). Thus, further research is required to assess the possible effect of peer support on the mental health of new mothers.

Development of the Peer Support Construct

Specific theoretical models have not been tested to fully understand the mechanisms underlying peer support. Therefore, studies are needed to explore the nature of peer support and the mechanisms where by it influences specific health outcomes. Subsequently, evaluations of peer support interventions should focus on outcomes such as reduced physical and psychological symptoms, increased self-efficacy, improved morale and functioning, enhanced coping, decreased loneliness, increased self-esteem, impact of help-seeking, reciprocity of supportive interactions, and effects of downward and upward social comparison. Furthermore, longitudinal studies are required

to determine if the intervention gains are maintained. While evaluation of peer support interventions at individual and dyadic levels have recently begun, efforts also need to focus on social, community, and multilevel interventions (Stewart, 1989a).

Additional research should also focus on developing a greater understanding of the context in which peer relationships are formed, maintained, and terminated. According to Vaux and Hamilton (1985) culture determines the extent, composition and content of social relationships, and social support varies across subgroups of the population. Thus, future research is needed to determine the role of culture in the development and maintenance of peer relationships. Furthermore, when working with socially disadvantaged groups, focus groups with the targeted population should be conducted to understand specific issues that may help in the recruitment and matching of peer volunteers, and the implementation of the intervention. Open-ended questions should be included with trials to elicit information on unanticipated side effects, concurrent losses, and unplanned lay interventions (Stewart & Tilden, 1995). In failed supportive attempts, both recipients and providers should be interviewed to provide greater insight to the failure. Moreover, information regarding perceived needs, utilization of support, and barriers to utilization should be elicited from all participants. A greater understanding of reciprocity and its potential role in recipient and provider satisfaction is also required. For example, most research is primarily concerned with the individual considered to be in need, but it would be useful to consider also the consequences of support for the relationship. A few specific questions could be: what are the costs of the support provided, emotional and otherwise, to the provider and what is the impact of these costs on the interaction between the provider and recipient? What happens to the relationship if support is one-sided and lacking in reciprocity? When the same problem occurs repeatedly, is caring replaced with anger; does the provider become frustrated and withhold help from and direct ire toward the recipient? Finally, to address methodological issues, measures need to be developed and psychometrically tested to assess satisfaction with quality as well as the quantity of potential and actual peer support received.

Professional and Lay Interface

Increasingly, self-help/self-care, mutual aid, strengthened social networks, creation of supportive environments, and public participation are lauded as mechanisms for imparting primary health care and health promotion on a widespread basis (Stewart, 1990b). Effective public participation requires that health professionals be knowledgeable about lay support networks, such as peer lay helpers, and willing to participate in a partnership relationship with them. Collaboration and consultation are recurrent themes in the investigations of the professional interface with laity. Thus, future research efforts are required to understand the mechanisms of partnership, collaboration, and consultation. While Stewart, Banks, Crossman, & Poel (1995) have begun some of this work through a qualitative investigation identifying the mechanisms and meanings of lay-professional partnership from the perspective of both health professionals and lay individuals, follow-up quantitative research would be helpful to validate these identified mechanisms of partnership. Finally, a cost-benefit analysis of the use of lay helpers to complement and supplement professional health services is important.

Pragmatic Issues

Studies are needed of the comparative effectiveness of various volunteer recruitment strategies (flyers, word of mouth, newspaper/radio/T.V.) with specific populations. In particular, strategies need to be developed to recruit socially disadvantaged individuals e.g. young, low-income, and immigrant populations. Empirical investigations are needed to develop an understanding of what contributes to volunteer satisfaction and the relationship between satisfaction and volunteer attrition. A greater understanding of the conceptual differences between a peer lay helper and a paraprofessional is required in order to guide orientation sessions. Finally, future research should focus on identifying variables to predict peer dyad continuance.

Implications for Practice

This trial was one of the first to evaluate the effect of peer support on breastfeeding duration among primiparous women and should be considered a pilot test. As such, the results should be viewed with caution. In this trial, it was determined that telephone peer support, in conjunction with professional health services and embedded social networks, may be an effective clinical support intervention to increase the proportions of primiparous women who continue to breastfeed until 3 months postpartum. However, the long-term effects of peer support are unclear, since the trial ended at 3 months postpartum. Given the low rates of recruitment into the community program that involved prenatal registration, compared to the high acceptance rates of women in the postpartum period in this trial, it appears that recruitment of mothers in the postpartum period may be more efficient than recruitment in the prenatal period. However this develops pragmatic issues that will need to be considered such as: (1) who will inform the mothers about this program before their 24 to 48 hour hospital discharge, (2) if a mother wants to participate, how does the volunteer coordinator receive her name, and (3) will professional staff recognize the value of peer support and promote this program? As a possible indicator of current professional perceptions of this lay support program or a sign of a lack of knowledge regarding this program, referrals in this trial were unidirectional from peer volunteers to health care professionals. Future peer support programs should develop partnerships with professionals to promote reciprocal referrals. As such, preliminary work will need to be conducted to assess this readiness for partnership among both hospital and community professionals and to develop strategies to avoid "the perils of partnership" (Gottlieb, 1985).

There appears to be no need to standardize the intervention. As such, the peer volunteer activities should continue to be based upon the mothers' individualized needs and contact should commence within the first 48 hours after discharge. However, there is an indication that the peer volunteer orientation session should be standardized. Specifically, during the orientation session it is important to address the referral process to health care professionals (such that mothers receive the

appropriate quality care they deserve) and to discuss the negative outcomes found with mothers in this trial (to prevent dissatisfaction with future new mothers). In addition, it is salient to explore the interactional nature of the peer volunteer-mother relationship such that new volunteers develop realistic expectations and do not experience disappointment and hurt feelings. This effort which may directly lead to lower attrition rates. Moreover, sources of support should be available for the peer volunteers themselves, such as support meetings in volunteer homes and/or key contact people to act as confidants. Finally, the volunteer coordinator role is a very time-consuming position and serious efforts should be made to make this a paid position.

Concluding Statement

While most mothers in North America prematurely discontinue breastfeeding, the results from this trial indicate that peer support, in conjunction with professional and social support, may help new mothers reach their breastfeeding goals and continue to breastfeed. Peer support also promoted mothers to evaluate themselves and their breastfeeding experience more positively resulting in higher maternal satisfaction with infant feeding method. Furthermore, there is beginning evidence that peer volunteers may be effective mediating links between mothers in the community and health care professional. This may be particularly beneficial for high-risk breastfeeding mothers. Although this is one of the first trials evaluating breastfeeding peer support, these positive results indicate that further research is warranted into this potentially highly effective breastfeeding support intervention.

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Appendix A
Characteristics of Professional Breastfeeding Support Trials

Table 1

Author	Methods	Participants	Intervention	Results
Barros et al., (1994)	Randomized Controlled Trial (RCT)	838 urban mothers in southern Brazil	Postnatal Only - home visits at 5, 10, and 20 days postpartum	Significant difference between the groups in mean # of days breastfeeding ($p = .03$)
Brent et al., (1995)	RCT -blocked randomized procedure	108 primiparous, low-income, inner city women in Pittsburgh, PA	Prenatal - 2 to 4 individual 15 minute sessions with lactation consultant Postnatal - daily in-hospital visits, phone contact after 48 hours d/c, 1-week visit to lactation clinic, lactation consultation with home visit until weaning	Significant differences between groups in breastfeeding initiation ($p = .002$) and breastfeeding duration ($p = .005$)
Frank et al., (1987)	RCT Randomized block - envelopes	343 "multiethnic" English or Spanish speaking, low-income women in Boston	Postnatal Only - in-hospital visits, 24-hr helpline, scheduled telephone contact	Significant difference between groups in breastfeeding duration at 2 months but not the entire study
Gagnon et al., (1997)	RCT - randomized block - envelopes	175 healthy pregnant women in Montreal who were eligible to participate in early discharge program	Prenatal - nursing care available at home or via telephone at 34-38 wks Postnatal - telephone or visit at < 48 hours and at 3, 5, and 10 days postpartum	No significant differences between groups in exclusive breastfeeding (OR = 1.25, CI = .88 - 1.75) at one month
Grossman et al., (1990)	RCT - random coin toss	97 low-income who delivered a healthy newborn at Hospital in Columbus, Ohio	Postnatal Only - in-hospital visits, 24-hr helpline, scheduled calls, written information	No significant difference between groups in breastfeeding duration
Haider et al., (1996)	RCT	- 250 partially breastfeeding mothers whose infants (age < 12 weeks) were admitted to hospital in Bangladesh	Postnatal Only - in-hospital counselling, home visit 1 week after hospital discharge	Significantly differences between groups ($p<.001$) in relation to exclusive breastfeeding at 2 weeks after hospital discharge
Jones & West (1988)	RCT - not randomized individually	678 postpartum women in UK	Postnatal Only - in-hospital visits, home visits	Significant difference in breastfeeding duration between groups
Lynch et al., (1986)	RCT - method not described	270 postpartum women with a singleton birth in Prince George, BC	Postnatal Only - home visits, contact phone number given to mother, scheduled telephone contact	No significant difference between groups in breastfeeding duration ($p <.94$)
Mongeon & Allard (1995)	RCT	194 pregnant women in Montreal	Prenatal - individualized regular telephone contact by volunteer Postnatal - telephone contact by volunteer	No significant differences were found between groups in breastfeeding duration (only 30% of all mothers continued to breastfeed)
Moore et al., (1988)	RCT - method not described	525 women, 34-38 wks gest. with a family hx of eczema or asthma in UK	Postnatal Only - daily in-hospital visits, "feeding diaries", 24-hr helpline, home visits	No significant difference between groups in breastfeeding duration at 3 months (only 26% breastfeeding at 3 months)
Redman et al., (1995)	Quasi-experimental - allocation to groups based on even or odd numbered consent form	all primiparous women who "booked in" for delivery at a specific hospital in Newcastle, Australia ($N = 235$)	Prenatal - written material, group and individual sessions with lactation consultant Postnatal - written material, in-hospital visit, scheduled telephone contact, breastfeeding helpline, support group	No significant difference between the groups in breastfeeding duration at either 6 weeks [χ^2 (1) = .025, $p <$ .875] or 4 months [χ^2 (1) = .093, $p < .761$].
Sjolin et al., (1979)	RCT	146 postpartum women in Sweden	Postnatal Only - weekly visits	Significant differences between the groups in breastfeeding duration at 6 months (47% vs. 38%)

Appendix B
Concepts Related to Peer Support

From the concept analysis it should be clear what peer support is, how it occurs, and what are the possible consequences. However, not all of the literature concerning peer support provides a distinct understanding of the phenomenon as various concepts are applied in conjunction with peer support. To clarify any misconceptions, related concepts will be described and the conceptual differences delineated.

Indigenous Lay Helper

Lay helpers have been referred to as community health care aides, community health advisors, community health workers, community advocates, family health promoters, neighborhood health workers, neighborhood workers, neighborhood-based public health workers, health guides, health advocates, health assistants, lay workers, lay health educators, lay health workers, neighborhood representatives, auxiliary health workers, family health counsellors, community workers in human services, paraprofessionals, allied health professionals, resource mothers and "indigenous non-professionals drawn from lower socioeconomic groups." *Indigenous* lay helpers typically are members of a target population or residents of a target community and a created source of support that is internal to a community (Hill, et al. 1996). Indigenous qualities, in general, include possession of the social, environmental, and ethnic attributes of a subculture and, in more specific terms, a sharing with a client of a verbal and nonverbal language, an understanding of a population's health beliefs and barriers to health care services, and an enhanced empathy with a specific population and its health service needs (Giblin, 1989). As members of a target community or population, lay helpers know the context in which health issues, problems and possible solutions exist. Thus, they are able to help investigators understand the world view of the people under study (Kauffman, 1994; Salber, 1979) and the intrapersonal, interpersonal, organizational, community, cultural, and policy factors that affect their health (Kaplan & Keil, 1993). Hence, indigenous is ascribed as being of the *same* community and subculture and the sharing of *similar* values, attitudes,

and behaviours between the provider and client. These qualities are thought to enhance the lay helper's role as a liaison between professional and lay health languages, attitudes, and behaviours, and the possession of an active and credible role in the life of a client (Giblin, 1989). While indigenous lay helpers can provide peer support if they possess targeted experiential knowledge, they can also perform numerous other roles that do not incorporate the combination of informational, emotional, and appraisal support such as administrative tasks.

Natural Lay Helper

Natural helpers are lay people to whom others "naturally" turn for advice, emotional support and tangible aid (Eng & Smith, 1995). In nearly all communities there are individuals who have a reputation for good judgment, sound advice, a caring ear, and being discreet. People often turn to these individuals embedded in their social networks when they have a concern rather than or before seeking professional help. This support is provided by a person such as a neighbor, friend, or co-worker whom individuals already know and they often function as a "first contact" person. These natural helpers are different from peer lay helpers in that they do not serve in professional programs or community organizations, they do not extend existing services, or reach and motivate the population to use and comply with existing regimens of care (Eng & Smith ,1995). As noted by Israel (1985), their natural helping is so much a part of their daily lives that they often do not recognize this function in themselves. Examples of the use of natural lay helpers can be found in Davis et al., (1994), a study which examined the efficacy of a church-based model of social influence in improving access to and participation of underserved minority women in a cervical cancer control program. Furthermore, Eng (1993) used natural lay helpers in the "Save Our Sisters Project" to reach older, black women through their existing kin, friendship, and job networks to influence breast cancer screening.

Paraprofessional

When integrating peer lay helpers into a program, health care professionals should be cautious with the training sessions in order to avoid the professionalization of lay helpers and the development of paraprofessionals. When peer lay helpers are professionalized, their talents and accountability to their community or population are shifted to the health system, diminishing their role and credibility with clients (Eng & Smith, 1995). Unfortunately, it is unknown as to how much training must occur in order to create a paraprofessional. For example, in McFarlane and Wiist's (1997) program to prevent abuse during pregnancy, residents of the project's service area were "hired" and the initial training program was 23 hours and consisted of three parts: (1) advocacy training, (2) counseling and crisis intervention, and (3) philosophy and process of "peer" advocacy. This classroom training was followed by a series of weekly seminars and field trips to agencies and organizations to learn how to access their resources. In addition, the peer lay helpers received specialized instructions by the staff of the domestic violence unit of the district attorney's office and the police department in how to assess protective orders, magistrates orders, and implications of the state's new spousal exemption law. With all this current and future training, are these lay helpers still peers or are they now paraprofessionals?

According to Giblin (1989), training and orientation of lay helpers should be less the acquiring of specific program skills and more the effort to preserve the indigenous essence of the individual. Approaches to preserving indigenous/peer qualities while inculcating program or organizational goals include the following: (1) training lay helpers and professionals concurrently to facilitate the mutual valuing of skills and perspectives; (2) avoid rigid didactic training which may undermine the natural skills for which the lay helpers were selected; and (3) provide a format for lay helpers' contributions to evolving program goals and procedures (Giblin).

Appendix C
Breastfeeding Assessment Questionnaire

Code: ☐☐☐ ☐ 4wk ☐ 8wk ☐ 12wk Assessment

Hello, _____, my name is Lisa Wilson. I am the research assistant for the breastfeeding study you agreed to participate in when you delivered your baby. I would like to ask you a few questions about your experience feeding your baby. It will take approximately 5 to 10 minutes. Is this a convenient time for you? If not, when would you like me to call you? Date: _____ Time: _____

Date: ☐☐ ☐☐ ☐☐
dd mm yy

PART I: INFANT FEEDING CATEGORY

1. How have you been feeding your baby in the past four weeks?

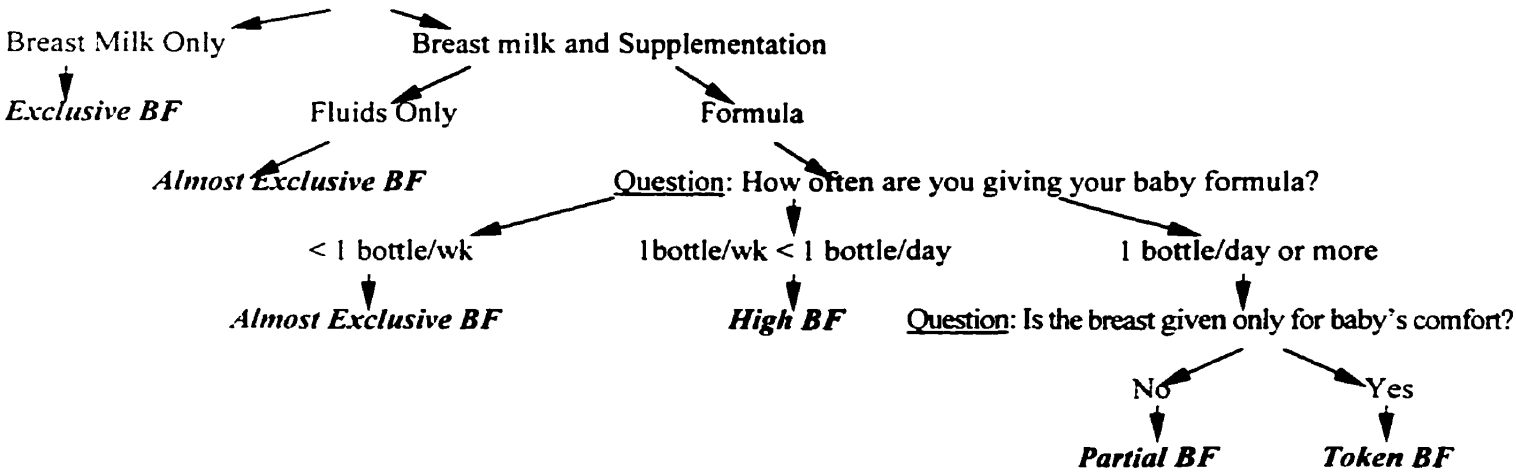
1. ❍ breastfeeding alone or in combination with something else
2. ❍ bottlefeeding ➡ When did your baby last receive breast milk (date)? _____ (continue to Part II)

2. Has your baby received breast milk in the past 24 hours?

1. ❍ yes
0. ❍ no ➡ When did your baby last receive breast milk (date)? _____

If the mother is breastfeeding, follow the decision tree for her specific breastfeeding category.

3. What else besides breast milk has your baby received in the past 4 weeks?



After completing the decision tree, please check ❍ the mother's infant feeding category and validate it with her.

Mother's Response	Category of Infant Feeding	Requires that the Infant Receive	Allows the Infant to Receive	Does Not Allow the Infant to Receive
1. ❍	Exclusive Breastfeeding	Breast milk (including milk expressed)	Vitamins, minerals, medicines	Anything else
2. ❍	Almost Exclusive Breastfeeding	Breast milk as the predominant source of infant nourishment	< 1 bottle/week of non-human milk, water, water-based drinks, fruit juice, ORS, ritual fluids	Anything else
3. ❍	High Breastfeeding	Breast milk as the predominant source of infant nourishment	> 1 bottle/week of non-human milk	1 bottle/day of non-human milk
4. ❍	Partial Breastfeeding	Breast milk and any food or liquid	1 bottle/day of non-human milk or any food or liquid	
5. ❍	Token Breastfeeding	Non-human milk or any food or liquid as the predominant source of infant nourishment	Breast is used for comfort or to console the infant with minimal nutritional contribution	
6. ❍	Bottlefeeding	Any food or liquid		

4. (4 week assessment only) Did your baby receive any supplementation other than breast milk while in the hospital?

1. ❍ yes ➡ What? _____ Why? _____
0. ❍ no

5. Have you received a free sample of infant formula in the past 4 weeks?

1. ❍ yes → From who/where? _____
0. ❍ no

If the mother is not exclusively breastfeeding ask her the following:

6. Is this a change from the last time I called you (or when you were discharged home from the hospital)?

1. ❍ yes → The next question will help us to understand how you made your decision about how to feed your baby
0. ❍ no → continue to Part III

PART II: INFANT FEEDING RATIONALE

If the mother is not exclusively breastfeeding select her following infant feeding category and ask her the corresponding question:

1. Almost Exclusive Breastfeeding → **Why did you decide to add other fluids?** _____

2. High Breastfeeding → **Why did you decide to add formula to your baby's diet?** _____

3. Partial Breastfeeding → **Why did you decide to add formula to your baby's diet?** _____

4. Token Breastfeeding → **Why did you decide to switch to mainly formula feedings?** _____

5. Bottlefeeding → **Why did you decide to discontinue breastfeeding?** _____

PART III: BREASTFEEDING PROBLEMS AND CONCERNS IN PAST 4 WEEKS

The next part concerns any problems or questions you have had about breastfeeding in the past 4 weeks.
If the mother is still breastfeeding or has breastfeed in the past 4 weeks ask the following:

1. **What breastfeeding problems or concerns have you experienced with your BABY in the last 4 weeks (or since I last spoke to you)?**

Read the whole list to the mother and check ❍ if she has experienced it in the last 4 weeks and then confirm the items with the mother.

Feeding Concerns	*Physical Concerns*	*Behaviour Concerns*
01. ❍ Not latching properly	09. ❍ Poor weight gain	14. ❍ Crying frequently
02. ❍ Positioning difficulties	10. ❍ Ill _____	15. ❍ Very Sleepy
03. ❍ Needing to give supplements	11. ❍ Jaundice	16. ❍ Fussy at the breast
04. ❍ Spitting up	12. ❍ Bowel/urine frequency	17. ❍ Fussy after feeding
05. ❍ Breastfeeding too frequently	13. ❍ Growth pattern/spurt	18. ❍ Days and nights switched
06. ❍ Refusing the breast		19. ❍ Other _____
07. ❍ Sucking problem		
08. ❍ Breastfeeding for a long time		

Total Number of Baby Concerns: Feeding _____ Physical _____ Behavioural _____ Overall _____

2. **What breastfeeding problems or concerns have you experienced with YOURSELF in the last 4 weeks (or since I last spoke to you)?** *Read the whole list to the mother and check ❍ if she has experienced it in the last 4 weeks and then confirm the items with the mother.*

Breast Concerns	*Physical Concerns*	*Emotional Concerns*
20. ❍ Engorged breast	31. ❍ Tired/sleep deprivation	38. ❍ Worried about breastfeeding
21. ❍ Inadequate milk supply	32. ❍ Ill _____	39. ❍ Finding time for self
22. ❍ Let-down reflex	33. ❍ Medications, safe with Bf	40. ❍ Feeling isolated/tied down
23. ❍ Sore nipples	34. ❍ Pain, difficult to breastfeed	41. ❍ Feeling sad/crying
24. ❍ Cracked nipples	35. ❍ Diet	42. ❍ Returning to work
25. ❍ Inverted nipple	36. ❍ Weight loss	43. ❍ Weaning
26. ❍ Leaking milk	37. ❍ Contraception/sexuality	44. ❍ Breastfeeding in public
27. ❍ Milk expression		45. ❍ Other _____
28. ❍ Breast lump		
29. ❍ Mastitis		
30. ❍ Breast surgery		

Total Number of Mother Concerns: Breast _____ Physical _____ Emotional _____ Overall _____

3. **What breastfeeding problems or concerns have you experienced with your PARTNER/FAMILY in the last 4 weeks?** *Read the whole list to the mother and check ❍ if she has experienced it in the last 4 weeks and then confirm the items with the mother.*

46. ❍ Regulating demands of family
47. ❍ Partner feels left out
48. ❍ Family not supportive of breastfeeding
49. ❍ Sibling jealousy
50. ❍ Other_____

Total Number of Partner/Family Concerns: _____ OVERALL Total # of Concerns: _____

PART IV: HEALTH SERVICE UTILIZATION

If the mother has experienced any breastfeeding problems or concerns ask the following:

1. Did you receive any help with your problems or concerns?

1. ❍ yes
0. ❍ no → Why not? _____

2. Who helped you with your breastfeeding problems or concerns?

Read the whole list of potential sources of help to the mother and check ❍ if she has experienced it in the last 4 weeks. For each source of help used, ask the mother for what problem it was used for, how many times did she use it, whether the source of help was helpful or not, and would she recommend it to a friend.

Source of Help	For what problem or concern was this help used for? (list above number)	Number of times used?	Helpful? Scale: 1 to 5 1 = not at all helpful 5 = very helpful	Would you recommend it to a friend? (Yes or No)
01. ❍ Warm-line (hospital)				
02. ❍ Breastfeeding clinic: where?_____				
03. ❍ Public Health Department				
04. ❍ Lactation consultant in the community				
05. ❍ Pediatrician				
06. ❍ Family physician				
07. ❍ Midwife				
08. ❍ La Leche League				
09. ❍ Partner				
10. ❍ Family member: who? _____				
11. ❍ Friend				
12. ❍ Volunteer (Breastfeeding Connections)				
13. ❍ Books/pamphlets				
14. ❍ Other:_____				

PART V: SOURCES OF SOCIAL SUPPORT

1. Is the baby's father supportive of your breastfeeding?

1. ❍ yes → How? _____
0. ❍ no → Why not? _____

2. Have you been talking to someone regularly about breastfeeding?

1. ❍ yes → Who? _____ How often? _____
0. ❍ no

3. Is there someone who has not been supportive of your breastfeeding?

1. ❍ yes → Who? _____ How? _____
0. ❍ no

Thank you so much for answering these questions. Your time is greatly appreciated. I will call you again in 4 weeks to see how you and your baby are doing.

Appendix D
Maternal Satisfaction with Infant Feeding Questionnaire

Date: ☐☐☐ Code: ☐☐☐

Hello, _____, my name is Lisa Wilson. I am the research assistant for the breastfeeding study you agreed to participate in when you delivered your baby. I would like to ask you a few questions about how satisfied you are about how you fed your baby. It will take approximately 10 minutes. Is this a good time? If not, when would you like me to call you? Date: _____ Time: _____

We know that some women have positive experiences with breastfeeding and other women do not. I am going to ask you a few questions about some of the ways mothers feel about feeding their baby. It is ok for you to disagree with these statements. When I ask you these questions please consider your overall infant feeding experience. With each statement that I read to you please indicate your agreement or disagreement by responding from 1 to 5 with:

1 = strongly disagree
2 = disagree
3 = no opinion or unsure
4 = agree
5 = strongly agree

In other words, 1 means that you strongly disagree with the statement and that you can give an answer up to 5 which means that you strongly agree with the statement. Would you like a minute to write this down?

	Strongly Disagree				Strongly Agree
1. While feeding your baby you felt a sense of inner contentment.	1	2	3	4	5
2. You could easily fit your baby's feedings with your other activities.	1	2	3	4	5
3. You felt extremely close to your baby while feeding.	1	2	3	4	5
4. You were satisfied with your baby's growth.	1	2	3	4	5
5. Feeding your baby was a very nurturing, maternal experience.	1	2	3	4	5
6. You felt too tied down by the way you were feeding your baby.	1	2	3	4	5
7. Feeding soothed your upset or crying baby.	1	2	3	4	5
8. How you fed your baby made you feel like a good mother.	1	2	3	4	5
9. You really enjoyed feeding your baby.	1	2	3	4	5
10. How you fed your baby made you feel more confident as a mother.	1	2	3	4	5
11. Feeding was a special time with your baby.	1	2	3	4	5
12. You are happy with the way you fed your baby.	1	2	3	4	5

13. If you were to have another child, how would you feed your new baby?

1. ❍ breastfeed ➡ 1. ❍ the same way as the first child
   2. ❍ different ➡ How? _____
2. ❍ bottlefeed ➡ Why? _____

14. What method of infant feeding would you recommend to your friends?

1. ❍ breastfeeding ➡ Why? _____
2. ❍ bottlefeeding ➡ Why? _____

15. Overall, are you satisfied with how you are feeding your baby?

1. ❍ yes
0. ❍ no ➡ Why not? _____

Appendix E
Perception of Peer Support Questionnaire

Code: ☐☐☐

When I ask you these questions please consider your overall infant feeding experience. With each statement that I read to you please indicate your agreement or disagreement by responding from 1 to 5 with:

1 = strongly disagree
2 = disagree
3 = no opinion or unsure
4 = agree
5 = strongly agree

In other words, 1 means that you strongly disagree with the statement and that you can give an answer up to 5 which means that you strongly agree with the statement. Would you like a minute to write this down?

Did your volunteer:	Strongly Disagree				Strongly Agree
01. Listen to what you had to say	1	2	3	4	5
02. Show concern about your feelings	1	2	3	4	5
03. Care about how breastfeeding was going for you	1	2	3	4	5
04. Establish a sense of trust	1	2	3	4	5
05. Make you feel that you could call her in times of trouble	1	2	3	4	5
06. Provide you with useful information	1	2	3	4	5
07. Give you helpful suggestions to your questions	1	2	3	4	5
08. Tell you what you could expect in certain breastfeeding situations	1	2	3	4	5
09. Make you feel better after talking to her	1	2	3	4	5
10. Increase your confidence to breastfeed	1	2	3	4	5

11. If you could do it over again, would you like to have a volunteer?
1. ❍ yes → Why? _____
0. ❍ no → Why not? _____

12. Did your volunteer help you reach your breastfeeding goals/expectations?
1. ❍ yes → How? _____
0. ❍ no → Why not? _____

13. Do you think that the volunteer had an effect on how long you breastfed?
1. ❍ yes → Why? _____
0. ❍ no → Why? _____

14. Do you feel you had enough contact with your volunteer to help you with breastfeeding?
1. ❍ yes
0. ❍ no → How often would you have liked your volunteer to have contacted you? _____

15. Were you able to speak to your volunteer at the time you experienced problems?
1. ❍ yes
0. ❍ no → Why not? _____

16. Did you contact your volunteer when you had a problem or question?
1. ❍ yes
0. ❍ no → Why not? _____

17. Do you think all new breastfeeding mothers should be offered a volunteer?
1. ❍ yes → Why? _____
0. ❍ no → Why not? _____

18. What, if anything, would you have liked your volunteer to have done differently?

_____

19. Overall, how satisfied are you with your volunteer experience?
1. ❍ very unsatisfied 2. ❍ unsatisfied 3. ❍ unsure/no opinion 4. ❍ satisfied 5. ❍ very satisfied

Appendix F
Peer Volunteer Activity Log

Volunteer code: _____ Mother's Code: _____
Mother's first and last name: _____
Mother's delivery date: _____
Dear Volunteer,

To help us understand the nature of peer support, please document all activity that you have with your new breastfeeding mother. **When your relationship with the mother has ended or at three months postpartum, please mail this sheet in the stamped, self-address envelope to Cindy-Lee Dennis (MIRU, Centre for Research in Women's Health, 790 Bay Street, Suite 751, Toronto, Ontario, M5G 1N8).** Thank you so much for participating in this study; your time is greatly appreciated. If you have any questions or concerns please do not hesitate to call Cindy-Lee Dennis, RN, MScN, PhD student at (416) 364-9985 or Dr. Ellen Hodnett at (416) 351-3763.

DATE CONTACT INITIATED: _____ DATE CONTACT ENDED: _____

Volunteer Activity

Contact 1 Date: _____
1. Type of Contact (tick only one)
   1. Talked to mother (duration: _____ minutes); 2. ☐ Left message; 3. ☐ No answer; 4. ☐ Mother/father called; 5. ☐ Home visit
2. Action Taken (tick all that apply)
   1. Only talked to mother; 2 ☐ Referred (where: _____); 3. ☐ Contacted someone for mother (who: _____);
   4. Other: _____
3. Do you feel you were helpful?
   1. Yes➡ Explain _____
   2. No ➡ Explain _____

Contact 2 Date: _____
1. Type of Contact (tick only one)
   1. Talked to mother (duration: _____ minutes); 2. ☐ Left message; 3. ☐ No answer; 4. ☐ Mother/father called; 5. ☐ Home visit
2. Action Taken (tick all that apply)
   1. Only talked to mother; 2 ☐ Referred (where: _____); 3. ☐ Contacted someone for mother (who: _____);
   4. Other: _____
3. Do you feel you were helpful?
   1. Yes➡ Explain _____
   2. No ➡ Explain _____

Contact 3 Date: _____
1. Type of Contact (tick only one)
   1. Talked to mother (duration: _____ minutes); 2. ☐ Left message; 3. ☐ No answer; 4. ☐ Mother/father called; 5. ☐ Home visit
2. Action Taken (tick all that apply)
   1. Only talked to mother; 2 ☐ Referred (where: _____); 3. ☐ Contacted someone for mother (who: _____);
   4. Other: _____
3. Do you feel you were helpful?
   1. Yes➡ Explain _____
   2. No ➡ Explain _____

Contact 4 Date: _____
1. Type of Contact (tick only one)
   1. Talked to mother (duration: _____ minutes); 2. ☐ Left message; 3. ☐ No answer; 4. ☐ Mother/father called; 5. ☐ Home visit
2. Action Taken (tick all that apply)
   1. Only talked to mother; 2 ☐ Referred (where: _____); 3. ☐ Contacted someone for mother (who: _____);
   4. Other: _____
3. Do you feel you were helpful?
   1. Yes➡ Explain _____
   2. No ➡ Explain _____

Appendix G

Volunteer Orientation

Agenda for Volunteer Orientation Session

Icebreaker:

- Each mother introduces self (and baby) and shares her reasons and interest in becoming a volunteer with the Halton Breastfeeding Connections.

Review:

- Breastfeeding Benefits
- History of the Halton Breastfeeding Connection
- The volunteer handbook is provided for you to keep and use as a guide. It include the history and rationale for the development of the Halton Breastfeeding Connection.
- Walk through handbook pointing out significant pages.

Effective Telephone Support:

- Discuss the role of the Breastfeeding Connection Telephone Support. Emphasize the role to be a "mother-to-mother" peer support and not a "breastfeeding expert".
- Arrange volunteers into pairs and ask them to role-play using their own breastfeeding experience. One acts as a volunteer, the other as the mother. Switch roles after ten minutes.
- Bring the group back together to share insights, what worked, what didn't. Ask them to identify the communication skills they were able to demonstrate. (Handout: Effective Telephone Support)

All Babies and Mothers are Different:

- Review together the range of personal breastfeeding experiences within the group and record on a board or flip chart.
- Frequency of your baby's feedings in early weeks
- Age of your baby when she/he slept through the night
- Age of your baby when first on an outing
- Summarize by highlighting the normal range of feeding, sleeping, or adjustment patterns.

Break

Anatomy & Physiology:

- Review basic anatomy (see overheads).
- Review latch, positioning and suck/swallow patterns.
- Identify common problems, solutions and prevention.

When to Get Help:

- Discuss the limitations of the role of the volunteer role (handout).
- Complete self-evaluation guide (hand-out).
- Invite volunteers to attend any or all of the sessions of the Healthiest Babies Possible program at the Health Department.

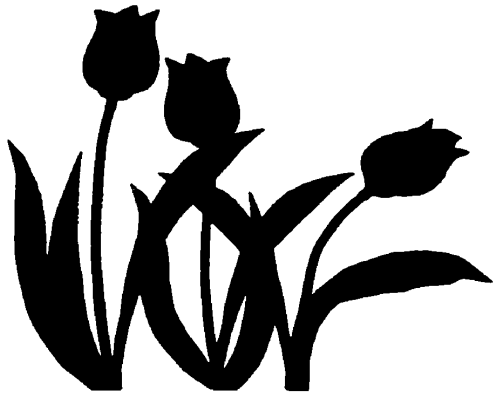
NB. Volunteers often bring their babies to orientation sessions.

TABLE OF CONTENTS

Halton Breastfeeding Connection

Appendix I
Peer Volunteer Recruitment Flyer

Needed: Mothers who are Experienced at Breastfeeding



An invitation to join the Mother-to-Mother Breastfeeding Telephone Support Program

Most new mothers choose to breastfeed their babies. However in the days and weeks after discharge from the hospital, many new mothers need some help with breastfeeding, and not all receive the help they require. To address the needs of new breastfeeding mothers, a community program called ***"The Halton Breastfeeding Connection"*** was started in 1993 and consists of experienced breastfeeding mothers offering ***mother-to-mother telephone support*** to new breastfeeding mothers.

This breastfeeding support program is ***currently recruiting experienced mothers*** who have breastfed or are breastfeeding a baby to help support new mothers. To become a ***"breastfeeding volunteer"*** you will attend a 1½ hour orientation session where you will learn how to offer telephone support to a new breastfeeding mother and you will meet experienced moms like yourself.

If you are interested in finding out more information or would like to help new mothers by becoming a breastfeeding volunteer, ***please call Liana at***:
XXX XXXX

Appendix J

Peer Volunteer Demographic Form

Since you have agreed to participate in the study involving the Breastfeeding Connections, the researchers would like to be able to describe the volunteers. Would mind answering a few questions about yourself? Your name will not be given to the researchers and the information will be kept confidential.

Date: _____

1. Volunteer code: V_____

2. How old are you? _____ years

3. How many children do you have? _____

4. What is the longest you have breastfed a child? _____ month/s

5. What is your highest level of education you have completed?

1. ❍ elementary
2. ❍ high School
3. ❍ college
4. ❍ university (undergraduate)
5. ❍ university (graduate)
6. ❍ other (please specify) _____

6. Are you currently employed?

1. ❍ yes ➡ ❍ full-time ❍ part-time ❍ casual ❍ other: _____
2. ❍ no
3. ❍ on maternity leave

7. What is your occupation? _____

Please describe the type of work you do: _____

8. Why did you become a volunteer?

1. ❍ positive breastfeeding experience - wanted to help other mothers
2. ❍ negative breastfeeding experience - wanted to help other mothers
3. ❍ would have liked mother-to-mother support when you were breastfeeding
4. ❍ received mother-to-mother support and wanted to provide it to others
5. ❍ to be a breastfeeding advocate
6. ❍ other: _____

9. Where you born in Canada?

1. ❍ yes
0. ❍ no ➡ Where? _____

Appendix K
Peer Volunteer Demographic Characteristics

Table 5
Peer Volunteer Demographic Characteristics

Variable	Level	f (%)
Age	< 20 years	0
	20-24 years	1 (1.7)
	25-29 years	12 (20.7)
	30-34 years	27 (46.6)
	>34 years	18 (31)
Born in Canada	Yes	45 (77.6)
	No	13 (22.4)
Parity	1 child	28 (48.3)
	2 children	20 (34.5)
	3 children	8 (13.8)
	4 children	2 (3.4)
Level of Education	Elementary	0
	High School	6 (10.3)
	College	18 (31.0)
	University (undergraduate)	28 (48.3)
	University (graduate)	6 (10.3)
Employment Status	Full-time	14 (24.1)
	Part-time	13 (22.4)
	Casual	5 (8.6)
	Self-Employed	2 (3.4)
	No	24 (41.4)
On Maternity Leave	Yes	13 (22.4)
	No	45 (77.6)
Why Became a Volunteer[a]	Positive breastfeeding experience	47 (81)
	Negative breastfeeding experience	12 (21)
	Would have liked to have had a volunteer	18 (31)
	Received help from a volunteer	13 (22)
	Breastfeeding advocate	21 (36)

Note. N = 58
[a] multiple responses were received

Appendix L
Introduction to Prospective Participants Form

A registered nurse named Cindy-Lee Dennis, a PhD student in the University of Toronto, is conducting a study involving women, like yourself, who are breastfeeding a new baby. The purpose of the study is to test the effect of support from mothers with breastfeeding experience on new mothers' experiences with breastfeeding.

Ms. Dennis would like permission to contact you to further explain the study. The fact that you agree to have her contact you does not mean that you are consenting to participate in the study. It simply means that you are giving permission to have Ms. Dennis explain the study to you. There will be no risk to you; your hospital care will not change if you do not wish to get involved in the study.

If you are INTERESTED in listening to a further explanation of the study, thank you very much. Cindy-Lee will be in with you soon.

If you are NOT INTERESTED in the study, that is fine. Would you mind telling me why? It would help the researchers to know the reason why women are not interested in the study.

Thank you for your time.

_____

_____

_____

To Be Completed By The Team Leader/Staff Nurse

Date: _____
Room number: _____
Mother's name: _____

Participant verbal consent:

1. ❍ OBTAINED, researcher may contact potential participant
2. ❍ NOT OBTAINED, researcher may not contact potential participant

Appendix M
Letter of Explanation

I am Cindy-Lee Dennis, a PhD student in the University of Toronto, Graduate Department of Nursing Science. It is in partial fulfillment of the requirements for the PhD degree that I am conducting this research study, under the supervision of Dr. Ellen Hodnett, Professor of Nursing.

Although most women start breastfeeding in the hospital, many mothers encounter breastfeeding problems in the first month and some stop breastfeeding earlier than they thought they would. Some of these problems might have been avoided or solved quickly if the mother had support from someone who had breastfeeding knowledge. To help breastfeeding mothers, health care professionals have developed support services like breastfeeding clinics. However, not all mothers are able or feel comfortable to use this type of support. Some new mothers prefer to be less formal and talk to family, friends or other mothers like themselves. Because this informal support is used by many mothers, new breastfeeding programs are being developed which use experienced mothers who will telephone new mothers to help them with breastfeeding concerns.

However, there have been very few studies which have evaluated whether experienced mothers are helpful or not. Because of these uncertainties, I am conducting a study to evaluate the effect of support from experienced mothers on new mothers' experiences with breastfeeding. All first-time mothers who live in Halton Region and plan to breastfeed their babies can participate in this study.

If you agree to take part in this study you will be randomly assigned to receive either the usual breastfeeding support services or to receive the usual breastfeeding support services plus support from an experienced mother. Randomisation means that neither you nor I choose which type of support you will receive; rather the type of support is chosen at random, or by chance. This process of choosing which type of support you receive is very important to be able to answer the question as to how effective experienced mothers are with helping new breastfeeding mothers.

If you are in the "usual" support group, you will have access to all of the available breastfeeding services in your community. You will receive a telephone call from a research assistant every month for three months; she will ask about your method of feeding your baby and what problems or concerns you have had.

If you are in the "experienced mother" support group, you will experience the same care as all the other mothers except that you will be matched with an experienced mother who is part of the Halton Breastfeeding Connection program. She will telephone you shortly after you and your baby have been discharged home, to ask you if you have any questions or concerns. She will then call you as often as you like for as long as you like, to discuss any concerns or questions you have about breastfeeding.

If you agree to participate your age, delivery date, expected date of discharge, method of delivery, and marital status will be collected from your medical record. Your address will also be obtained such that if you are to receive mother-to-mother support, we will be able to match you with an experienced mother in your neighbourhood.

The information that is collected will be kept confidential and in a locked filing cabinet. Your name and any identifying information will not be used in any written report of the study.

You may refuse to participate in this study. If you agree to participate you may withdraw from the study at any time with no effect on your care in the hospital or after discharge. Although there are no known risks, you may also not directly benefit from participating in this study.

I will gladly answer any questions you may have about the study and your participation in it.

Sincerely,

Cindy-Lee Dennis, RN, MScN, PhD Student

Appendix N
Consent Form

Breastfeeding Peer Support Trial

Consent Form

Code: ☐☐☐

INVESTIGATOR: Cindy-Lee Dennis, RN, MScN, PhD Student, University of Toronto, Graduate Department of Nursing Science

I acknowledge that the research procedures described on the attached form have been explained to me and that any questions that I have asked have been answered to my satisfaction. I have been informed of the alternatives to participation in this study. It has been explained to me that participation in the study involves that I am randomly assigned to either receive help from an experienced mother or to receive usual breastfeeding support. I know that I may ask now or in the future any questions that I have about the study or the research procedures, by contacting Cindy-Lee Dennis at (416) 364-9985 or Dr. Ellen Hodnett at (416) 351-3763.

I understand that my name will not be used in any written report and complete confidentiality will be maintained. I understand that I may refuse to supply any information requested, and that I am free to withdraw from the study at any time without the quality of care for me and my baby being affected.

I hereby consent to participate in the study.

Date: _____ Signature: _____

Appendix O
Participant Demographic and Personal Form

Date: ☐☐☐☐ Code: ☐☐☐

Would you mind if I asked you a few questions about yourself? It will only take a few minutes and it would help me to describe the women in the study.

1. What is your home telephone number? _____

2. When did you first decide to breastfeed your baby?

1. ❍ before pregnancy
2. ❍ during pregnancy
3. ❍ at/after birth

3. Who influenced your decision *most* to breastfeed your baby?

1. ❍ no one - I made the decision myself
2. ❍ partner
3. ❍ mother
4. ❍ mother-in-law
5. ❍ other family member(s), specify _____
6. ❍ friends
7. ❍ public health nurse
8. ❍ midwife
9. ❍ physician
10. ❍ hospital nursing staff
11. ❍ lactation consultant
12. ❍ La Leche League
13. ❍ other, specify _____
14. ❍ do not know

4. How soon after birth did you breastfeed your baby for the first time?

1. ❍ $\leq$ 1 hour
2. ❍ 2-10 hours
3. ❍ $\geq$ 11 hours

5. Have you thought about how long you would like to breastfeed your baby?

1. ❍ yes
0. ❍ no (go to question 7)

6. About how long do you think you will breastfeed your baby?

1. ❍ less than 1 month
2. ❍ 1 month
3. ❍ 2 months
4. ❍ 3 months
5. ❍ 4 months
6. ❍ 5 months
7. ❍ 6 months
8. ❍ more than 6 months
9. ❍ as long as I can
10. ❍ do not know

7. Were you breastfed as a baby?

1. ❍ yes
2. ❍ no
3. ❍ do not know

8. Do you have a close family member/friend who has breastfed a baby?

1. ❍ yes
0. ❍ no

9. Did you attend prenatal classes?

1. ❍ yes
0. ❍ no

10. Did you attend a class on breastfeeding?

1. ❍ yes
0. ❍ no

11. When you became pregnant, were you smoking cigarettes daily, occasionally or not at all?

1. ❍ daily
2. ❍ occasionally
3. ❍ not at all

12. During your pregnancy, were you smoking cigarettes daily, occasionally or not at all?

1. ❍ daily
2. ❍ occasionally
3. ❍ not at all

13. What is the highest level of education you have completed?

1. ❍ elementary
2. ❍ high School
3. ❍ college
4. ❍ university (Undergraduate)
5. ❍ university (Graduate)
6. ❍ other (please specify) _____

14. Is there a particular ethnic or cultural group to which you belong?

1. ❍ Canadian/French Canadian
2. ❍ British (English, Scottish, Irish, Welsh or some combination of British origin)
3. ❍ Italian
4. ❍ Jewish
5. ❍ Black (Haitians, Jamaicans, other Caribbean, other West Indian and African Blacks)
6. ❍ Chinese
7. ❍ Indo-Pakistani (Bengali, Gujarti, Punjabi, Tamil, East Indian, Bangladesh, Pakistani, Singalese, and Sri Lankian)
8. ❍ West Asian-Arab (Afghan, Armenian, Iranian, Israeli, Kurdish, Turk, Egyptian, Iraqi, Lebanese, Maghrebain, Palestinian, Syrian)
9. ❍ German
10. ❍ French
11. ❍ Latin American
12. ❍ other, specify _____
13. ❍ do not know

15. Were you born in North America?

1. ❍ yes
0. ❍ no

16. What is your annual household income before taxes?

1. ❍ $0 - 19,999
2. ❍ $20,000 - 39,999
3. ❍ $40,000 - 59,999
4. ❍ $60,000 - 79,999
5. ❍ $80,000 - +

Thank you for you time.

Appendix P
Participant Medical Record and Randomization Information

Date: ☐☐☐☐ Code: ☐☐☐

DEMOGRAPHIC INFORMATION

1. Hospital

1. ❍ Hospital A
2. ❍ Hospital B

2. Mother's age _____

3. Marital status

1. ❍ married/common law
2. ❍ other _____

DELIVERY INFORMATION

4. Mode of delivery

1. ❍ vaginal →1. ❍ spontaneous
   2. ❍ low forceps
   3. ❍ mid forceps
   4. ❍ vacuum extraction
2. ❍ caesarean section

5. Perineum

1. ❍ intact
2. ❍ median episiotomy
3. ❍ mediolateral episiotomy
4. ❍ laceration: type _____ degree ____

6. Anaesthesia/Analgesia

1. ❍ none
2. ❍ epidural
3. ❍ spinal
4. ❍ general
5. ❍ local (pudendal block)
6. ❍ nitrous oxide (Entonox)
7. ❍ opioid
8. ❍ other (specify) _____

7. Weeks gestation: _____

8. Infant weight: _____

FOLLOW-UP INFORMATION

9. Delivery date _____

10. Expected date of discharge _____

11. Telephone number _____

RANDOMISATION INFORMATION

12. Group allocation

1. ❍ peer support
2. ❍ conventional support

13. Envelope number _____

MATCHING INFORMATION

14. Home address_____

Appendix Q
Additional Participant Information

Code: ☐☐☐

1. How long were you in the hospital after you gave birth to your baby? _____hours

2. While you were in the hospital was your baby ever in the special care nursery?
1. ❍ yes → Why? _____ → For how long? ____ hours
2. ❍ no

3. Did you experience any complications yourself while you were in the hospital?
1. ❍ yes → What?_____
2. ❍ no

4. When you were in labour did you have a midwife or doula?
1. ❍ yes → Which one? _____
2. ❍ no

5. Did you experience serious breastfeeding problems while you were in the hospital?
1. ❍ yes → What? _____
2. ❍ no

6. Were you seen by a lactation consultant/ breastfeeding clinic nurse while you were in the hospital?
1. ❍ yes → Did she help you with your breastfeeding? 1. ❍ yes 0. ❍ no
2. ❍ no

7. Did you receive a home visit by a health care professional?
1. ❍ yes → How many days after you were discharged home? _____
2. ❍ no

8. Where either you or your baby readmitted back into the hospital after you were discharged home?
1. ❍ yes → Who? _____ → Why? _____ → How many days after you were discharged home? _____
2. ❍ no

Appendix R
Non-randomized Patients

Date: ☐☐☐

1. Hospital
- 1. ❍ Hospital A
- 2. ❍ Hospital B

2. Patient's initials: _____

3. Maternal age: _____

4. Marital status:
- 1. ❍ married/common law
- 2. ❍ other _____

5. Ethnicity:
- 1. ❍ Caucasian
- 2. ❍ other (specify)_____

6. Mode of delivery
- 1. ❍ vaginal → 1. ❍ spontaneous
  - 2. ❍ low forceps
  - 3. ❍ mid forceps
  - 4. ❍ vacuum extraction
- 2. ❍ caesarean section

7. Perineum
- 1. ❍ intact
- 2. ❍ median episiotomy
- 3. ❍ mediolateral episiotomy
- 4. ❍ laceration: type _____ degree ____

8. Anaesthesia/Analgesia
- 1. ❍ none
- 2. ❍ epidural
- 3. ❍ spinal
- 4. ❍ general
- 5. ❍ local (pudendal block)
- 6. ❍ nitrous oxide (Entonox)
- 7. ❍ opioid
- 8. ❍ other (specify) _____

9. Weeks gestation: _____

10. Infant weight: _____

11. Reason for not participating:
- 1. ❍ ineligible: _____
- 2. ❍ eligible but not asked/already enrolled in peer program
- 3. ❍ strong preference to have a volunteer
- 4. ❍ participation in study is too burdensome
- 5. ❍ does not believe she has a problem and therefore does not need a volunteer
- 6. ❍ family or friends able to provide sufficient support
- 7. ❍ moving
- 8. ❍ no reason given
- 9. ❍ other _____

Appendix S
Occurrence and Frequency of Peer Volunteer Contacts

Table 6

Occurrence and Frequency of Peer Volunteer Contacts

Peer Volunteer Activity	Level	# of Mothers (N = 76)	%	M	SD	Max.
1st Peer Volunteer Contact	Before home	23	30.3	2.10	2.44	12
	1st day home	20	26.3			
	2nd day home	8	10.5			
	3rd day home	8	10.5			
	4th day home	6	7.9			
	5th day home	4	5.3			
	6th day home	2	2.6			
	7th day home	2	2.6			
	> 7th day	3	3.9			
# of Contacts 1st Week	0	3	3.9	2.40	1.65	8
	1	19	25.0			
	2	24	31.6			
	3	15	19.7			
	≥ 4	15	19.7			
# of Contacts 2nd Week	0	18	23.7	1.50	1.22	6
	1	23	30.3			
	2	21	27.6			
	3	10	13.2			
	≥4	4	5.4			
# of Contacts 3rd Week	0	28	36.8	.88	.85	3
	1	33	43.4			
	2	11	14.5			
	3	4	5.3			
# of Contacts 4th Week	0	37	48.7	.65	.73	3
	1	30	39.5			
	2	8	10.5			
	3	1	1.3			
	≥4	0	0			
# of Contacts 1st Month	1 - 3	19	25.0	5.43	2.97	18
	4 - 6	32	42.1			
	7 - 9	20	26.3			
	> 10	5	6.5			
# of Contacts 2nd Month	0	27	35.5	1.67	1.74	8
	1	12	15.8			
	2	16	21.1			
	3	10	13.2			
	≥4	11	14.4			
# of Contacts 3rd Month	0	38	50.0	1.15	1.56	6
	1	15	19.7			
	2	11	14.5			
	3	4	5.3			
	≥4	8	10.5			
# of Actual Connections	1 - 3	32	42.9	5.35	3.61	18
	4 - 6	24	31.2			
	7 - 9	9	11.7			
	> 10	11	14.3			
# of Unsuccessful Attempts	0	11	14.3	3.10	2.77	14
	1 - 3	41	53.3			
	4 - 6	18	23.4			
	7 - 9	3	3.9			
	> 10	3	3.9			

Appendix T
Psychometric Assessment Criteria and Summary

Criteria

The reliability and validity was assessed for both the Maternal Satisfaction With Infant Feeding Method Questionnaire (MSIFQ) (Appendix D) and the Perception of Peer Support Questionnaire (PPSQ) (Appendix E). According to DeVellis (1991), a scale has internal consistency when its items are highly intercorrelated. As such, the reliability of the instruments were evaluated by considering the following: (a) Cronbach's alpha coefficient, (b) split-half coefficient, (c) a corrected item-total correlation coefficient, and (d) the alpha estimate when an item was dropped from the scale. To qualify for retention, an item must have met the following criteria: (a) no increase by more than .10 in the coefficient alpha if the item were deleted and (b) a correlation of more than .30 with the total scale score (corrected item-total correlation) (Ferketich, 1991; Nunnally & Bernstein, 1994).

Construct validity was assessed using factor analysis. In particular, exploratory factor analysis was conducted to evaluate the strength of the relationship of individual instrument items with the *a priori* theoretical concepts and to determine the plausible underlying structures of the instruments. Principal components analysis, the most widely applied and recommended first step in factor analysis (Velicer & Jackson, 1990), was chosen since it reveals a great deal about probable number and nature of factors (Tabachnick & Fidell, 1989) and is often viewed as more exploratory in nature. Following initial item assessment, the specific criteria used to guide factor analytic decisions were based on the magnitude of the factor structure loading of an item on one particular factor versus an other, the difference of at least .05 when an item loaded on more than one factor (cleanness), and the conceptual fit of the item with other items on the subscale.

Summary

The Cronbach's alpha coefficients for both the MSIFQ and the PPSQ exceeded the recommended .70 for new instruments (Nunnally & Bernstein, 1994) and both split-half coefficients

were greater than .80. All corrected item-total correlation coefficients except for one were more than .30 and there was no increase by more than .10 in the coefficient alphas if any item were deleted. As such, both instruments have good internal consistency (Ferketich, 1991; Nunnally & Bernstein).

The results of the MSIFQ principal components analysis with varimax rotation yielded a 3-factor solution with eigenvalues greater than one. The three factors were similar to the underlying concepts which originally formed the bases for the MSIFQ. All factors loaded above the recommended .40 criterion and with at least a .05 difference when an item loaded on another factor. A similar principal components analysis with varimax rotation with the PPSQ yielded a 2-factor solution with eigenvalues greater than one. To increase interpretability and the congruence with the theorized content domains (emotional, appraisal, and informational support), a 3-factor solution was requested. The three factors were similar to the underlying structure of the peer support concept. All factors loaded above the recommended .40 criterion and with at least a .05 difference when an item loaded on another factor. However, due to the high factor loadings and multiple item loadings on other factors, it appears that while the underlying theorized peer support domains exist, the instrument is unidimentional in nature. In summary, the preceding analyses gives initial support for the reliability and construct validity for both the MSIFQ and PPSQ instruments.

Appendix U
Psychometric Assessment of the MSIFQ

Reliability

The Cronbach's alpha coefficient for the MSIFQ was .81 and the split-half coefficient was .85, with the alpha for Part One equal to .82 and the alpha for Part Two equal to .85. All corrected item-total correlations were positive and 92% of the items were in the .30 to .70 range. One item ("You felt tied down by the way you were feeding your baby") had a corrected item-total correlation below .30; no item decreased the coefficient alpha by more than .10 if deleted (Table 7).

Table 7

Item Analysis of the MSIFQ

Item	Corrected Item-Total Correlation	Alpha if Item Deleted
While feeding your baby you felt a sense of inner contentment	.54	.79
You felt extremely close to your baby while feeding	.47	.80
Feeding your baby was a very nurturing, maternal experience	.63	.79
You really enjoyed feeding your baby	.68	.79
Feeding was a special time with your baby	.60	.79
How you fed your baby made you feel like a good mother	.47	.80
Feeding soothed your upset or crying baby	.36	.81
You were satisfied with your baby's growth	.39	.80
You are happy with the way you fed your baby	.62	.79
How you fed your baby made you feel more confident as a mother	.60	.79
You felt too tied down by the way you were feeding your baby	.28	.82
You could easily fit your baby's feedings with your other activities	.40	.81

Validity

The result of the initial principal components analysis yielded a 3-factor solution with eigenvalues greater than one in the unrotated matrix. To promote a more parsimonious and interpretable factor solution, a principal components extraction with varimax rotation (orthogonal) was performed (Ferketich & Muller, 1990); based on a scree test (Cattell, 1978) a 3-factor solution was requested (see Figure 6). A factor loading of .30 was required for an item to be retained for further analysis (Nunnally & Bernstein, 1994); this criterion resulted in no immediate deletion of any items.

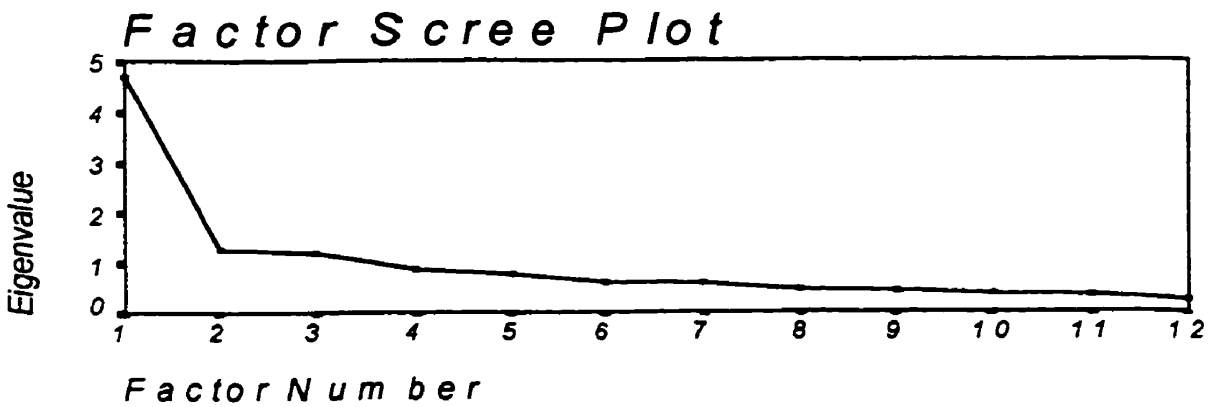


Figure 6. MSIFQ factor Scree plot

Following this initial item assessment, the specific criteria used to guide factor analytic decisions were based on the magnitude of the factor structure loading of an item on one particular factor versus an other, the difference of at least .05 when an item loaded on more than one factor (cleanness), and the conceptual fit of the item with other items on the subscale.

The requested analysis yielded 3 factors with eigenvalues greater than one that explained a total of 59.8% of the variance. Factor I had an eigenvalue of 4.69 which explained 39.0% of the variance and consisted of five items with loadings ranging from .65 to .82. Inspection of the items revealed that Factor I was similar to the theorized maternal enjoyment/role attainment subscale of the MBES scale. Examples of subscale items were "I feel extremely close to my baby while feeding" and "Feeding my baby was a very nurturing, maternal experience" (see Table 8).

Factor II had an eigenvalue of 1.29 and explained 10.8 % of the variance. Five items loaded on this factor with ranging from .53 to .72. Factor II was partially congruent with the theorized infant satisfaction/growth subscale of the MBES scale. This factor included such items as "Feeding soothed my upset or crying baby" and "How I fed my baby made me feel like a good mother"

Finally, Factor III had an eigenvalue of 1.19, accounting for 9.9% of the variance. Two items loaded on this factor with the loadings of .73 and .87. The items are partially similar to the

MBES subscale of lifestyle/maternal body image and included "I felt too tied down by the way I was feeding my baby" and "I could easily fit my baby's feedings with my other activities".

To further assess the complexity of variables, loadings greater than .40 for each variable were inspected across the three factors (Nunnally & Bernstein, 1994; Tabachnick & Fidell, 1989). Three items (25%) were identified that loaded simultaneously on two factors; however, all items loaded cleanly.

Table 8

MSIFQ Items with Principal Components Varimax Factor Loadings

Item	Factors		
	1	2	3
While feeding your baby you felt a sense of inner contentment	**.71**	.23	.09
You felt extremely close to your baby while feeding	**.79**	.07	.02
Feeding your baby was a very nurturing, maternal experience	**.82**	.20	.16
You really enjoyed feeding your baby	**.72**	.29	.30
Feeding was a special time with your baby	**.65**	.41	.02
How you fed your baby made you feel like a good mother	.22	**.69**	.04
Feeding soothed your upset or crying baby	.16	**.53**	.03
You were satisfied with your baby's growth	.06	**.67**	.11
You are happy with the way you fed your baby	.21	**.73**	.29
How you fed your baby made you feel more confident as a mother	.39	**.65**	.09
You felt too tied down by the way you were feeding your baby	.09	.01	**.87**
You could easily fit your baby's feedings with your other activities	.12	.22	**.73**

Appendix V
Psychometric Assessment of the PPSQ

Reliability

The Cronbach's alpha coefficient for the PPSQ was .96 and the split-half coefficient was .96, with the alpha for Part One equal to .91 and the alpha for Part Two equal to .92. All corrected item-total correlations were positive, no items had a corrected item-total correlation below .30, nor did any item decrease the coefficient alpha by more than .10 if deleted (Table 9).

Table 9

Item Analysis of the PPSQ

Item	Corrected Item-Total Correlation	Alpha if Item Deleted
Listen to what you had to say	.78	.95
Show concern about your feelings	.78	.95
Care about how breastfeeding was going for you	.76	.95
Establish a sense of trust	.82	.95
Make you feel that you could call her in times of trouble	.83	.95
Tell you what you could expect in certain breastfeeding situations	.78	.95
Make you feel better after talking to her	.88	.94
Increase your confidence to breastfeed	.77	.95
Provide you with useful information	.82	.95
Give you helpful suggestions to your questions	.83	.95

Validity

The principal components analysis yielded a 2-factor solution with eigenvalues greater than one in the unrotated matrix (see Figure 7). A review of the items showed Factor I was the theorized informational and appraisal support content domains while Factor II was represented by the emotional support items. To promote a more interpretable factor solution, a principal components extraction with varimax rotation (orthogonal) was performed (Ferketich & Muller, 1990); based on *a priori* theorized domains a 3-factor solution was requested. A factor loading of .30 for retention resulted in no immediate deletion of any items. The requested analysis yielded 2 factors with eigenvalues greater than one and all three factors explained a total of 87.4% of the variance. Factor I had an eigenvalue of 7.22 which explained 72.2% of the variance. Five items loaded on this factor, ranging from .63 to .89, and

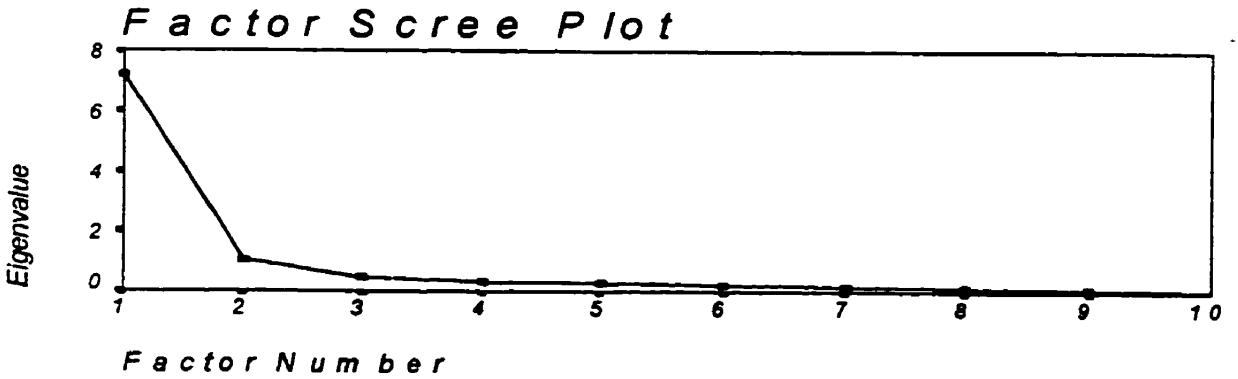


Figure 7. PPSQ factor Scree plot

represented the theorized emotional support content domain (Table 10). Factor II had an eigenvalue of 1.06 and explained 10.6 % of the variance with factor loading ranging from .70 to .85. Inspection of the three items revealed that Factor II was the theorized appraisal support content domain. Finally, Factor III had an eigenvalue of .59 and explained 4.6% of the variance. This Factor consisted of two items with factor loadings of .75 and .81 and was the theorized domain of informational support. To further assess the complexity of variables, loadings greater than .40 for each variable were inspected across the three factors (Nunnally & Bernstein, 1994; Tabachnick & Fidell, 1989). Five items (50%) were identified that loaded simultaneously on two factors; however, all items loaded cleanly.

Table 10

PPSQ Items with Principal Components Varimax Factor Loadings

Item	Factors		
	1	2	3
Listen to what you had to say	**.89**	.24	.26
Show concern about your feelings	**.84**	.33	.21
Care about how breastfeeding was going for you	**.87**	.18	.30
Establish a sense of trust	**.63**	.56	.22
Make you feel that you could call her in times of trouble	**.64**	.49	.35
Tell you what you could expect in certain breastfeeding situations	.22	**.70**	.51
Make you feel better after talking to her	.36	**.74**	.46
Increase your confidence to breastfeed	.25	**.85**	.26
Provide you with useful information	.38	.36	**.81**
Give you helpful suggestions to your questions	.35	.45	**.75**

Note. The stem for each item is "Did your volunteer..."

Appendix W
SPSS Program to Assess for Discrepancies

Question: I have had two operators enter the same data in two files. How do I get SPSS to check the two files for discrepancies?

Answer: Assume 2 presumably identical files of N variables each. Rename vars in 1 file and merge with 2nd file.

```
do repeat v=var_1 to var_n
        /w=var_n+1 to var_n+n
      /e=err_1 to err_n.
        if (v ne w) e=1.
end repeat.
compute newvar=sum(err_1 to err_n).
Select if (newvar>=1).
```

The resulting cases are problematic ones. Compare variable information to original responses and correct your dataset.If no cases result, data entry was consistent across operators.

Here is a syntax job that will illustrate. This example assumes 10 variables compared across two files:

```
* This syntax creates the two example files. * DO NOT USE THIS PART IN YOUR SYNTAX.
input program.
loop.
do repeat #r=var_1 to var_10.
   compute #r=trunc (uniform(5))+1.
end repeat.
end case.
end loop.
end file.
end input program.
exe.
compute id=$casenum.
save outfile = '@first@.sav'.
exe.
If (var_1=5) var_10=3.
save outfile = '@second@.sav'.
exe.
*This syntax and all after you should use. * This syntax merges the files and renames variables.
match files file=*
  /file='@first@.sav'
  /rename (var_1 to var_10 = var_11 to var_20)
  /by id.
exe.
* This syntax does the error checking.
do repeat v=var_1 to var_10
  /w=var_11 to var_20
  /e=err_1 to err_10.
  if (v ne w) e=1.
end repeat.
exe.
*This syntax creates a new file that has only ID and the error variables.
* Use this file to check your data for transcription errors.
compute newvar=sum(err_1 to err_10).
select if (newvar>=1).
save outfile = '@third@.sav'
  /keep id err_1 to err_10.
exe.
get file '@third@.sav'.
```

Appendix X
Frequency of Reasons for Supplementation by Infant Feeding Category

Table 16

Frequency of Reasons for Supplementation by Infant Feeding Category

Reason for Supplementation		Add[a]			Daily[b]			Switch[c]		
Type	Problem	4wk	8wk	12wk	4wk	8wk	12wk	4wk	8wk	12wk
Infant	Feeding		2		4	1		9	2	1
	Infant physical	2	1					5	2	
	Infant behaviour	4	5	2	3	1	2	1		1
Maternal	Breast problem	2			1	2	1	1		
	Insufficient milk supply				11	3	9	13	12	7
	Maternal physical	3			1	1		3	1	1
	Maternal emotional	2	1		2			3	2	
Other	Convenience	1	3	1	2	7	5		1	2
	No expressed milk	3	5	3						
	See if baby would take it	1		8						
	Return to work				3	2	4		2	4

[a] almost and high breastfeeding categories (*add* supplementation on a non-daily basis)
[b] partial breastfeeding category (supplemented *daily*)
[c] token and bottlefeeding categories (*switched* to primarily bottlefeeding)

Appendix Y

Between-Group Comparisons of Reasons for Discontinuing or Supplementing Breastfeeding

Table 17

Between-Group Comparisons of Reasons for Discontinuing or Supplementing Breastfeeding

Rational	4 Weeks		8 Weeks		12 Weeks	
	Peer (N=132) n (%)	Control (N=124) n (%)	Peer (N=122) n (%)	Control (N= 104) n (%)	Peer (N= 112) n (%)	Control (N=93) n (%)
Discontinuation						
Infant problem	4 (3)	11 (8.9)	2 (1.6)	2 (1.9)	1 (1)	1 (1)
Maternal problem	2 (1.5)	5 (4.0)	1 (1)	2 (1.9)	0	1 (1)
Convenience	0	0	0	1 (1)	0	2 (2.2)
Insufficient milk	7 (5.3)	6 (4.8)	6 (4.9)	6 (5.8)	3 (2.7)	4 (4.3)
Return to work	0	0	1 (1)	1 (1)	2 (1.8)	2 (2.2)
Daily supplementation						
Infant problem	3 (2.3)	4 (3.2)	0	2 (1.9)	2 (1.8)	0
Maternal problem	1 (1)	3 (2.4)	3 (2.5)	0	0	1 (1)
Convenience	0	2 (1.6)	6 (4.9)	1 (1)	4 (3.6)	1 (1)
Insufficient milk	4 (3)	7 (5.6)	3 (2.5)	1 (1)	4 (3.6)	4 (4.3)
Return to work	3 (2.3)	0	1 (1)	0	3 (2.7)	1 (1)

Appendix Z
Comparisons of Use of Breastfeeding Supports at 4 Weeks Postpartum

Table 22

Comparisons of Use of Breastfeeding Supports at 4 Weeks Postpartum

	4 Weeks (N = 254)								
Source of Support	Frequency[a]			Intensity[b]			Nature[c]		
	Peer N=132 n (%)	Control N=122 n (%)	χ^2	X	SD	Sum	Baby	Mother	General
Professional									
Breastfeeding Clinic	79 (60)	73 (60)	.00	2.12	3.41	538	110	31	11
Family Physician	56 (42)	50 (41)	.05	1.06	1.82	269	69	34	3
Warmline	31 (23)	28 (23)	.01	.47	1.19	119	37	22	0
Public Health Dept.	10 (8)	9 (7)	.00	.19	.89	47	9	7	3
Pediatrician	9 (7)	11 (9)	.42	.15	.72	37	18	2	0
Lactation Consultant	3 (2)	6 (5)	1.30	.14	1.02	36	8	1	0
Midwife	1 (1)	3 (3)	1.18	.10	.39	22	1	3	0
Social									
Family Member	51 (39)	46 (38)	.02	5.09	9.93	1294	32	32	33
Partner	35 (27)	26 (21)	.94	6.34	12.57	1611	10	20	31
Friend	19 (14)	41 (34)	12.97*	1.97	5.07	500	16	25	19
La Leche League	2 (2)	2 (2)	.01	.03	.33	8	1	2	1
Other	11 (8)	6 (5)	1.18	.22	1.82	56	6	7	4
Books	36 (27)	38 (31)	.46	4.18	9.25	1062	24	22	28

[a] number of women who used source [b] number of times used per month [c] source used for either baby, mother, or general problem.

* $p < .001$

Appendix AA
Comparisons of Use of Breastfeeding Supports at 8 Weeks Postpartum

Table 23

Comparisons of Use of Breastfeeding Supports at 8 Weeks Postpartum

	8 Weeks (N = 226)								
Source of Support	Frequency[a]			Intensity[b]			Nature[c]		
	Peer N=122 n (%)	Control N=104 n (%)	χ^2	X	SD	Sum	Baby	Mother	General
Professional									
Breastfeeding Clinic	21 (7)	25 (24)	1.61	.42	1.10	94	28	14	4
Family Physician	34 (28)	30 (29)	.03	.52	1.30	15	37	26	1
Warmline	6 (5)	9 (9)	1.26	.10	.39	22	10	5	0
Public Health Dept.	3 (2)	0 (0)	2.59	.03	.27	7	2	0	1
Pediatrician	1 (1)	9 (9)	8.15*	.06	.32	14	6	4	0
Lactation Consultant	2 (2)	1 (1)	.20	.20	.22	5	2	1	0
Midwife	0 (0)	2 (2)	2.7	.01	.15	3	0	2	0
Social									
Family Member	32 (26)	21 (20)	1.14	2.84	7.25	639	18	15	20
Partner	14 (12)	14 (13)	.20	2.71	8.11	609	5	9	14
Friend	12 (10)	16 (15)	1.59	.95	3.92	214	10	9	9
La Leche League	N/A	N/A	N/A						
Other	3 (2)	2 (2)	.07	.02	.15	5	4	1	0
Books	13 (11)	17 (16)	1.58	1.47	7.53	333	14	7	9

[a] number of women who used source [b] mean number of times used per month [c] source used for either baby, mother, or general problem.

* $p < .000$

Appendix BB
Comparisons of Use of Breastfeeding Supports at 12 Weeks Postpartum

Table 24

Comparisons of Use of Breastfeeding Supports at 12 Weeks Postpartum

	12 Weeks (N = 205)								
Source of Support	Frequency[a]			Intensity[b]			Nature[c]		
	Peer N=112 n (%)	Control N=93 n (%)	χ^2	X	SD	Sum	Baby	Mother	General
Professional									
Breastfeeding Clinic	4 (4)	12 (13)	6.15*	.15	.66	31	6	9	1
Family Physician	13 (12)	17 (18)	1.81	.19	.48	38	17	12	1
Warmline	2 (2)	2 (2)	.04	.03	.24	6	2	2	0
Public Health Dept.	0 (0)	1 (1)	1.21	.01	.14	2	1	0	0
Pediatrician	3 (3)	3 (3)	.05	.03	.21	7	4	2	0
Lactation Consultant	0 (0)	1 (1)	1.21	.00	.07	1	1	0	0
Midwife	N/A	N/A	N/A						
Social									
Family Member	17 (15)	11 (12)	.27	1.36	4.85	277	7	12	9
Partner	9 (8)	7 (8)	.02	1.78	7.09	363	1	7	8
Friend	14 (13)	12 (13)	.01	.80	3.62	164	8	14	4
La Leche League	0 (0)	1 (1)	1.2	.00	.07	1	0	1	0
Other	3 (3)	5 (5)	.99	.11	.88	22	2	6	0
Books	11 (10)	12 (13)	.48	.87	3.88	178	10	10	3

[a] number of women who used source [b] number of times used per month [c] source used for either baby, mother, or general problem.

* $p = .01$

Appendix CC
Relationship Between Peer Volunteer Activities and Infant Feeding Category

Table 27

Relationship Between Peer Volunteer Activities and Infant Feeding Category

Peer Volunteer Activity	Infant Feeding Category (N = 78)					
	4 Weeks		8 Weeks		12 Weeks	
	r_s	p	r_s	p	r_s	p
# of days after hospital discharge peer 1st contact	-.03	ns	-.05	ns	-.07	ns
# peer overall contacts (connections & attempts)	-.08	ns	-.05	ns	.05	ns
# peer overall connections (interaction with mother)	-.11	ns	-.13	ns	.01	ns
# peer overall attempts (no interaction with mother)	.00	ns	.07	ns	.05	ns
# peer contacts 1st week	.03	ns	-.01	ns	-.07	ns
# peer contacts 2nd week	.15	ns	.11	ns	.06	ns
# peer contacts 1st month	.11	ns	.08	ns	.10	ns
# peer contacts 2nd month	-	-	-.11	ns	.03	ns
# peer contacts 3rd month	-	-	-	-	-.06	ns
# days the peer/mother relationship continued	-.26	.02	-.20	ns	-.05	ns

Appendix DD
Relationship Between Peer Activities, Maternal Satisfaction with Infant Feeding, and Maternal Perception of Peer Support

Table 28

Relationship Between Peer Activities, Maternal Satisfaction with Infant Feeding, and Maternal Perception of Peer Support

Peer Volunteer Activity	Maternal Perceptions (N = 78) MSIFQ		PPSQ	
	r_s	p	r_s	p
# of days after hospital discharge peer made 1st contact	-.11	ns	-.13	ns
# peer overall contacts (connections & attempts)	.20	ns	.34	.002
# peer overall connections (interaction with mother)	.17	ns	.43	.000
# peer overall attempts (no interaction with mother)	.09	ns	.05	ns
# peer contacts 1st week	.12	ns	.14	ns
# peer contacts 2nd week	.06	ns	.04	ns
# peer contacts 1st month	.08	ns	.16	ns
# peer contacts 2nd month	.30	.008	.29	.01
# peer contacts 3rd month	.09	ns	.25	.03
# days the peer/mother relationship continued	.16	ns	.24	.03

Appendix EE
Relationship Between Peer Volunteer Activities and Breastfeeding Problems

Table 29

Relationship Between Peer Volunteer Activities and Breastfeeding Problems

Peer Volunteer Activity	4 Weeks (n = 79)			8 Weeks (n = 74)			12 Weeks (n = 70)		
	Baby	Mom	Total	Baby	Mom	Total	Baby	Mom	Total
	r	r	r	r	r	r	r	r	r
# of days after hospital discharge 1st contact	-.12	-.02	-.07	.08	-.08	.01	.15	.03	.11
# peer overall contacts	.01	-.10	-.07	-.11	-.08	-.12	.08	-.08	-.06
# peer overall connections	.01	-.05	-.05	-.09	-.12	-.13	.06	-.15	-.11
# peer overall attempts	.04	-.12	-.04	-.10	.00	-.06	.05	.05	.03
# peer contacts 1st week	.14	-.12	-.01	-.08	-.10	-.10	-.18	-.08	-.16
# peer contacts 2nd week	.02	-.11	-.07	-.12	.02	-.04	.10	.03	.08
# peer contacts 1st month	.06	-.06	-.03	-.15	-.05	-.12	-.03	-.06	-.08
# peer contacts 2nd month	-	-	-	-.08	-.05	-.09	.08	-.10	-.06
# peer contacts 3rd month	-	-	-	-	-	-	.15	-.05	-.00
# days peer/mother relationship	-.08	-.14	-.12	-.01	-.05	-.06	.07	-.09	-.07

Note. p = ns

Appendix FF
Variables Not in Regression Equation

Table 33

Variables Not in Regression Equation

Variables	Score (df = 1)	p
Maternal age	.01	.92
Maternal education	.14	.71
Income	.66	.42
Smoking before pregnancy	2.41	.12
Smoking during pregnancy	3.66	.06
Decision to breastfeed	2.22	.14
Prenatal class attendance	1.20	.27
age*education	.10	.75
age*marital status	.24	.62
age*smoke before pregnancy	.05	.82
age*smoke during pregnancy	.02	.90
age*decision to breastfeed	1.69	.19
age*prenatal class attendance	.01	.94

Appendix GG

Statistical Comparison of Non-Significant Variables In and Not In the Regression Equation

Table 34

StatisticalComparison of Non-Significant Variables In and Not In the Regression Equation

Variable	In Equation		Not in Equation	
	Wald	p	Score	p
Maternal age	.01	.91	.01	.92
Maternal education	.21	.64	.14	.71
Income	.65	.42	.66	.42
Smoking before pregnancy	2.35	.13	2.41	.12
Smoking during pregnancy	3.02	.08	3.66	.06
Decision to breastfeed	3.06	.08	2.22	.14
Prenatal class attendance	2.01	.16	1.20	.27
Age*education	.27	.60	.10	.75
Age*marital status	.15	.70	.24	.62
Age*smoke before pregnancy	.02	.88	.05	.82
Age*smoke during pregnancy	.00	.96	.02	.90
Age*decision to breastfeed	2.29	.13	1.69	.19
Age*prenatal class attendance	.00	.95	.00	.94