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The Effect of Prenatal Education on Maternal Breastfeeding Self-Efficacy and Breastfeeding Duration

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The Effect of Prenatal Education on Maternal Breastfeeding Self-Efficacy and Breastfeeding Duration

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Thesis submitted to the
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Legend

ABM - artificial baby milk (formula)

AWHONN - Association of Women's Health, Obstetric and Neonatal Nurses

BSES - Breastfeeding Self-Efficacy Scale (original)

BSES-SF - Breastfeeding Self-Efficacy Scale - Short Form (revised)

EBM - expressed (pumped) breastmilk

IBCLC - International Board Certified Lactation Consultant

IBLCE - International Board of Lactation Consultant Examiners

JOGNN - Journal of Obstetric, Gynecological, and Neonatal Nursing

WHO - World Health Organization

Abstract

Breastfeeding has benefits for mothers and their infants. Most Canadian women initiate breastfeeding but about a third wean their infants in the early weeks. Maternal breastfeeding self-efficacy, defined as the confidence a woman has in her ability to breastfeed, seems to be positively related to the continuation of breastfeeding. The purpose of this study was to determine the effect of a prenatal intervention on maternal breastfeeding self-efficacy and on breastfeeding duration. The theoretical underpinnings of the intervention are Bandura's theory of self-efficacy and adult learning principles.

This thesis describes the development of a curriculum for a prenatal breastfeeding workshop and the randomized controlled trial that was completed to test the hypotheses that the workshop would have a positive influence on maternal breastfeeding self-efficacy and that increased self-efficacy would positively affect breastfeeding duration. Breastfeeding self-efficacy, measured with the Breastfeeding Self-Efficacy Scale-Short Form, and breastfeeding duration, recorded as number of days and amount of breastfeeding, were measured at 4 and 8 weeks postpartum.

The results of this study suggest that the prenatal breastfeeding workshop had a positive effect on maternal breastfeeding self-efficacy and on the amount women were breastfeeding. Over time, maternal breastfeeding self-efficacy scores increased in both groups with the intervention group having higher scores. At week 4, there was a significant difference in scores (control, M = 53.38 (SD = 9.1); intervention, M = 57.98 (SD = 8.6), t(78) = -2.32, p = .023, d = .523, CI -8.53, -0.65). At week 8, there was a difference in scores but, given the small sample size, these were not statistically

significant (control, M = 58.91 (SD = 9.1); intervention, M = 61.70 (SD = 5.8), t(72) = -1.60, p = .115, *d* = .412). Although there was little difference between the groups in the number of days of breastfeeding, the intervention group had more exclusive breastfeeding (70% vs. 58%) and less weaning (15% vs. 22%) when compared with the control group. The most common reason for weaning was insufficient milk supply.

Overall, the results indicate the intervention positively supported the breastfeeding women. Further research is recommended to determine optimal timing and delivery and the critical aspects of the workshop; to explore the relationship between maternal self-efficacy and breastfeeding duration; and to establish the workshop's effects over the first six months postpartum.

Acknowledgements

I have not worked alone on this thesis. It is the culmination of many years of experiences. I have learned from teachers and colleagues and from the women and babies that I have had the privilege to know. It was a crooked path to get to this point, but always the desire to help women who wanted to breastfeed has inspired me. Unfortunately, I cannot name all of the people who have contributed to my learning, who have mentored me, and who have helped me develop my skills. At this time, I would like to acknowledge the individuals who contributed most directly to this thesis.

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I would like to thank staff from the Ottawa Hospital, especially Susan McDowell, Ginette Saumure and Marlene Ghattas, for their support with the study. As well, I would like to thank the doctors and nurses at the Ottawa Hospital who helped with recruiting.

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Chapter One - Introduction

Background

The Clinical Issue

Breastfeeding provides many benefits to mothers and their infants. Fewer incidences of osteoporosis, ovarian cancer, and premenopausal breast cancer are reported for women who have breastfed (Bernier, Plu-Bureau, Bossard, Ayzac, & Thalabard, 2000; Labbok, 2001; Lawrence & Lawrence, 1999). The nutrients, growth factors, and immunological components a healthy term infant requires are provided in breastmilk and fewer illnesses are reported for breastfed infants (Bachrach, Schwarz, & Bachrach, 2003; Duffy, Faden, et al., 1997; Oddy et al., 2003; Riordan, 2005; Scariati, Gummer-Strawn, & Fein, 1997; Young et al., 2002). Exclusive breastfeeding is recommended for the first six months of life and continued breastfeeding with complementary foods is recommended for the first two years and beyond (Health Canada, 2004; Kramer & Kakuma, 2002; World Health Organization [WHO], 2002).

Breastfeeding initiation rates are defined as the percentage of women who begin breastfeeding at the time of their infants' birth. The 2000 Ottawa Infant Care Survey found breastfeeding initiation rates in Ottawa were about 89% (Family Health Community Services [FHCS], 2002). Unfortunately, breastfeeding duration, defined as the length of time the infant is breastfed, was not at the level recommended by Health Canada (2004) and the WHO (2002). Of the women initiating breastfeeding, 63% were exclusively breastfeeding at three months and 32% were exclusively breastfeeding at six months (FHCS, 2002). The Family Centered Maternity Care Survey 2000, a

cross-sectional telephone survey of 599 mothers in the City of Ottawa, found the overall bottle-feeding rate increased from 11.4% at birth to 28.5% at six weeks postpartum (Potter, 2003).

National statistics substantiate the City of Ottawa numbers. About 85% of Canadian women initiate breastfeeding, with provincial rates ranging from 62.7% to 93.3% (Statistics Canada, 2003). Around one third of breastfeeding infants are weaned by eight weeks postpartum and only about 20% are exclusively breastfeeding at six months (Millar & Maclean, 2005; Statistics Canada). The majority of women describe problems such as lack of milk, sore nipples, inconvenience, and fatigue as the primary reasons for stopping (Health Canada, 1999; Millar & Maclean).

The breastfeeding initiation rates indicate breastfeeding promotion programs have made a significant impact and more women are choosing to breastfeed their infants at birth. Increased initiation rates are not helpful if breastfeeding does not continue for an optimal length of time. The reasons given for weaning reveal that stopping is often not maternal choice but a matter of mothers perceiving the problems to be insurmountable (Health Canada, 1999). There is a need for interventions to support these breastfeeding mothers.

The Original Pilot Study

This study was developed from a pilot that was completed in 2002 by a nurse who received an Advanced Clinical Fellowship from the Registered Nurses Association of Ontario (Bassett, Dumas, & Mayrand-Leclerc, 2002). The original pilot study was based on an identified problem of early weaning. The research question was, "Does a prenatal intervention designed specifically to incorporate elements that contribute to self-efficacy

in breastfeeding, help to build a woman's breastfeeding confidence and ultimately affect breastfeeding outcomes?"

In the original pilot study, a convenience sample of sixteen families was recruited through the offices of midwives, family doctors, and obstetricians. Eight families formed the experimental group and eight families formed the comparison group (Bassett et al., 2002). The experimental group participated in a two and a half hour prenatal education session. Breastfeeding self-efficacy was measured at the end of the prenatal education session (intervention group only), 24 hours post-birth, and at four weeks postpartum using the Breastfeeding Self-Efficacy Scale (Bassett et al; Dennis & Faux, 1999).

The results of the original pilot study determined there were no differences between the two groups in self-efficacy at birth. There were statistically significant increases in the self-efficacy scores over time in both groups (Bassett et al., 2002). The prenatal intervention appeared to positively influence maternal perception of milk sufficiency and breastfeeding outcomes at four weeks. Included in the results of the original pilot were recommendations for future research including replication with a larger sample and further study of the nature of breastfeeding confidence and its relationship to breastfeeding duration.

Current Literature

The identified clinical issue and the results of the original pilot indicated that a larger study to determine the effects of prenatal education on maternal breastfeeding self-efficacy and breastfeeding duration was justified. Current literature on the topic was searched to develop a proposal for such a research study.

Maternal confidence has been studied and appears to contribute positively to increased breastfeeding duration (Chezem, Friesen, & Boettcher, 2003; Dunn, 2002). More specifically, maternal breastfeeding self-efficacy, the confidence a woman has in her ability to breastfeed, is a modifiable factor positively related to breastfeeding duration (Blyth et al., 2002; Blyth et al., 2004; Dennis, 1999). Self-efficacy theory proposes that the more efficacious a woman feels about breastfeeding the more likely she will be committed to and sustain her efforts to breastfeed (Bandura, 1994; Dennis).

The literature also supports prenatal interventions as a means to increase breastfeeding duration (Cox & Turnbull, 1998; Kistin, Benton, Rao, & Sullivan, 1990; Pugin, Valdés, Labbok, Pérez, & Aravena, 1996). Didactic, cognitive-based classes were not very successful, but classes with a hands-on component had positive results (Duffy, Percival, & Kershaw, 1997; Hill, 1987; Pugin et al.).

The literature suggested it would be worthwhile to design a prenatal intervention with the intention of increasing maternal breastfeeding self-efficacy. Since self-efficacy is the element of interest, Bandura's theory of self-efficacy (1977) was used as the basis to design the prenatal intervention. In addition to self-efficacy theory, adult learning principles were considered when the curriculum was designed.

Adult learning principles suggest that adults come to learning situations with previous experience and learn best when learning is relevant, goal-oriented, and individualized (Brookfield, 1991; Knowles, 1980). The mothers did not have previous infant feeding experience but they had other life experiences to draw on. The curriculum was planned to provide individualized, relevant learning by covering basic breastfeeding information and by answering the women's questions.

The Thesis

Research Question and Hypotheses

The research question was, "What is the effect of prenatal education on maternal breastfeeding self-efficacy and breastfeeding duration?"

The first hypothesis was that a prenatal breastfeeding workshop using the theory of self-efficacy and adult learning principles would increase maternal breastfeeding self-efficacy in the early postpartum period (see Figure 1).

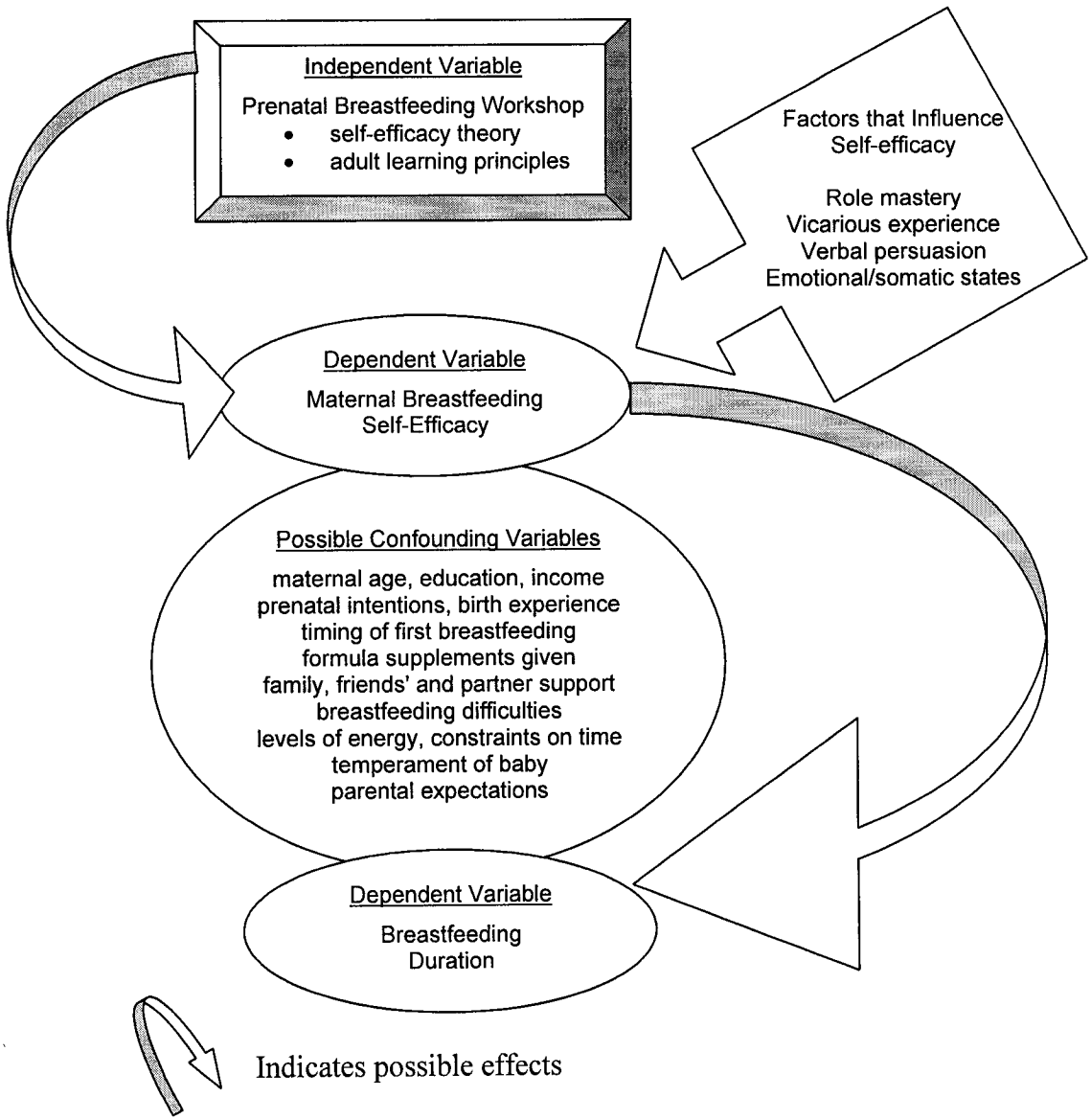

Figure 1 Schematic Diagram of Variables

A second hypothesis was that increased maternal breastfeeding self-efficacy would result in increased breastfeeding duration.

The Study Design

This study was designed as a randomized controlled trial (see Figure 2). The prenatal breastfeeding workshop was the intervention. Maternal breastfeeding self-efficacy and breastfeeding duration, recorded at registration and at four and eight weeks postpartum, were the variables measured. It was a balanced design in terms of the number of time points when subjects in the experimental and control groups were compared.

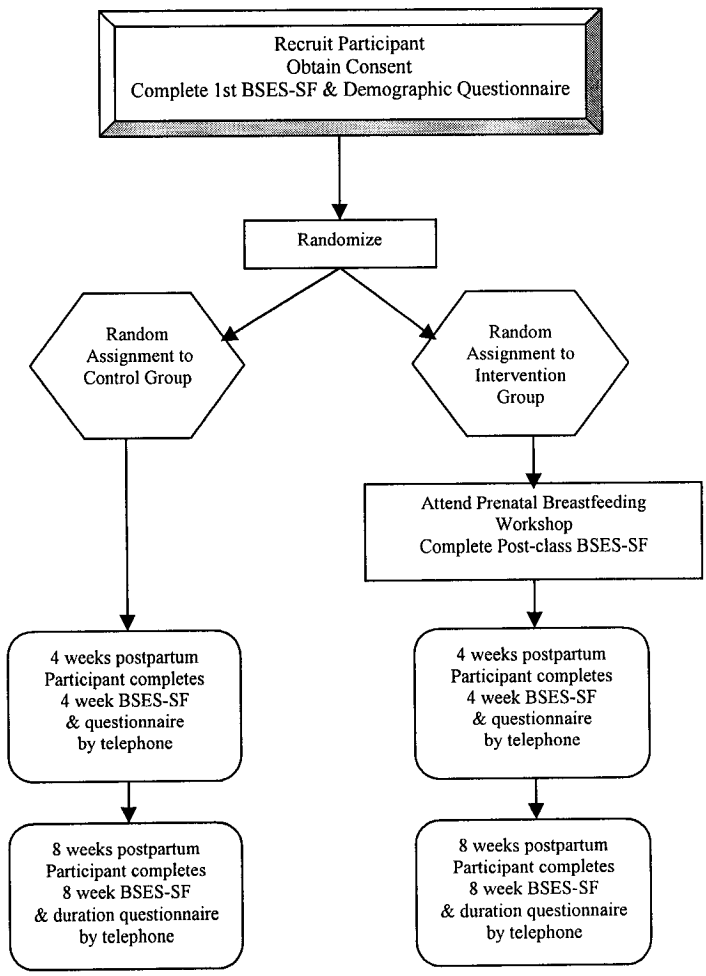

Figure 2 Schematic of Study Design

The Study

Ethics and agency approval was obtained before recruitment started (see Appendix A). First, The Ottawa Hospital Research Ethics Board approved the study. Because this work is part of a graduate degree at the University of Ottawa, the study was also approved by the university's research ethics board. Permission to use the Breastfeeding Self-Efficacy Scale-Short Form was obtained from Dr. Dennis and permission to use the positioning pictures was obtained from Tamalyn Roberts (see Appendix B). Agency approval was sought from the medical and nursing staff at the Ottawa Hospital including the multidisciplinary perinatal committee. Following ethics and agency approval, a letter of introduction from the department head was sent to the doctors and midwives who have privileges at the Ottawa Hospital.

With agency approval, the researcher received a list of the obstetricians, family doctors, and midwives who practiced at the Ottawa Hospital. Pamphlets and posters were used to announce the study and a telephone line was established for registering participants (see Appendix C). Due to slow recruitment and two topics missed on the demographic questionnaires, amendments were sought from The Ottawa Hospital Research Ethics Board (see Appendix D). These changes increased registration and clarified questions about maternal breast surgery and receiving free formula samples.

The registration package included a participant information sheet inviting primiparous women to join and explaining the study (see Appendix E). There were two copies of the consent form (see Appendix F). One was to be completed and given to the researcher and the other was for the participant to keep. Contact information, the prenatal

demographic questionnaire, and a baseline BSES-SF were completed and handed in with the consent form in a sealed manila envelope (see Appendices G, H and I).

Developing the workshop and finding appropriate dolls were challenging aspects of the study. Dolls were purchased and altered to approximate the weight and feel of a newborn. The PowerPoint® presentation and videos used for the original pilot study's prenatal education session formed the base of the workshop. Positioning pictures were found and permission to use them was obtained (Appendix B). Breastfeeding information handouts were purchased from La Leche League Canada. Because several changes had been made to the original PowerPoint® presentation, it was decided to form a pilot group to test the revised curriculum. Two workshops, one Thursday evening and one Saturday morning, were offered to, and completed with, this pilot group of nine participants. Except for correcting problems with the multimedia equipment, there were no major changes to the curriculum following the classes with the pilot group.

Before and after each workshop, participants completed short questionnaires (see Appendices J and K). The before-workshop questions were intended to assess learners' needs and to ensure their questions were answered. The after-workshop questions were intended to determine what had been helpful and what changes might be suggested.

Data Collection

All week 4 demographic questionnaires and week 4 and week 8 duration and BSES-SF questionnaires were completed by telephone (see Appendices L, M and N). The telephone calls were made by a research assistant who was unaware of the participant's group allocation. The telephone method accounts for the high rate of completed questionnaires. Only 2 of the 110 registered participants were lost due to the

research assistant being unable to reach them by telephone. The primary investigator and a research assistant each built a database and comparisons were made to ensure accuracy. All data analyses were completed using SPSS 12.0.

Organization of the Thesis

This thesis consists of five chapters and is article-based. Two of the chapters are designed as stand-alone journal articles and the other three chapters support these articles. Due to the article-based nature of this thesis, there is some overlap of information. Each chapter has its own reference list and, when appropriate, its own abstract and appendices. All chapters maintain continuous page numbering.

Chapters three and four are the journal articles. Chapter three describes development of the curriculum for the prenatal breastfeeding workshop and chapter four reports the randomized controlled trial. These two chapters have been written to the specifications of a peer-reviewed professional journal with the goal of submitting the articles for publication (Association of Women's Health, Obstetric and Neonatal Nurses [AWHONN], 2005). These specifications require numbering of each line in the text.

Chapters one, two, and five are the introduction, the overview of the literature, and the conclusions and recommendations, respectively. They support and augment the two journal articles. These are written to the specifications of the University of Ottawa thesis guide (Faculty of Graduate and Postdoctoral Studies, 2004).

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Chapter Two - Overview of the Literature

Search Strategy

A computerized search of the research literature was completed using CINAHL, Medline, psycINFO, and the Cochrane Library databases. Proquest Nursing Journals, psycARTICLES, and Elsevier were accessed via the Ontario Scholars Portal through the University of Ottawa proxy. Dates and language were not restricted. Several searches were completed from October 2003 to May 2005. Names of authors of retrieved journal articles were subsequently entered into databases to ensure a thorough literature search.

The internet was searched using Google's search engine. Websites for Health Canada, the Canadian Institute for Health Information, the Canada Perinatal Nutrition Program, the Registered Nurses Association of Ontario, the Perinatal Partnership Program of Eastern and Southeastern Ontario, the Association of Women's Health, Obstetric and Neonatal Nurses, and the World Health Organization were searched. Statistical data was requested and received from Publications Health Canada and Statistics Canada. Retrieved PDF documents were searched for whole words using the PDF search feature.

All searches were completed with Boolean operators using the terms: breastfeeding, self-efficacy, confidence, duration, prenatal, antenatal, education, health education, adult education, and/or support. Relevant literature belonged to one of five categories: 1) factors that affect breastfeeding duration; 2) maternal breastfeeding self-efficacy/confidence; 3) prenatal/antenatal breastfeeding education; 4) self-efficacy theory; and 5) adult learning principles.

Search Results

Factors that Affect Breastfeeding Duration

For the purposes of this paper breastfeeding duration is considered a measurement of breastfeeding success. While the author appreciates that success is a subjective term and one woman's perceived *success* may be another woman's perceived *failure*, the clinical issue identified has been early weaning and, therefore, breastfeeding duration - the length in time and amount of breastfeeding - is one of the measurements of interest.

Literature about factors that affect breastfeeding duration served two purposes for this thesis. First, it was the rationale for developing a prenatal breastfeeding workshop. The literature supports both the importance of increasing maternal confidence and the assumption that there are factors that can be influenced by professional support. The second reason for understanding the multiple factors that affect breastfeeding duration is to be able to account for possible confounding variables when building the demographic questionnaires and analyzing the data.

Results from surveys completed by Statistics Canada provided insight into factors that affect breastfeeding duration and comprehensive reports of these survey results were available in 1999 and 2005 (Health Canada, 1999; Millar & Maclean, 2005). Maternal age and education level, family income, and marital status are positively related to increased breastfeeding duration (Health Canada; Millar & Maclean). In other words, the higher a woman's age, her level of education, her family income, and the more stable her marital situation the more likely it is that the woman will breastfeed. Of course, these factors are not likely to be influenced by professional support for breastfeeding.

Although, by knowing this demographic information, healthcare providers may be able to identify vulnerable populations.

When women were asked in the Statistics Canada surveys, their reasons for weaning before six months postpartum remained quite constant. Lack of milk (31%), inconvenience and fatigue (15%), and difficulty with technique (13%) were the three top reasons reported by mothers (Health Canada, 1999; Millar & Maclean, 2005). It is important to note that these are the mothers' perceptions and, without minimizing a woman's pain or anxiety, there may actually have been enough milk or it might have been a problem that, with enough help, could have been overcome.

Blyth et al. (2004) differentiate between non-modifiable and modifiable factors that affect breastfeeding duration. The authors completed a prospective, longitudinal study with 300 women. They used questionnaires in the last trimester and assessed infant feeding methods at 1 week and 4 months postpartum. Intended length of breastfeeding and breastfeeding self-efficacy seemed to be the most significant variables that influenced breastfeeding duration (Blyth et al.).

Other researchers have found modifiable factors that contribute to positive breastfeeding outcomes and these include, but are not limited to, developing breastfeeding skills, providing breastfeeding information, and encouraging partner/familial support (Cerandas, Noceda, Barrera, Martinez, & Garsd, 2003; McLeod, Pullon, & Cookson, 2002; Scott & Binns, 1999). O'Campo, Faden, Gielen, & Wang (1992) found the mother's perception of the benefits, convenience, and naturalness of breastfeeding, and her perceptions that other people want her to breastfeed affected outcome.

Lawson and Tulloch (1995) found that the number of feeding problems did not affect continuation of breastfeeding as much as the timing of the first feeding and the amount of mother-infant contact in the first 72 hours. On the other hand, in a phenomenological study, Mozingo, Droppleman, and Merideth (2000) identified the clash between highly idealized expectations and early problems as a contributing factor in early weaning.

These study results emphasize the effect of maternal attitude and the need for professionals to give attention to modifiable factors. According to these results, professional support should be directed to helping women develop realistic expectations and to helping women overcome early problems.

Maternal Breastfeeding Self-Efficacy/Confidence

In the literature, the terms *maternal confidence* and *maternal breastfeeding self-efficacy* seem to be used interchangeably. Bandura (1997) distinguishes between self-efficacy and confidence. According to Bandura, self-efficacy is a construct within a theoretical framework, whereas confidence is a catchall phrase with a colloquial, nonspecific meaning that indicates a strength in belief without specifying what the belief is about. Self-efficacy definitions, related to a specific task, often refer to confidence *in the ability to* complete a particular task (Dennis, 1999; Parjares, 2003). The term *confidence* used in such a definition signifies what the belief is about and it is not just about the strength of the belief.

For purposes of this thesis, maternal breastfeeding self-efficacy is defined as the confidence a woman has in her ability to breastfeed (Dennis, 1999). Although studies

using the term *confidence* may be significant to this thesis, it is specifically the concept of maternal breastfeeding self-efficacy that is being studied.

Literature on maternal breastfeeding confidence and maternal breastfeeding self-efficacy is compelling. There is strong evidence that postpartum maternal confidence/self-efficacy is positively correlated to breastfeeding duration (Blyth et al., 2002; Blyth et al., 2004; Chezem, Friesen, & Boettcher, 2003; Dunn, 2003; Ertem, I. O., Votto, N., & Leventhal, J. M., 2001; O'Campo et al. 1992; Papinczak & Turner, 2000). In other words, the higher a woman's confidence or the more efficacious a woman feels about breastfeeding then the more likely she is to continue breastfeeding.

O'Campo et al. (1992) were among the first to recognize maternal confidence was a factor in breastfeeding outcomes. They completed a prospective study with 198 women to examine the psychosocial, demographic, and medical factors that may increase duration. The results showed that maternal confidence was a significant predictor of breastfeeding duration (RR = 3.06, CI 95%, 1.39, 6.76).

Papinczak & Turner (2000) collected quantitative and qualitative data from 159 mothers using three questionnaires over a six month postpartum period. They determined that overall social health, including breastfeeding self-confidence, was positively related to breastfeeding duration.

Ertem et al. (2001) studied the prevalence and correlates of early cessation of breastfeeding with 64 mothers eligible for the Women, Infants, and Children Program (WIC) in the United States. Maternal lack of confidence and maternal belief that infants preferred formula were major variables contributing to early weaning. The authors recommended shifting from interventions aimed at increasing maternal knowledge and

managing early problems to increasing maternal confidence and addressing maternal beliefs about infant preferences.

Chezem et al. (2003) completed a prospective study with 74 women to explore the relationship between breastfeeding knowledge, breastfeeding confidence, and infant feeding plans on infant feeding practices. They used telephone interviews prenatally, at 6 weeks, at 3 months, and at 6 months postpartum. The focus of their study was to determine the effect of prenatal feeding plans on postpartum breastfeeding practices, but they also determined that breastfeeding knowledge was strongly correlated to breastfeeding confidence and breastfeeding duration.

Dunn (2003) completed a secondary analysis of the Family Centered Maternity Care Survey 2000 to determine vulnerability factors that affect breastfeeding outcomes. Her analysis showed that maternal confidence was the most influential vulnerability factor.

Blyth et al. (2002) completed a longitudinal, prospective study of 300 pregnant, Australian women. Data was collected in the last trimester and at one week and four months postpartum. The data included the Breastfeeding Self-Efficacy Scale (Dennis & Faux, 1999). Their conclusions were that maternal self-efficacy is a significant predictor of breastfeeding duration and they further speculated that increased self-efficacy would ensure mothers will persevere if faced with difficulties (Blyth et al., 2002).

Also of interest is a study by McCarter-Spaulding and Kearney (2001). They investigated the relationship between parenting self-efficacy and the perception of insufficient breastmilk and found a significant negative correlation ($r = -.487$, $p < .01$). The implication seems to be that increasing parenting self-efficacy will result in a

decrease in perceived milk insufficiency. Perceived milk insufficiency has been identified as a contributing factor to premature weaning (Health Canada, 1999; Millar & Maclean, 2005).

It should be noted that Lawson and Tulloch (1995) determined that prenatal confidence does not seem to be a predictor of postpartum success. A key point about this study is that participants were asked prenatally about their confidence if faced with difficulties such as premature birth or low milk supply (Lawson & Tulloch). The women were not asked about their confidence in their ability to breastfeed given healthy, normal conditions (Lawson & Tulloch).

This literature suggests that if a woman feels confident in her ability to breastfeed then there may be a positive effect on breastfeeding duration. This supports efforts for healthcare professionals to try to help women increase their breastfeeding self-efficacy. It also supports developing a prenatal breastfeeding workshop with a goal of increasing maternal breastfeeding self-efficacy.

Prenatal/Antenatal Breastfeeding Education

A meta-analyses reported that prenatal group education was effective (de Oliveira, Camacho, & Tedstone, 2001). As well, individual studies suggest appropriate prenatal breastfeeding education programs contribute to increased duration (Cox & Turnbull, 1998; Kistin, Benton, Rao, & Sullivan, 1990; Pugin, Valdés, Labbok, Pérez, & Aravena, 1996). Specifically, programs with hands-on demonstrations positively affected duration (Duffy, Percival, & Kershaw, 1997; Pugin et al.). Appealing to the practical and affective domains of learning seems to be more important than if the education session is led by professionals or peers (Sheehan, 1999).

In a classic randomized controlled trial, Hill (1987) determined prenatal education did not affect duration. It would seem from the description, the program offered in this study was primarily didactic and centred on cognitive learning (Hill).

Literature on maternal breastfeeding self-efficacy and prenatal interventions supported the original pilot study results and justified a larger study to determine the effects of prenatal education on maternal breastfeeding self-efficacy and breastfeeding duration.

Self-Efficacy Theory

Self-efficacy is a key concept in Bandura's Social Cognitive Theory (Bandura, 1986; Pajares, 2002). Self-efficacy is the belief one holds in one's ability to accomplish a task (Bandura). Self-efficacy influences the choices one makes and how one feels about facing a challenge (Bandura). The higher a person's self-efficacy, the more likely effort will be exerted and persistence will be sustained in an effort to succeed (Bandura). Self-efficacy may also influence cognitive perceptions that hamper or facilitate completing tasks, the stress or depression experienced in difficult situations, resilience when dealing with hardships, or the level of success achieved (Bandura, 1997).

Bandura (1977) differentiates between efficacy expectations and outcome expectations. An efficacy expectation is one's belief in his/her ability to perform a task and an outcome expectation is one's belief that a particular behaviour will result in a specific outcome (Bandura). An individual may believe an action (outcome expectation) will provide a desired outcome but may lack the belief in his/her ability (efficacy expectation) to perform the action (Bandura).

Also, Bandura (1997) distinguishes between the constructs of self-efficacy

and self-concept. Self-efficacy beliefs are judgements of confidence in one's abilities and self-concept is a judgement of self-worth (Bandura). Self-efficacy, unlike self-concept, may be task-specific and may be in reference to a certain goal (Bandura). In the end, Bandura suggests that self-efficacy asks, "Can I do it?", and self-concept asks, "Who am I and what is my worth?".

Self-efficacy is often used as the framework for predicting health behaviour and initiating health promotion (Bandura, 1998; Maibach & Murphy, 1995; Strecher, DeVellis, Becker & Rosenstock, 1986). The concept of self-efficacy can be used to study maternal breastfeeding self-efficacy (Blyth et al., 2002; Blyth et al., 2004; Clevelend, 1999; Creedy et al., 2003; Dennis, 1999).

According to Bandura (1977, 1994), the four sources that inform efficacy expectations are: performance accomplishments, vicarious experience, verbal persuasion, and emotional/physiological arousal. These four sources may be applied to establishing a successful breastfeeding experience (Dennis, 1999).

Performance accomplishment, or role mastery, would mean as a woman is successful with the act of breastfeeding then she builds her confidence in her ability to breastfeed (Bandura, 1977; Bandura, 1994; Dennis, 1999). Vicarious experience, or learning by seeing others accomplish a task, requires that a woman sees breastfeeding modelled by other mothers (Bandura; Dennis). Verbal persuasion from a credible source can help increase a woman's confidence in her ability to breastfeed (Bandura; Dennis). The emotional/physiological mode is worked on by reducing anxiety and correcting any possible faulty beliefs (Bandura, personal communication, May 6, 2004).

The goal of this prenatal intervention was to increase maternal breastfeeding self-efficacy. These four sources of self-efficacy formed the basis of the prenatal breastfeeding workshop. To provide a framework to develop the curriculum for the prenatal breastfeeding workshop, the author completed a literature search for elements of successful adult learning.

Adult Learning Principles

This prenatal intervention involved adults and incorporating adult learning principles into the prenatal breastfeeding workshop was logical. Adults come to a learning situation with a wealth of experience and prior learning (Knowles, 1980). Adults need to be motivated and self-directed and learning needs to be relevant and goal oriented (Knowles). For learning to be effective, adults need to be engaged and learning needs to be individualized (Brookfield, 1991; Knowles). Case (1996) summarizes these principles with the acronym AIR - Active involvement, Individual differences, and Relevance and motivation.

Adults bring prior learning from their personal, family, work, and formal academic lives. It helps to establish what adult learners know before offering information and to connect new learning with previous learning (Knowles, 1980; Lieb, 1991). As well, adult learners may have fixed opinions and ideas (Knowles). Teachers and facilitators need to be prepared with the skills and patience that is required to challenge strongly held beliefs when offering new ideas.

Adults are self-directed and this means they are actively involved in the learning situation (Knowles, 1980). As learners, adults choose to learn something and are capable of planning their learning. As facilitators of learning, teachers do not simply supply facts

to dependent learners but help independent adults learn new information and skills. The teacher brings an expertise and respects that all adult learners are experts in their own respect, especially with their own lives.

Adult learners are ready to learn when topics are meaningful to them (Knowles, 1980; Lieb, 1991). As well, timing is important and the teachable moment is sometimes difficult to capture (Knowles; London, 1999). Theories and concepts need practical applications so that the learners see the relevance to their own situations. It is important to understand that adults are goal oriented and have a problem-centered or performance-centered focus to learning (Knowles, 1980). It is best to be organized and provide information in short, logical segments (Draves, 1997; Knowles; Lieb, 1991).

The literature searches provided a rationale for doing the study, and tools to complete it. The five areas covered in this chapter, factors that affect breastfeeding duration; maternal breastfeeding self-efficacy/confidence; prenatal/antenatal breastfeeding education; self-efficacy theory; and adult learning principles were integral to proposing the thesis, developing the workshop, designing the randomized controlled trial, and analyzing the data.

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Abstract

This article describes a prenatal breastfeeding workshop developed for primiparous women. Maternal breastfeeding self-efficacy, defined as a woman's confidence in her ability to breastfeed, is positively related to breastfeeding success. Strategies, based on Bandura's Self-Efficacy Theory and adult learning principles, are incorporated in the workshop curriculum. The purpose is to increase a woman's breastfeeding self-efficacy in the early postpartum period.

Keywords: adult education--adult learning principles--antenatal education--breastfeeding--confidence--prenatal education--self-efficacy--social cognitive theory

Callouts

1. Maternal breastfeeding self-efficacy is the confidence a woman has in her ability to breastfeed (Dennis).
2. Performance accomplishment, vicarious learning, verbal persuasion, and a positive emotional/physiological state contribute to self-efficacy (Bandura).
3. The higher our self-efficacy, the more likely we will exert effort and sustain persistence in an effort to succeed (Bandura).

A woman, expecting her first baby, intends to breastfeed. What are the essential elements that will contribute to this new mother effectively establishing breastfeeding? How can nurses and lactation consultants support women who choose to breastfeed? What type of support can be offered in the prenatal period? One strategy is prenatal education. This article describes a prenatal breastfeeding workshop designed to help primiparous women build a sense of breastfeeding self-efficacy.

Background

Exclusive breastfeeding is recommended for the first six months of life and continued breastfeeding with complementary foods is recommended for the first two years and beyond (Health Canada, 2004; Kramer & Kakuma, 2002; World Health Organization [WHO], 2002). Early weaning is defined as stopping breastfeeding before the infant is twelve weeks of age (Health Canada, 1999; Maclean, 1998). National statistics show that early weaning and less than optimal duration persist, with about one third of the women who initiate breastfeeding weaning before eight weeks postpartum and only about one fifth of the women exclusively breastfeeding at six months (Health Canada, 1999; Millar and Maclean, 2005; Statistics Canada, 2003).

This prenatal breastfeeding workshop was based on a pilot study that was completed in 2002 (Bassett, Dumas, & Mayrand-Leclerc, 2002). In the original pilot study, a convenience sample of sixteen families was recruited through the

offices of midwives, family doctors, and obstetricians. Eight families formed the experimental group and eight families formed the comparison group. The experimental group attended a prenatal education session.

The original pilot study was based on an identified problem of early weaning. The research question was, "Does a prenatal intervention, designed specifically to incorporate elements that contribute to self-efficacy in breastfeeding, help to build a woman's breastfeeding confidence and ultimately affect breastfeeding outcomes?" (Bassett et al.). The results of the original pilot recommended replication with a larger sample and further study of breastfeeding confidence and its relationship to breastfeeding duration (Bassett et al.).

Maternal Breastfeeding Self-Efficacy

Maternal breastfeeding self-efficacy is defined as the confidence a woman has in her ability to breastfeed (Dennis, 1999). Maternal breastfeeding confidence and breastfeeding self-efficacy have been identified as positively related to breastfeeding duration (Blyth et al., 2002; Blyth, et al., 2004; Chezem, Friesen, & Boettcher, 2003; Dunn, 2003; O'Campo, Faden, Gielen, & Wang, 1992). In other words, the more confidence or breastfeeding self-efficacy a woman has, the more likely she will continue breastfeeding. Therefore, a prenatal breastfeeding workshop was designed with the purpose of increasing a woman's confidence in her ability to breastfeed.

Self-efficacy is a key concept in Bandura's Social Cognitive Theory

(1997) and can be used as a framework for predicting health behaviour and for initiating health promoting activities (Bandura, 1998; Maibach & Murphy, 1995). According to Bandura (1986), self-efficacy is the belief we hold in our ability to accomplish a task. Bandura's theory maintains that self-efficacy influences the choices we make and how we feel about facing a challenge. The higher our self-efficacy, the more likely we will exert effort and persevere to succeed. Bandura (1977, 1994) proposes that there are four sources or modes that influence self-efficacy: performance accomplishment, vicarious learning, social/verbal persuasion, and emotional/physiological arousal.

These four influential sources of self-efficacy may be applied to establishing a successful breastfeeding experience. *Performance accomplishment*, or role mastery, would mean that as a woman is successful with the act of breastfeeding, she then builds her confidence in her ability to breastfeed (Bandura; Dennis, 1999). *Vicarious experience*, or learning by seeing others accomplish a task, requires that a woman sees breastfeeding modeled by other mothers (Bandura; Dennis). *Social or verbal persuasion* from a credible source can help increase a woman's confidence in her ability to breastfeed (Bandura; Dennis). *Emotional/physiological arousal* is addressed by reducing anxiety and correcting any possible faulty beliefs (Bandura, personal communication, May 6, 2004). Being overtired, in pain, or emotionally stressed may decrease maternal breastfeeding self-efficacy because women interpret these states as proof they are

less capable of breastfeeding (Dennis).

The Prenatal Breastfeeding Workshop

We planned a two and one half hour prenatal breastfeeding workshop for primiparous women in their last trimester. Enrollment in each session was limited to eight women plus their partners. We used a large executive boardroom at the hospital that had a conference table, adjustable armchairs, and multimedia equipment including a computer, LCD projector, and TV with VCR. We provided life-like dolls (see Figure 1), handouts, blankets, and a telephone book for foot support. The participants were asked to bring a pillow and many brought nursing pillows. Partners were welcome and the option of the partner attending was left to each family.

The workshop included five basic topics: 1) preparation for breastfeeding, 2) baby's cues for starting and stopping a feeding, 3) positioning for both the mother and baby, 4) indications that breastfeeding is effective, and 5) tips for coping. These topics are relevant to all first-time mothers and cover the basics of an uncomplicated breastfeeding relationship. Suggestions for overcoming difficulties were not included in the curriculum but were addressed either from the point of view of prevention or in response to a question from a participant. For example, low milk supply was not a topic; however, ensuring an adequate milk supply was included in discussions of using the baby's cues to start and stop breastfeeding.

We designed the workshop with a short introductory questionnaire, a PowerPoint® presentation, a hands-on segment with life-like dolls, two videos, and a brief post-class evaluation. The workshop started with participants picking up a doll, a pen, and the introductory questionnaire.

This questionnaire, with space for participants' notes, had three questions: *What have you heard about breastfeeding? What do you want to know about breastfeeding?* and *Questions that have come up during this workshop?* As participants arrived, there was time to complete the first two questions. These two questions were intended as a needs assessment and we either asked for their answers and concerns at the beginning of the session or checked during the workshop to ensure needs were being met. The third question helped participants remember their concerns and, if still unanswered, they were dealt with at the end of the session.

The PowerPoint® presentation (see Table 1) had specific slides to help us to stay on track, to initiate or guide discussions, to highlight principles, to prompt using the video, and to introduce the hands-on segment. Ten of the slides were pictures of mothers and babies. We debated using PowerPoint®. When used unwisely, this tool takes the focus off the learner and creates a didactic, lecture format to a workshop. Several authors offer recommendations for the judicious use of PowerPoint® (Holzl, 1997; Kaminski, 2003; Parkinson and Hollamby, 2003). In the end, we decided to use PowerPoint® slides but not to be restricted

by them. The PowerPoint® presentation was used as needed. In some workshops, the slides were used to initiate discussion, while in other workshops the same slides might have been used to summarize or highlight the topic.

Applying Bandura's Self-Efficacy Theory to the Workshop

Bandura's theory of self-efficacy was the first consideration when planning the prenatal breastfeeding workshop. Specifically, we incorporated role mastery, vicarious learning, verbal persuasion, and the emotional/physiological mode into the workshop (see Table 2).

Role Mastery and the Hands-On Segment

Role mastery is the most influential principle in self-efficacy theory and repeated successes will raise self-efficacy beliefs (Bandura, 1977; 1986; 1994). To provide a simulated breastfeeding experience for pregnant primiparous women, we designed a hands-on segment with life-like dolls (see Figure 1). The dolls were 20 inches, had realistic faces, and had been altered to weigh about four and a half pounds. Their weighted heads fell back easily and they felt like a seven or eight pound baby. There was a doll for each participant.

We designed the workshop to allow time with every participant to try each of the four most common breastfeeding positions and to discuss her preferences including her concerns about positioning and needs for comfort. We used the telephone book for a footrest and blankets for shoulder and lumbar support as needed. During this time, the principles of good positioning were reinforced.

Some of the women had problems with carpal tunnel or Blackberry syndrome and there were differences in body shape and size, so optimal positioning varied. Partners were encouraged to participate and their role was discussed.

Vicarious Learning and the Videos and Pictures

Videos and pictures provided participants with opportunities for vicarious learning. We used two videos for the workshop. The first, a ten minute video called *Infant Cues: A Feeding Guide*, was played at the start of the workshop (Texas Department of Health, 1998). This video shows several mothers and their newborn infants and, with only music as a background, it illustrates cues to start feeding, positioning, waiting for a wide gaping mouth, nursing the baby, cues to stop, and signs of satisfaction.

The second, a thirty minute video called *Breastfeeding: How to*, was used throughout the workshop (McElaney & Humenuk, 1998). This video features parents discussing their experiences with breastfeeding. It is presented in segments, making it easy to start and stop the video. As the participants saw other parents being successful, we expected to build their confidence to succeed.

Verbal Persuasion and the Discussions

Bandura (1986; 1994) identifies social persuasion, specifically verbal persuasion, as a means to increase self-efficacy beliefs with the qualifier that it is easier to verbally undermine, not build, self-efficacy. Positive, appropriate encouragement from a credible source may have a positive effect. Exaggerated or

inappropriate praise may undermine self-efficacy and discredit the persuader (Bandura, 1986).

Verbal persuasion was provided by the workshop facilitator. Workshops were facilitated by a registered nurse with the International Board of Lactation Consultant Examiners certification who has specialized in providing maternity care and breastfeeding support. The facilitator was skilled with leading group discussions and providing individual counselling.

During discussions and while answering questions, the facilitator offered options to participants. For example, the facilitator prefaced suggestions with statements such as, "Some women do..." or "Some families find it works to..." and this engaged participants to choose what would work for them (Mohrbacher & Stock, 2003). Offering options, as this facilitator did, is quite different from giving advice which may begin with "You should..." or "You ought to..." (Mohrbacher & Stock). When giving advice, a decision has been made by the advice-giver and only one option is given to the person.

Using empowering language was also considered important (Noel-Weiss, 2000). As pointed out earlier, verbally it is much easier to weaken than to strengthen self-efficacy. For instance, the facilitator was careful with the use of the words *when* and *if* and used *if* for a possible negative outcome, and *when* for a positive outcome. As an example, stating, "*When* you have sore nipples" sounds very different from stating, "*If* you have sore nipples". Also, "*If* the baby latches"

has a different message from the statement, "*When* the baby latches".

The Emotional/Physiological Mode and the Early Postpartum Period

Bandura (1986, 1994) suggests that people interpret fatigue, fear, and pain as signs of their lack of ability to accomplish a task. Steps were taken in the prenatal breastfeeding workshop to reduce stress and make participants feel physically comfortable. We offered evening or daytime workshops to accommodate personal preferences, supplied comfortable chairs with adequate support, and provided opportunities for breaks and moving around.

Considerations for this mode were also carried into discussions of coping in the postpartum period. Planning for adequate rest, preparing appropriate nutrition, and managing the needs of a recovering mom and her new baby were discussed. The early postpartum days were compared to moving and getting a new job at the same time. The probability of fatigue, stress, and confusion and the need to allow time for healing, recovering, and adjusting to new roles were discussed.

Applying Adult Learning Principles to the Workshop

Adult education theory takes into account that adults come to a learning situation with prior knowledge and life experience (Brookfield, 1991; Case, 1996; Knowles, 1980). Adults need to be motivated and self directed and learning needs to be relevant and goal oriented (Knowles). Adult learning principles were integrated into the prenatal breastfeeding workshop curriculum (see Table 3).

Adult Learners are Self-Directed

To say adults are self-directed means adults are actively involved in the learning situation (Knowles, 1980). As facilitators, we are not just supplying facts to dependent learners but helping independent adults learn new information and skills. Of course, this does not mean the facilitator abdicates responsibility for teaching (Brookfield, 1991). The facilitator brings an expertise in the field but respects that each adult learner is an expert in her own respect, especially with her own life and family.

At the beginning of the workshop there was a short questionnaire. Its purpose was to assess some of the participants' learning needs. What do they know? What do they want to know? Setting a tone of acceptance and openness was also important to encourage participation. Participants and partners introduced themselves and we used their names during the class. We asked that what was said in the workshop would remain confidential and we offered to discuss private questions at break or afterward.

We encouraged questions. Material that is covered when it is asked for by an adult learner will probably have more impact, be more relevant, and allow the adult learner to move on and take in something else (London, 1999). To delay, or to not answer a question when it is asked, takes the focus off the adult learner's needs and puts the focus on the facilitator's agenda. When we did not know the answer or if it was outside of our scope of practice, we acknowledged the validity

of the question and admitted we could not answer it.

Adult Learners Have Prior Learning and Life Experience

Adults bring prior learning from their personal, family, work, and formal academic lives. Adults need to connect new learning with previous learning (Knowles, 1980; Lieb, 1991). It is important to establish what adult learners know before offering information. As well, adult learners may have fixed opinions and ideas (Knowles). It takes skill and patience to challenge strongly held beliefs when offering new ideas. In the end, the facilitator is responsible for the information given and not the decisions the participants make.

In the workshop, we stated in our introduction that some ideas might be new or surprising to the participants and that, if they were not comfortable asking questions in the group, we would be available to discuss their questions privately. We used open-ended questions to initiate discussions and we had follow up questions ready if needed to keep the discussion going.

We used analogies to build on previous learning. For example, using an analogy of how parenting and breastfeeding are new challenges, like other challenges they have faced, we asked, "What advice would you give to a woman who is about to start a new job, is planning a wedding or is about to graduate from school?" Answers from participants, such as, "it takes time to feel comfortable in the new job", "do what you want, not what everyone is telling you to do", and "you can never be prepared for it" were then applied to taking on the new

parenting role, to learning breastfeeding skills, and coping with other family members as changes happen.

To generate a discussion of infant feeding cues, we asked, "What are the signs that your partner wants to eat?" and "What are the signs your partner is full?" Answers such as "he asks", "he opens the fridge", "he is cranky", and "he slows down", "he puts his fork down", "he pushes away from the table" and "he naps on the couch" were then applied to what babies do to indicate they need to nurse or that they are finished.

Learning Needs to be Relevant

Adult learners want to learn about issues that are meaningful to them (Knowles, 1980; Lieb, 1991). As well, timing is important and the teachable moment is sometimes difficult to capture (Knowles; London, 1999). Theories and concepts need practical applications so that the learners see the relevance to their own situations.

We offered principles instead of rules to be followed. We gave the rationale for such things as women positioning with their knees higher than their hips and infants being positioned with their ear, shoulder, and hip in one line. During the hands-on positioning session, we pointed out aspects of positioning that may put stress on the mother's nipple or on her wrists or shoulders.

The timing of the breastfeeding prenatal workshop may have not have been optimal because many of the participants were anxious about and preparing

for their first birth experience. With the baby not actually present, many topics were discussed in the abstract and this may not be as effective as answering questions in the postpartum period when women are actually dealing with a breastfeeding baby.

Learning Needs to be Goal-Oriented

Adults tend to enter a learning situation with a problem-centered or performance-centered focus (Knowles, 1980). It is best to have clearly defined elements and be organized (Lieb, 1991). Information is best provided in short, logical segments (Knowles; Draves, 1997).

For the workshops, we developed a clear outline, provided an agenda, and used a variety of teaching methods. We tried to remain sensitive to the needs and personality of the group we were with at each workshop. For some classes, the videos and PowerPoint® were used to initiate the topics and discussion was secondary. In other classes, discussion flowed easily and topics came up naturally with participants' questions. Time was a factor and if the questions were off topic we would give a short answer and then get back on topic by offering a new question, the videos or the PowerPoint®.

In the end, at each workshop we tried to offer the five basic topics at least three times in a variety of ways: video, slide, discussion, answers to participant questions or with the hands-on session. Information was also offered in three single page handouts: La Leche League (2002) publication called *Breastfeeding*,

illustrations of breastfeeding positions, and a leaflet with signs that baby is doing well or that baby needs help and where to get breastfeeding help.

What Participants Had to Say After the Workshop

At the end of each prenatal breastfeeding workshop we asked the participants to complete an informal evaluation with two questions: *What has been helpful about this workshop? What would you change?* We had forty-two evaluations returned from the fifty women who attended the workshops.

Concerning the first question about what had been helpful, about three quarters cited positioning and the hands-on segment with several adding they liked the dolls and/or the one-to-one time. Almost half wrote in comments about finding the tips or information useful and about a fifth noted they liked the videos/slides. A dozen participants felt more confident or reassured and about ten wrote that having their questions answered was helpful. Smaller numbers of participants (three to five) mentioned topics such as small class size, take home handouts, and real life stories as helpful.

For the second question, the most common response, from more than half of the participants, was to leave the section blank or to write that nothing needed to be changed. The second most frequent comment, to make the workshop longer, came from several participants. A few said the change that they would make would be to bring their partner. All of this feedback was helpful and

294 continued use of written evaluations would be a valuable means of ensuring the
295 workshops remain relevant to the participants.

296 ## Future Strategies

297 A randomized controlled trial is currently underway with about one
298 hundred women. Half of the participants formed the intervention group and
299 attended the prenatal breastfeeding workshop. The remaining participants formed
300 the control group and received standard care. Breastfeeding duration and
301 maternal breastfeeding self-efficacy will be measured and the results may help
302 determine the effects of the prenatal breastfeeding workshop.

303 With the experience of this workshop, changes should be considered and
304 further research is recommended. Changes would include making the prenatal
305 breastfeeding workshop longer or creating a series of workshops. We wonder if a
306 series, beginning prenatally and finishing in the early postpartum period, would
307 allow time to assimilate and apply new learning.

308 As well, time with breastfeeding mothers and their babies could be
309 incorporated into the curriculum. From the point of view of vicarious learning,
310 we expect that a chance to see and speak with women who have established
311 breastfeeding would have advantages that videos and slides cannot provide.

312 The impact of class size on learning effectiveness requires further
313 research. Cost is also a consideration when designing these workshops. A larger
314 group could be more cost-effective but quality may be lost in the larger group.

Finally, a room designed for the workshops would be used. The executive boardroom we used was a very formal setting. A room with breastfeeding posters and homelike furniture, designated for the workshops, might set a better mood.

Nursing Implications

This curriculum may be useful to nurses and lactation consultants who are supporting women who want to breastfeed. The curriculum can be adapted to a variety of settings and for diverse populations. As well, prenatal educators should incorporate self-efficacy strategies into existing prenatal breastfeeding classes and workshops.

For healthcare providers who are designing prenatal breastfeeding workshops, we suggest some strategies for success. It takes practice to feel confident with facilitating workshops. If possible, watch others plan and teach or facilitate workshops. Feedback from parents attending workshops and from colleagues will be helpful. Practicing ahead of time or working with a partner may lessen both emotional and physical stress.

We have attempted to give enough information to design a workshop. We appreciate that, as adult learners, facilitators are self-directed and have their own style. They bring to a workshop prior learning and life experiences. We have not given the words to speak but, instead, the theory and principles to apply when designing a prenatal breastfeeding workshop.

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Table 1

PowerPoint® Presentation for Prenatal Breastfeeding Workshop

Type of Slide	Features/Details	Purpose
Titles and Text	Title of workshop Agenda Headings for topics: 1. Preparing for Breastfeeding 2. Hunger Cues/Signs of Satisfaction 3. Positioning for Mom and Baby 4. You Know Your Baby is Getting Enough When... 5. Tips for Coping	• helped ensure topics were covered • could be used to introduce a topic of discussion • could be used to highlight or reinforce discussion • helped to stay on topic or return to topic
Pictures	Ten pictures of mothers and babies cuddling and/or breastfeeding placed throughout presentation	• provided examples of mothers modeling breastfeeding • variety of positions shown • opportunity for discussion • pause for regrouping or changing topic
Prompts	To start introductions of participants To start the hands-on demonstration To prompt playing the video	• cue to start an activity or discussion • slides highlighted a positive approach to breastfeeding • used to bring discussion back to topic

Table 2

Strategies for Prenatal Workshop - Self-Efficacy Theory

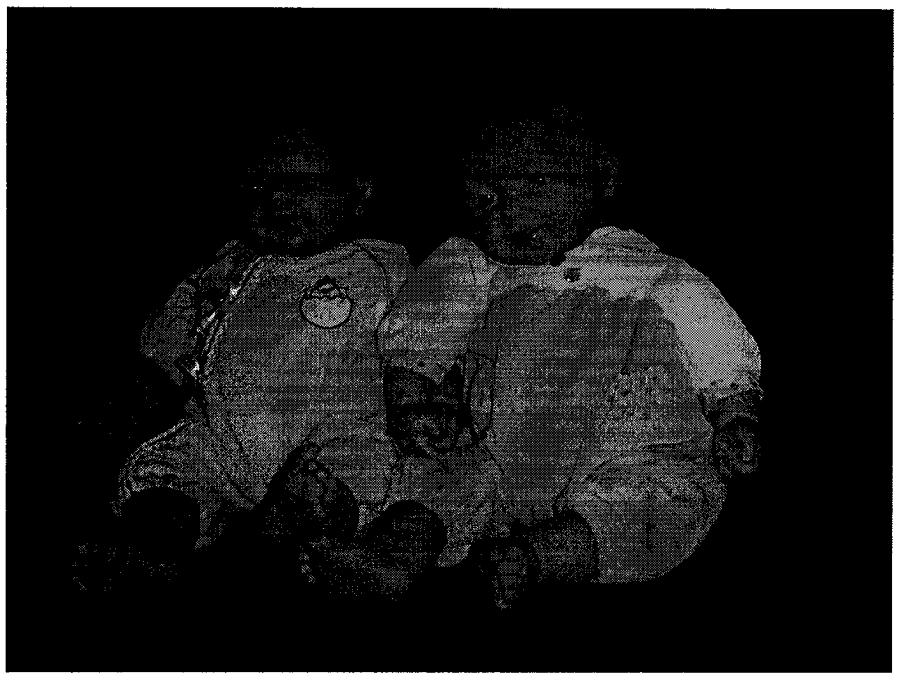
Principle	Objective	Action/Activity
Performance accomplishments	To simulate breastfeeding and give participants opportunities to perform task and develop mastery	• use life-like weighted dolls to practice positioning • encourage trying at least four positions - ie football/clutch, cradle, cross-cradle, and side lying • ensure comfort with armchairs, pillows, footrests (telephone book) • discuss what they might use and how they can be comfortable at home
Vicarious experience	To provide opportunities for learning from other mothers	• run video, Infant Cues, at beginning and at break time • use video, How To Can Do, with mothers and babies breastfeeding • use pictures in PowerPoint® presentation • use examples/anecdotes
Verbal persuasion	To establish credibility and trust To encourage participants' empowerment	• establish profession credibility • offer topics in short, logical sections • use empowering language • use generalizing to allow for differences - eg 'some find this, some find that' • offer options as opposed to advice
Emotional arousal	To reduce anxiety and correct any misconceptions To provide suggestions to decrease emotional stress and physical discomfort in the postpartum period	• create a relaxed, open environment in the workshop • make suggestions for caring for self eg getting enough sleep • propose ideas for dealing with baby care and baby's crying • offer tips for coping with housework and cooking • reinforce that each family is unique • use appropriate humour

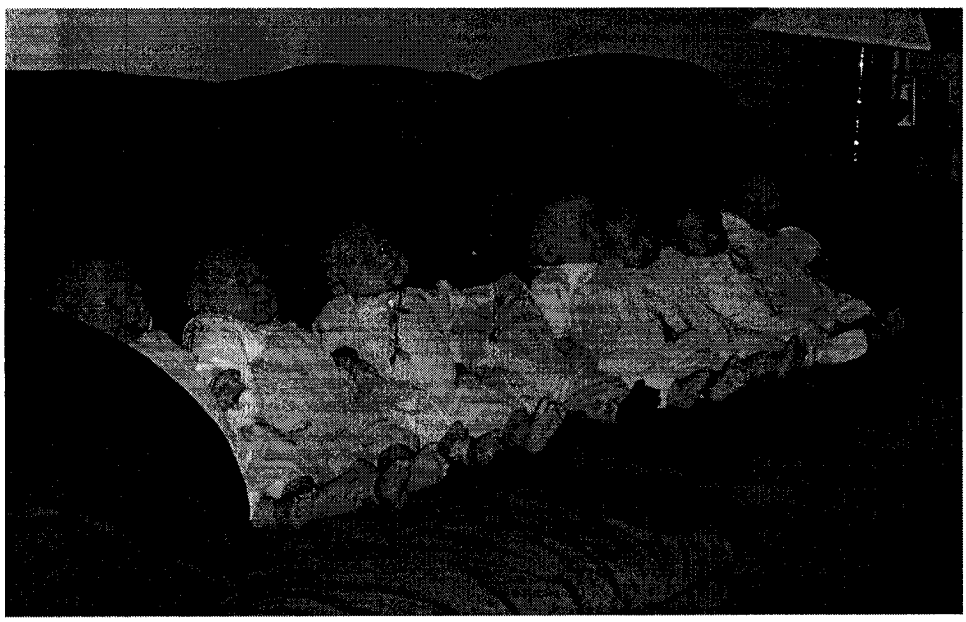
Table 3

Strategies for Prenatal Workshop - Adult Learning Principles

Principle	Objective	Action/Activity
Active Involvement	To promote participants' involvement	• participants list what they 'have heard about breastfeeding' and what they 'want to know about breastfeeding' before workshop begins • facilitate discussions with open-ended questions • use hands-on demonstrations • include time with each participant to try out positioning with dolls
Individual Differences	To respect individual differences and needs	• limit class to eight families • allow for time at break and afterward for one-to-one discussions • demonstrate acceptance and respect of differences between families • show appreciation that some information may be new or surprising • ask for confidentiality and that personal stories remain with group • use a variety of learning formats - written, visual, audio and appeal to cognitive, practical, and affective domains
Relevance and Motivation	To ensure the participants' concerns are covered	• cover initial questions about what they 'have heard about breastfeeding' and what they 'want to know about breastfeeding' • answer questions as asked • keep topics short • use short, specific sections to maintain interest • use analogies and examples

Figure 1 - Dolls used for prenatal breastfeeding workshop





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Objective: To determine the effects of a prenatal breastfeeding workshop on maternal breastfeeding self-efficacy and breastfeeding duration.

Design: A randomized controlled trial.

Setting: A large tertiary hospital in Ontario, Canada.

Participants: 110 primiparous women, expecting a single child and an uncomplicated birth, and planning to breastfeed.

Intervention: A 2½-hour prenatal breastfeeding workshop based on adult learning principles and self-efficacy theory.

Main Outcome Measurement: Maternal breastfeeding self-efficacy and numbers of days and amount of breastfeeding were measured at four and eight weeks postpartum.

Results/Data Analysis: Over time, maternal breastfeeding self-efficacy scores increased in both groups with the intervention group having higher scores. At week 4, there was a significant difference in scores (control, M = 53.38 (SD = 9.1); intervention, M = 57.98 (SD = 8.6), t(78) = -2.32, p = .023, *d* = .523, CI -8.53, -0.65). At week 8, there was a difference in scores but, given the small sample size, these were not statistically significant (control, M = 58.91 (SD = 9.1); intervention, M = 61.70 (SD = 5.8), t(72) = -1.60, p = .115, *d* = .412). There was little difference in the number of days of breastfeeding but the intervention group had more exclusive breastfeeding (70% vs. 58%) and less weaning (15% vs. 22%).

Conclusions: The workshop increased maternal breastfeeding self-efficacy and exclusive breastfeeding.

Keywords: breastfeeding--self-efficacy--confidence--prenatal education--antenatal education--adult learning principles

Callouts

1. Statistics tell us about 85% of Canadian women initiate breastfeeding and about one third have stopped by the eighth week postpartum.
2. Maternal breastfeeding self-efficacy scores increased, over time, in both groups with the intervention group having higher scores than the control group at both week 4 and week 8.
3. At week 8, the intervention group was more often exclusively breastfeeding than the control group.

Background

Clinical Issue

Breastfeeding has health benefits for mothers and infants that are well documented (Lawrence & Lawrence, 1999; Riordan, 2005). Canadian women, responding to the evidence and recommendations from professionals, are initiating breastfeeding in larger numbers than the past three generations but breastfeeding rates still drop precipitously in the early weeks (Health Canada, 1999; Maclean, 1998; McNally, Hendricks, & Horowitz, 1985; Millar & Maclean, 2005; Statistics Canada, 2003). The reasons, given by mothers for early weaning, including lack of milk, difficulties with technique, sore nipples and fatigue, indicate a need to address the issues that women face (Millar & Maclean, 2005; Sheehan, Krueger, Watt, Sword, & Bridle, 2001; Williams, Innis, Vogel, & Stephen, 1999).

Maternal breastfeeding self-efficacy is defined as the confidence a woman has in her ability to breastfeed her baby (Dennis, 1999). Maternal confidence and breastfeeding self-efficacy are recognized as modifiable factors that contribute to breastfeeding success (Blyth et al., 2004; O'Campo, Faden, Gielen, & Wang, 1992; Williams, et al., 1999).

The Hypotheses of this Randomized Controlled Trial

1. A prenatal breastfeeding workshop, based on the theory of self-efficacy and adult learning principles, would increase maternal breastfeeding self-efficacy in the early postpartum period.

2. Increased maternal breastfeeding self-efficacy would result in increased breastfeeding duration.

The Original Pilot Study

This randomized controlled trial was based on a pilot study completed by a nurse at a large tertiary care hospital (Bassett, Dumas, & Mayrand-Leclerc, 2002). In the original pilot study, a convenience sample of sixteen families was recruited through the offices of midwives, family doctors, and obstetricians. Eight families formed the experimental group and eight families formed the comparison group. The experimental group attended a prenatal education session.

Breastfeeding self-efficacy was measured at the end of the prenatal education session (intervention group only) and at 24 hours post-birth and four weeks postpartum (both groups) using the Breastfeeding Self-Efficacy Scale (Bassett et al; Dennis & Faux, 1999). The results of the pilot project suggested that the intervention may be effective in influencing certain aspects of breastfeeding self-efficacy. The authors of the original pilot study recommended replication with a larger sample and further study of breastfeeding confidence and its relationship to breastfeeding duration (Bassett et al).

Current Literature

A search of the literature indicated maternal breastfeeding confidence and maternal breastfeeding self-efficacy were elements that affect breastfeeding duration (Blyth et al., 2002; Cerandas et al., 2003; Dunn, 2003; O'Campo, Faden,

Gielen, & Wang, 1992). Self-efficacy theory proposes that the higher a woman's confidence, the more efficacious she feels about breastfeeding then the more likely she will be to continue breastfeeding (Bandura, 1977; Dennis, 1999).

Prenatal education contributes to increased breastfeeding duration (Cox & Turnbull, 1998; Kistin, Benton, Rao, & Sullivan, 1990; Pugin, Valdés, Labbok, Pérez, & Aravena, 1996). Programs with hands-on demonstrations positively affect duration more than programs based solely on cognitive learning (Duffy, Percival, & Kershaw, 1997; Hill, 1987; Pugin et al.). Appealing to the practical and affective domains of learning seems to be more important than having the education session led by professionals or peers (Sheehan, 1999).

Additional factors have been identified as affecting breastfeeding duration, including maternal age and education level, family income, family support, timing of decision to breastfeed and timing of first feeding (Cerandas et al., 2003; McLeod, Pullon, & Cookson, 2002; Sheehan et al., 2001; Williams et al., 1999). These factors needed to be understood to account for possible confounding factors when collecting and analyzing data for this study. They were incorporated into prenatal and four week postpartum demographic questionnaires.

Methods

Research Design

This study was designed as a randomized controlled trial. Participants registered prenatally and were then randomized into the intervention group or the

control group (see Figure 1). The control group received standard care and the intervention group received standard care and attended a two and half hour prenatal breastfeeding workshop (Noel-Weiss, Bassett, & Cragg, 2005). Specifics of standard care was determined by individual participants and their primary caregivers. An a priori power analysis determined that 200 participants were required to detect a 0.4 effect size with a power of 80%. Measurements were taken at baseline before randomization, after the workshop, and at four and eight weeks postpartum. Because of the type of intervention, participants could not be blinded to their randomized grouping.

Participants

Participants were primiparous women, expecting a single child and an uncomplicated birth, and planning to breastfeed. Participants had an expected date of confinement between August 2004 and February 2005 and gave birth at a large tertiary hospital. This hospital has two campuses and averages 600 to 700 births each month (Perinatal Partnership Program of Eastern and Southeastern Ontario, 2003). The women had to be able to read and write in English and required a telephone to complete the postpartum questionnaires. To remain in the study, a mother and her infant had to be discharged at the same time and had to be able to breastfeed without restriction. We applied for and received approval from both the university and hospital research ethics boards.

The study was advertised through a poster and pamphlet campaign. The

majority of participants registered at their doctor or midwife's office. Some were invited by their caregiver but most had called the study telephone line and arranged for a registration package to be left with the doctor or midwife. As well, research assistants registered participants at a parenting exposition and a community baby shower. Several women registered through prenatal classes.

One hundred and ten women volunteered for the study. The first nine participants formed a pilot group to trial the workshop. One hundred and one were randomized into the control or intervention group. Ten, one from the pilot group and nine from the randomized group, were lost to the study. Two participants chose to drop out for personal reasons, two we lost contact with, and six had medical reasons for not remaining in the study.

In the end, data analysis was completed with 92 randomized participants (control, n = 45; intervention, n = 47). When the 92 randomized participants were grouped by actual attendance at the workshop, 41 participants attended the workshop and 51 participants did not attend the workshop. Six women from the intervention group, who were scheduled for a workshop, did not attend it, either due to personal reasons or because the baby was born before the participant was able to attend.

The Intervention

The intervention was a two and a half hour prenatal breastfeeding workshop and it covered five basic topics: 1) preparation for breastfeeding,

2) baby's cues for starting and stopping a feeding, 3) positioning for both the mother and baby, 4) indications that breastfeeding is effective, and 5) tips for coping. For the primiparous women in this study, these are fundamental elements of an uncomplicated breastfeeding relationship.

The workshop curriculum was designed using Bandura's theory of self-efficacy and adult learning principles (Bandura, 1977; Knowles, 1980). According to Bandura, self-efficacy is the belief we hold in our ability to accomplish a task and he theorizes that the higher our self-efficacy, the more confident we are in our ability, the more likely we are to persist and to succeed.

Bandura (1977) proposed that there are four sources that influence self-efficacy: performance accomplishment, vicarious learning, social/verbal persuasion, and emotional/physiological arousal. These sources were incorporated into the workshop curriculum with the expectation of raising maternal breastfeeding self-efficacy (Noel-Weiss, Bassett, & Cragg, 2005).

Adult learning principles were also considered when designing and implementing the workshops. These principles take into account that adults tend to learn differently than children and adolescents (Knowles, 1980). Adults come to a learning situation with prior knowledge and life experience and they are inclined to be motivated and self directed. To be most effective, learning needs to be relevant and goal oriented.

Outcomes Measurement

Maternal breastfeeding self-efficacy was measured with the Breastfeeding Self-Efficacy Scale-Short Form [BSES-SF] (Dennis, 2003). The fourteen items on the Breastfeeding Self-Efficacy Scale are statements about coping, feeling capable, and managing breastfeeding. Each of the statements on the BSES-SF begins with, "I can always..." and is answered on a 5-point Likert scale with 1 = not at all confident; 2 = not very confident; 3 = sometimes confident; 4 = confident; 5 = very confident. These ratings were summed into a total score ranging from 14 to 70 with a higher total score indicating a higher level of maternal breastfeeding self-efficacy beliefs (Dennis, 2003; Polit & Beck, 2004).

The BSES-SF is a revision of the Breastfeeding Self-Efficacy Scale which had thirty-three items and this longer tool was used in the original pilot study (Dennis & Faux, 1999; Bassett, Dumas, & Mayrand-Leclerc, 2002). Items deemed redundant in the original tool were deleted resulting in the BSES-SF, a fourteen item, psychometrically tested tool (Cronbach's $\alpha = .94$) (Dennis, 2003). In this study, we found the tool to be internally consistent when used at registration, after the workshop, at four weeks postpartum, and at eight weeks postpartum (Cronbach's $\alpha = .91, .86, .86$, and $.87$, respectively).

Breastfeeding duration was measured at four weeks and eight weeks postpartum by first asking if the mother was breastfeeding and then by asking how much they were breastfeeding. We noted duration in number of days and by

category of infant feeding. Usually six categories of infant feeding are used for breastfeeding studies: *Exclusive breastfeeding*, *Almost exclusive*, *High*, *Partial*, *Token*, and *Bottle-feeding* (Labbok & Krasovec, 1990). With this classification, *Exclusive breastfeeding* means that the only fluid the infant receives is breastmilk (with/without vitamins) whether by breast or by bottle as expressed breastmilk.

For determining how the workshop affected a woman's confidence in her ability to breastfeed, it seemed important to differentiate actual feeding at breast from providing expressed breastmilk (EBM) by bottle. We recognize the effort and dedication required to pump and bottle-feed breastmilk. However, since a woman feeding her baby at breast cannot see and measure the amount of milk received, her confidence in her milk supply is tested in a way that is different from the mother who is pumping and bottle-feeding. Therefore, we considered *Exclusive breastfeeding* to be feeding only at breast and we added two additional infant feeding categories: *Exclusive by breast with some EBM* and *Exclusive EBM.*

Procedure

Randomization occurred after the women had completed the registration package that included a consent form, a contact information sheet, a prenatal demographic questionnaire, and the baseline Breastfeeding Self-Efficacy Scale - Short Form (BSES-SF). The registration package was returned to the researcher in a sealed manila envelope. The sealed manila envelope was matched with an opaque envelope containing a slip of paper that read either *control* or *class*. The

opaque envelopes had been sequentially numbered and were prepared by a statistician not associated with this study.

Women randomized into the intervention group were called and offered a choice of workshop times. The researcher called each participant after her expected date of confinement to confirm the baby's date of birth and the participant's eligibility to remain in the study. At four weeks, a research assistant, blinded to the mother's group assignment and workshop attendance, telephoned each mother and completed a postpartum demographic questionnaire, the BSES-SF, and a breastfeeding duration questionnaire. At eight weeks, the same research assistant telephoned each mother and completed a final BSES-SF and breastfeeding duration questionnaire.

We controlled two variables - prior infant feeding experience and the workshop facilitation. All participants were primiparous; therefore, they had not previously breastfed or bottle-fed a child of their own. All workshops were facilitated by the same person and this was intended to provide consistency. Other possible confounding variables, including maternal age, family income, type of birth experience, and perceived support were expected to be evenly distributed between the two groups through randomization.

Demographic information, collected at registration and at four weeks postpartum, was needed to account for possible confounding variables. Maternal breastfeeding self-efficacy, calculated using the BSES-SF, was measured at

registration to establish a baseline. It was also measured at four and eight weeks postpartum because this appears to be a critical time for early weaning (Health Canada, 1999; Kronberg & Vaeth, 2004; ; Millar & Maclean, 2005; Potter, 2003; Statistics Canada, 2003).

Data Analysis

The primary researcher and a research assistant coded the data and each built an SPSS 12.0.1 database with the data from the randomized groups. This allowed comparisons to ensure accuracy with data entry. The groups were compared with a t-test or a Pearson χ^2 test, depending on whether the variable was continuous or categorical. All t-tests were two-tailed. Alpha was set at .05.

Intention to Treat Analysis

Intention to treat (ITT) is a principle that assumes that participants received the intervention they were assigned to receive (Polit & Beck, 2004). In other words, participants remain in their randomized group, regardless of attendance in the workshop, for purposes of data analysis.

In this study, six women randomized to the intervention group did not actually attend the workshop. This left us with a dilemma. Intuitively, we reasoned that we should be comparing women who attended the workshop with women who did not attend the workshop. But, because this is a randomized controlled trial, intention to treat is the standard used to analyze data and this meant keeping the six non-attenders with the intervention group.

In the end, we chose to analyze using both intention to treat (ITT) and actual workshop attendance and to present the results side by side so differences between the two methods of analysis could be compared. The six participants from the intervention group were then moved to the non-attender group for analysis based on actual workshop attendance. When actual workshop attenders are compared with non-attenders there were variations from the intention to treat results. From the point of view of a randomized controlled trial and its statistical significance, using groups based on actual workshop attendance may not provide strong evidence but it does appear to have clinical importance.

Demographic Data

Demographic data such as age, marital status, and family income were collected prenatally, at registration. Information about birth experience was gathered at four weeks postpartum. Descriptive statistics, including means and proportions, were used to present the demographic data (see Table 1).

Results

There were no statistically significant differences between the two groups in either the registration and the four week postpartum demographics, $p \geq .05$ with all variables. This suggests that randomization was effective and that the groups did not differ, on average, on any potentially confounding variables.

Maternal Breastfeeding Self-Efficacy

Breastfeeding Self-Efficacy Scale scores from registration, four weeks and

eight weeks postpartum were compared using a t-test (see Table 2). The Breastfeeding Self-Efficacy Scale score was treated as continuous even though it is, technically, an ordinal variable. At registration, baseline scores were not statistically different (based on intention to treat (ITT), $t(84) = -.345$, $p = .731$).

At week 4, based on ITT, the BSES-SF scores showed that the control group had a mean of 53.38 (SD = 9.1) while the intervention group had a mean of 57.98 (SD = 8.6) with an effect size, $d = .523$. This was a statistically significant difference, $t(78) = -2.32$, $p = .023$. An analysis based on actual workshop attendance showed similar results. The non-attender group had a mean of 52.90 (SD = 9.2) while the attender group had a mean of 58.72 (SD = 8.0), which was a statistically significant difference, $t(78) = -3.002$, $p = .004$, $d = .677$.

At week 8, based on ITT, the control group had a mean BSES-SF score of 58.91 (SD = 9.1) while the intervention group had a mean score of 61.70 (SD = 5.8), and this was not a significant difference, $t(72) = -1.60$, $p = .115$, $d = .412$. Based on actual workshop attendance, the non-attender group had a mean of 58.71 (SD = 9.1) while the attender group had a mean of 61.95 (SD = 5.6), $t(72) = -1.864$, $p = .066$, $d = .432$.

Both the intervention and control groups increased in their breastfeeding self-efficacy scores over time with the intervention group slightly higher than the control group (see Figure 2). At week 4, the difference was statistically significant and at week 8 the difference was not significant. The

intervention/attender group at week 8 had a much smaller standard deviation indicating these groups are, on the whole, becoming more similar in their scores. These results do not include scores of participants who had weaned because we did not ask the BSES-SF if the woman was not breastfeeding.

We also compared the groups with respect to each of the fourteen statements on the Breastfeeding Self-Efficacy Scale-Short Form (BSES-SF). Many of the statements were significantly different at either four or eight weeks, but only one statement, "I can always determine that my baby is getting enough milk", was statistically significant for both the intervention/control and the attender/non-attender groups at both week 4 and week 8.

At week 4, the intervention/attender group had a higher self-efficacy score for this statement (intervention, $M = 4.17$, $SD = 0.9$, control, $M = 3.53$, $SD = 1.2$ and attender, $M = 4.28$, $SD = 0.9$, non-attender group, $M = 3.45$, $SD = 1.2$) and this was statistically significant (ITT, $t(79) = -2.85$, $p = .005$ and actual workshop attendance, $t(79) = -3.796$, $p = .000$). At week 8, self-efficacy scores for this statement were also significantly different (intervention, $M = 4.58$, $SD = 0.7$, control, $M = 4.03$, $SD = 0.9$, $t(73) = -3.09$, $p = .003$ and attender, $M = 4.59$, $SD = 0.7$, non-attender, $M = 4.03$, $SD = 0.9$, $t(73) = -3.190$, $p = .002$). The multiple testing done increases the type I error rate and the results should be interpreted cautiously in light of this.

Breastfeeding Duration and Infant Feeding Practices

Breastfeeding duration was measured in days. At week 4, there was no difference between the control and the intervention groups regarding the numbers of days of breastfeeding. Using ITT, the control group had a mean of 26.24 days (SD = 5.8) and the intervention group had a mean of 26.32 days (SD = 5.1), t(90) = -.066, p = .948. Based on actual workshop attendance, the non-attender group had a mean of 25.45 days (SD = 6.5) and the attender group had a mean of 27.32 days (SD = 3.4), t(90) = -1.654, p = .102.

At week 8, this trend continued when duration (in days) was analyzed with ITT (see Table 3). There was no difference between the control group (M = 49.9, SD = 14.5) and the intervention group (M = 50.4, SD = 14.2), t(90) = .041, p = .875. There was a difference at week 8 when the analysis was based on actual workshop attendance, as the non-attender group had a mean of 47.1 (SD = 16.7) and the attender group had a mean of 54.0 (SD = 9.3), t(90) = -2.36, p = .020.

There appeared to be no correlation between baseline BSES-SF scores and the number of days of breastfeeding at eight weeks (r(86) = -.051, p = .639). The week 4 BSES-SF scores were moderately, positively correlated to numbers of days of breastfeeding at eight weeks postpartum (r(80) = .362, p = .001). An odds ratio was completed for both the ITT group and the actual class attendance group to determine the probability of the intervention/attender group exclusively breastfeeding at week eight. Results were inconclusive based on ITT (OR 1.7,

95% CI .728-4.07). Whereas, the attender group was three times more likely to be exclusively breastfeeding at eight weeks than the non-attender group (OR 3.2, 95% CI 1.26-7.94).

Infant feeding categories were also recorded to clarify the amount of actual breastfeeding (Table 3). These statistics are considered unstable because the sample size was small and there were fewer than 5 participants in several of the categories. We chose not to collapse the categories because of the descriptive statistics reflected in these categories.

Results for week 8, based on ITT, showed that the two groups varied in the amount and method of infant feeding each was doing. The intervention group (70% exclusively breastfeeding by breast, 15% other categories of breastfeeding and 15% weaned) had a higher rate of exclusive breastfeeding and a lower rate of weaning than the control group (58% exclusively breastfeeding by breast, 20% other categories of breastfeeding and 22% weaned), χ^2 (5, n = 92) = 8.41, p = .135.

The difference is quite striking when the groups were compared based on actual class attendance. The non-attender group (53% exclusively breastfeeding by breast, 18% other categories of breastfeeding and 29% weaned) had fewer participants exclusively breastfeeding by breast and more had weaned than the attender group (78% exclusively breastfeeding by breast, 17% other categories of breastfeeding and 5% weaned), χ^2 (5, n = 92) = 16.6, p = .005.

There were several participants who had been scheduled for the workshop

but missed it. A few had given birth and others missed the class despite rescheduling a second time. All of the participants who missed more than one scheduled workshop had weaned before the study was completed.

Data about the timing of the first feeding and the amount of formula used in the hospital were collected as part of the demographic information at week 4 (see table 3). These items are usually treated as independent, possibly confounding, variables that can affect breastfeeding duration (Hörnell, Hofvander, & Kylberg, 2001; Lawson & Tulloch, 1995). In this study, because the workshop preceded the baby's birth, it appears the workshop affected these variables. Simply put, we were not looking at how formula supplements and timing of the first feed affected duration but rather how attendance at the workshop affected formula supplementing and timing of the first feeding.

There were no statistically significant differences, between the control and intervention groups, in the time for the first feeding to occur and the amount of formula used but the effect size for the difference in timing of the first feeding was .342 ($p = .106$) and the effect size for the amount of formula was .226 ($p = .283$). The magnitudes of these effect sizes suggest that it would be worth studying these differences in another trial.

Discussion

The workshop seems to have had a positive effect on maternal breastfeeding self-efficacy and on the amount of breastfeeding mothers were

335 doing. We hypothesized that the prenatal breastfeeding workshop would increase
336 maternal breastfeeding self-efficacy and we further hypothesized that an increase
337 in self-efficacy would increase breastfeeding duration. Maternal breastfeeding
338 self-efficacy scores increased and this appears to be a result of the workshop,
339 especially at four weeks. As well, it appears the workshop had an effect on the
340 amount the mothers breastfed. Specifically, they were more confident about milk
341 supply and were more often exclusively breastfeeding. Unfortunately, without a
342 BSES-SF measurement for women who had weaned, we could not determine a
343 relationship between self-efficacy and breastfeeding duration.
344 Perceptions of insufficient milk are a major contributing factor to early
345 weaning (Health Canada, 1999; Maclean, 1999; Millar & Maclean, 2005;
346 Sheehan et al., 2001). Consistent with the national statistics, participants in the
347 study who had weaned were asked their reason for weaning and one third cited
348 lack of milk as the sole reason or as one of a combination of reasons. The results
349 with the statement about adequate milk supply suggest that the women who
350 attended the workshop and continued to breastfeed were more confident about
351 their milk supply.
352 It is interesting to note that the participants who missed more than one
353 scheduled workshop had weaned by the end of the study. Of course, the issues
354 causing a woman to miss a workshop, including lack of interest in breastfeeding
355 or a chaotic homelife, could also be factors contributing to early weaning.

Limitations

The main limitation is that we did not measure breastfeeding self-efficacy if the woman had stopped breastfeeding. We can not draw conclusions or determine a relationship between self-efficacy and duration without a score from the women who weaned.

The sample size was too small for some of the statistical analyses to have enough power. A larger sample size would have ensured larger numbers in the categories of infant feeding and may have helped determine the effect of the workshop on timing of first feeding and on amount of formula supplementation in hospital.

Participation bias limits the study results because the participants were self-selecting. Overall, both the control and intervention groups had higher breastfeeding rates at eight weeks postpartum when compared with national statistics. This indicates all participants may have started out more committed to, or more confident about breastfeeding than the general population. Although this does not affect internal validity, it does limit generalizability to other populations.

There were variations in the prenatal breastfeeding workshops. These variations can be attributed to the differing needs of each group and the workshop size, which varied from two to eight women plus their partners. The small group size can be attributed to sporadic registration and randomization, which sometimes clustered registrants into the control group leaving fewer participants

needing to take a workshop. We are uncertain if the smaller group size was an advantage or disadvantage in meeting the needs of the group and raising maternal breastfeeding self-efficacy.

Nursing Implications

We recommend that nurses and lactation consultants use a prenatal breastfeeding workshop based on self-efficacy theory and adult learning principles to help prepare and support women who want to breastfeed. This workshop is a valuable tool for increasing maternal breastfeeding self-efficacy and exclusive breastfeeding rates.

Further research to determine optimal workshop size and key elements that affect maternal breastfeeding self-efficacy is recommended. As well, establishing the ideal timing and length of the workshop would be useful. For example, workshops may be more effective if they were held in the first or second trimester, repeated during the prenatal period, or were longer than 2.5 hours.

Perhaps the best program would integrate the prenatal breastfeeding workshop into a comprehensive perinatal breastfeeding support program that would include postpartum professional care and peer support. Both the professional care and peer support could be built on a framework of self-efficacy theory and adult learning principles.

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Table 1

Comparison of Groups by Demographics for the Intention to Treat and Actual Workshop Attendance

Characteristic	Range	Intention to Treat Analyses					Actual Workshop Attendance Analyses				
		Control n = 45 (49%)	Intervention n = 47 (51%)	Test Statistic	p	Effect Size[a]	Non-attend n = 51 (55%)	Attend n = 41 (45%)	Test Statistic	p	Effect Size
Maternal age (years [0][b]	17-42	30.56 (5.2) n = 45	29.85 (4.0) n = 47	t = 0.733	.465	.154	30.53 (5.1) n = 51	29.78 (3.9) n = 41	t = 0.776	.440	.161
Marital status [0]				χ^2 = 0.001	.975	.003			χ^2 = 1.644	.200	.134
married/common law		44 (98%)[c]	46 (98%)				49 (96%)	41 (100%)			
other		1 (2%)	1 (2%)				2 (4%)	0			
Maternal education level [0]				χ^2 = 0.573	.751	.079			χ^2 = 3.200	.202	.187
high school or less		2 (4%)	1 (2%)				3 (6%)	0			
some post-secondary		11 (24%)	10 (21%)				13 (25%)	8 (20%)			
completed post-secondary		32 (72%)	36 (77%)				35 (69%)	33 (80%)			
Annual family income level [4]				χ^2 = 3.365	.339	.196			χ^2 = 2.992	.393	.184
< $17,000		0	2 (4%)				1 (2%)	1 (2.5%)			
17,000 - 31,999		5 (11%)	2 (4%)				6 (12%)	1 (2.5%)			
32,000 - 69,999		8 (19%)	9 (20%)				9 (19%)	8 (20%)			
> $70, 000		30 (70%)	32 (72%)				32 (67%)	30 (75%)			
When decided to breastfeed [2]				χ^2 = 0.385	.535	.065			χ^2 = 1.082	.298	.110
before getting pregnant		40 (89%)	38 (84%)				45 (90%)	40 (85%)			
after getting pregnant		5 (11%)	7 (16%)				5 (10%)	7 (15%)			
Prenatal goal for breastfeeding (in months) [c][8]	3-18	8.71 (3.22) n = 41	8.33 (3.15) n = 43	t = 0.550	.584	.119	8.73 (3.20) n = 45	8.26 (3.15) n = 39	t = 0.686	.495	.203
Own mother breastfed [5]				χ^2 = 3.921	.141	.045			χ^2 = 4.426	.109	.223
yes		22 (52%)	29 (65%)				25 (53%)	26 (65%)			
no		20 (48%)	14 (31%)				22 (47%)	12 (30%)			
unsure		0	2 (4%)				0	2 (5%)			
Attended prenatal [0]				χ^2 = 2.044	.153	.149			χ^2 = 0.236	.627	.051
yes		34 (76%)	29 (62%)				36 (71%)	27 (66%)			
no		11 (24%)	18 (38%)				15 (29%)	14 (34%)			

(continued)

Comparison of Groups by Demographics for the Intention to Treat and Actual Workshop Attendance (Table 1 con.)

Characteristic	Range	Intention to Treat Analyses					Actual Workshop Attendance Analyses				
		Control n = 45 (49%)	Intervention n = 47 (51%)	Test Statistic	p	Effect Size[a]	Non-attend n = 51 (55%)	Attend n = 41 (45%)	Test Statistic	p	Effect Size
Friend/family who breastfed [4]				$\chi^2 = 4.918$	.178	.236			$\chi^2 = 4.751$	.191	.232
no		1 (2%)	0 (0%)				1 (2%)	0 (0%)			
1 - 4		12 (28%)	20 (44%)				13 (27%)	19 (47.5%)			
>5		29 (68%)	22 (49%)				32 (67%)	19 (47.5%)			
unsure		1 (2%)	3 (7%)				2 (4%)	2 (5%)			
Partner's opinion [1]				$\chi^2 = 2.237$	.525	.157			$\chi^2 = 1.656$	.647	.135
no opinion		1 (2%)	0 (0%)				1 (2%)	0 (0%)			
supportive		3 (7%)	2 (4%)				3 (6%)	2 (5%)			
very supportive		41 (91%)	43 (94%)				46 (90%)	38 (95%)			
not applicable		0 (0%)	1 (2%)				1 (2%)	0 (0%)			
Ever had breast surgery [2]				$\chi^2 = 0.623$	.430	.083			$\chi^2 = 0.080$	.777	.030
yes		2 (5%)	4 (9%)				3 (6%)	3 (8%)			
no		42 (95%)	42 (91%)				47 (94%)	37 (92%)			
Type of care [0]				$\chi^2 = 0.046$	.977	.001			$\chi^2 = 0.568$	.753	.079
family physician		6 (13%)	7 (15%)				6 (12%)	7 (17%)			
midwife		1 (2%)	1 (2%)				1 (2%)	1 (2%)			
obstetrician		38 (85%)	39 (83%)				44 (86%)	33 (81%)			
Type of birth [0]				$\chi^2 = 0.004$	.951	.007			$\chi^2 = 0.557$	.445	.078
caesarean		16 (35%)	17 (36%)				20 (39%)	13 (32%)			
vaginal		29 (65%)	30 (64%)				31 (61%)	28 (68%)			
Gestational age (weeks) [0]	36-42	39.67 (1.49) n = 45	39.87 (1.12) n = 47	t = -0.751	.455	.116	39.59 (1.47) n = 51	40.00 (1.05) n = 41	t = -1.509	.135	.241
Birthweight (grams) [0]	2183-5046	3385 (554) n = 45	3488 (443) n = 47	t = -0.982	.329	.205	3393 (541) n = 51	3494 (446) n = 41	t = -.958	.341	.197
Free formula received [2]				$\chi^2 = 0.138$	.711	.039			$\chi^2 = 0.163$	.687	.043
yes		29 (66%)	32 (70%)				33 (66%)	28 (70%)			
no		15 (34%)	14 (30%)				17 (34%)	12 (30%)			

Notes. [a] The effect sizes are Cohen's *d* for the continuous variables and the Cramér's ϕ coefficient for the categorical variables (see Howell, 2002, pp. 205 and 165, respectively). [b] The number in brackets indicates the number of cases missing. [c] Seven participants reported that they wanted to breastfeed "as long as possible"; they were excluded from this analysis.

Table 2

Breastfeeding Self-Efficacy Scores by Intention to Treat and Actual Workshop Attendance Analyses

Timing of Score	Range	Intention to Treat Analyses						Actual Workshop Attendance Analyses					
		Control	Intervention	Test Statistic	p	Effect Size[b]	95% CI	Non-attend	Attend	Test Statistic	p	Effect Size	95% CI
Registration (6 missing)	14-60	42.02 (9.7)[a] n = 42	42.73 (9.2) n = 44	t = -.345	.731	.076	(-4.76, 3.35)	42.31 (9.5) n = 45	42.46 (9.5) n = 41	t = -0.075	.941	.016	(-4.21, 3.91)
4 weeks (12 missing)	30-69	53.38 (9.1) n = 39	57.98 (8.6) n = 41	t = -2.32	.023	.523	(-8.53, -0.65)	52.90 (9.2) n = 41	58.72 (8.0) n = 39	t = -3.002	.004	.677	(-9.67, -1.96)
8 weeks (18 missing)	40-70	58.91 (9.1) n = 34	61.70 (5.8) n = 40	t = -1.60	.115	.412	(-6.28, 0.70)	58.71 (9.1) n = 35	61.95 (5.6) n = 39	t = -1.864	.066	.432	(-6.69, 0.23)

Notes. [a] Standard deviation is in parentheses beside Mean. [b] The effect sizes are Cohen's *d* (see Howell, 2002, pp. 205).

Table 3

Infant Feeding Practices by Intention to Treat and Actual Workshop Attendance Analyses

Characteristic	Range	Intention to Treat Analyses						Actual Workshop Attendance Analyses					
		Control n = 45	Intervention n = 47	Test Statistic	p	Effect Size[a]	95% CI	Non-attend n = 51	Attend n = 41	Test Statistic	p	Effect Size	95% CI
Timing of first feeding (hours) [0][a]	1-48	5.44 (8.54)	2.81 (6.89)	t = 1.63	.106	.342	(-.572, 5.84)	5.02 (8.1)	2.95 (7.37)	t = 1.27	.209	.266	(-1.18, 5.31)
Formula given in hospital (# of bottles) [0]	0-40	4.07 (5.72)	2.68 (6.53)	t = 1.08	.283	.226	(-1.16, 3.93)	4.75 (7.51)	1.63 (3.18)	t = 2.48	.015	.520	(.616, 5.61)
Number of days of breastfeeding at 8 weeks postpartum [0]	2-56	49.9 (14.5)	50.4 (14.2)	t = -.158	.875	.034	(-6.42, 5.47)	47.1 (16.7)	54.0 (9.3)	t = -2.36	.020	.496	(-12.7, -1.09)
Infant feeding category[b] (8 weeks) [0]				$\chi^2 = 8.41$	.135	.302	n/a			$\chi^2 = 16.6$	.005	.425	n/a
exclusive breastfeeding by breast		26 (58%)[c]	33 (70%)					27 (53%)	32 (78%)				
exclusive by breast/some EBM		0 (0%)	1 (2%)					0 (0%)	1 (2%)				
exclusive EBM		3 (7%)	0 (0%)					3 (6%)	0 (0%)				
almost exclusive		0 (0%)	0 (0%)					0 (0%)	0 (0%)				
high		5 (11%)	2 (4%)					5 (10%)	2 (5%)				
partial		1 (2%)	4 (9%)					1 (2%)	4 (10%)				
token		0 (0%)	0 (0%)					0 (0%)	0 (0%)				
bottle-feeding (weaned)		10 (22%)	7 (15%)					15 (29%)	2 (5%)				

Notes. n/a = not applicable. [a]The number in brackets indicates the number of cases missing. [b]The infant feeding categories used were: *Exclusive breastfeeding by breast* [breastmilk by breast with no other liquids or solids except possibly vitamins]; *Exclusive by breast with some expressed breastmilk (EBM)* [breastmilk by breast with no other liquids or solids except some bottles of EBM and possibly vitamins]; *Exclusive expressed breastmilk (EBM)* [all feeds are by bottle with EBM]; *Almost exclusive* [breastmilk by breast or as EBM plus water, juice, or ritualistic teas]; *High* [1 or less bottle of artificial breastmilk [formula] daily]; *Partial* [more than 1 bottle of artificial breastmilk [formula] daily]; *Token breastfeeding* [breastfeeding for comfort and not for nutritive reasons]; *Bottle-feeding* [no breastfeeding] (adapted from Labbok & Krasovec, 1990; Statistics Canada, 2003). [c]percentage of this group

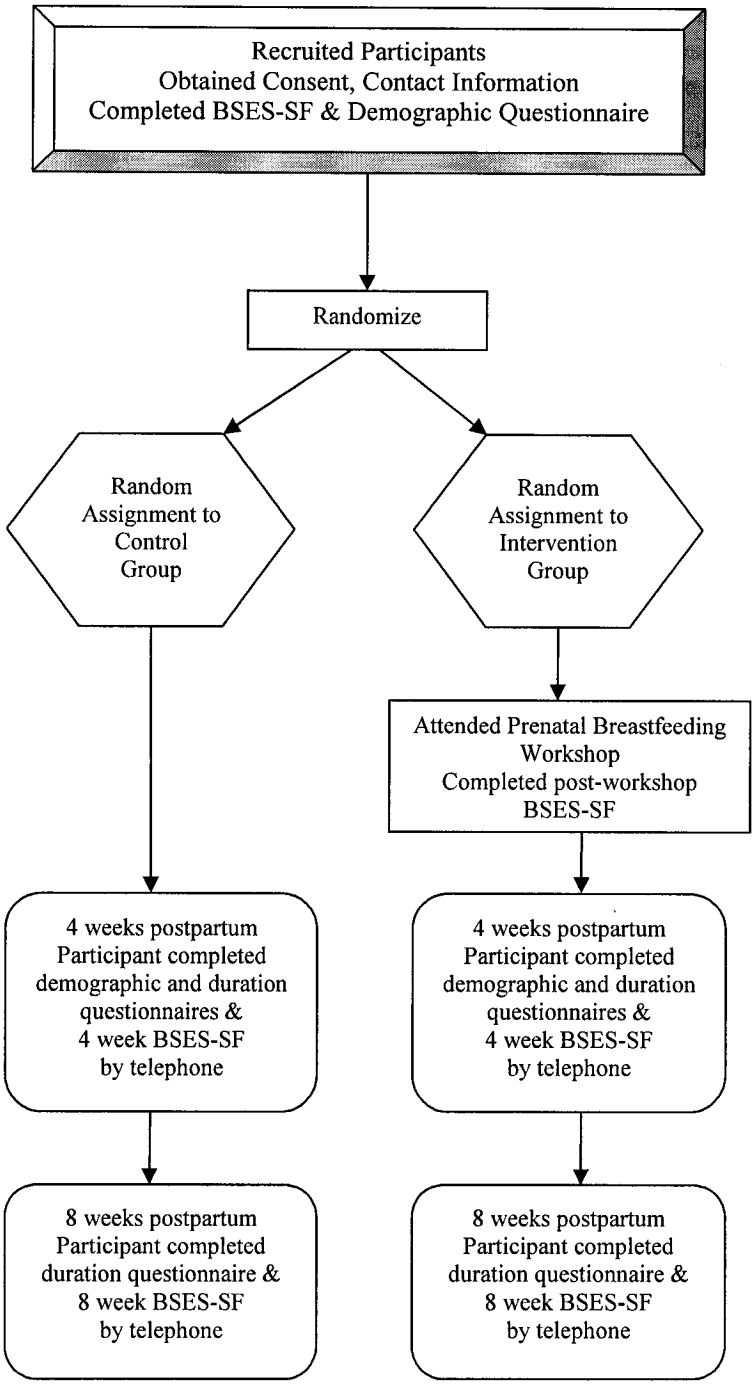

Figure 1 Schematic Diagram of Study Design

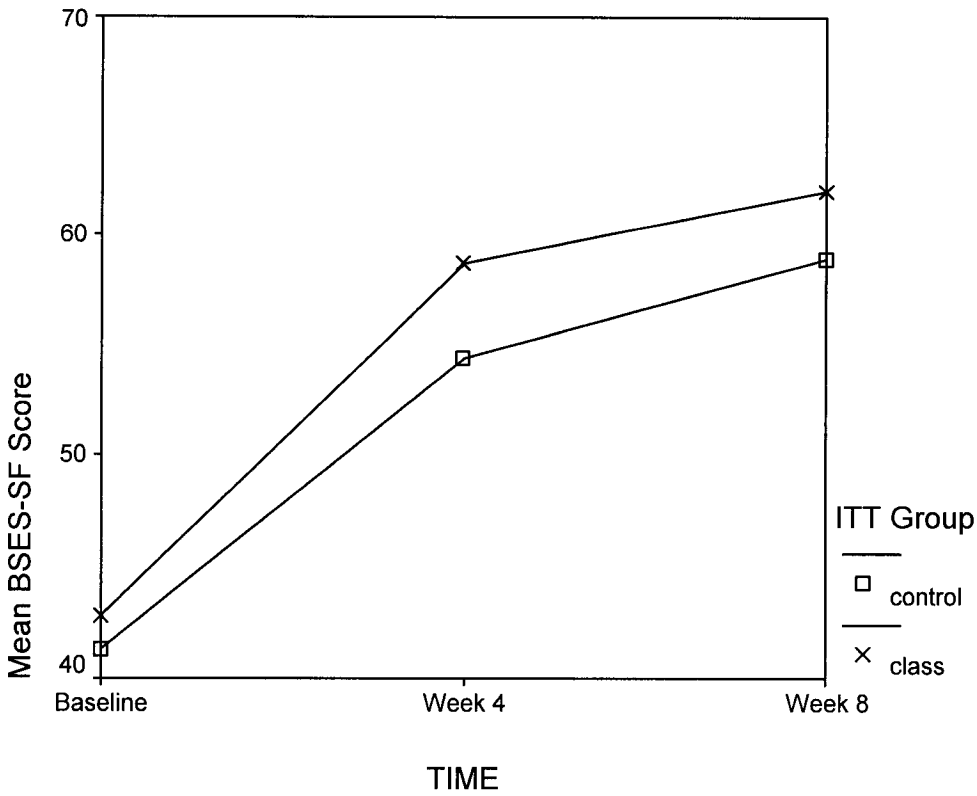

Figure 2. Comparison of Breastfeeding Self-Efficacy Scores

Chapter Five - Conclusions and Recommendations

Conclusions

Strengths

We hypothesized that the prenatal breastfeeding workshop would increase maternal breastfeeding self-efficacy and we further hypothesized that an increase in self-efficacy would increase breastfeeding duration. Maternal breastfeeding self-efficacy scores increased and this appears to be a result of the workshop, especially at four weeks. As well, it appears the workshop had an effect on the amount the attending mothers breastfed. Specifically, they were more confident about milk supply and were more often exclusively breastfeeding than the mothers in the control group.

The study benefited from a number of factors. The original pilot study formed a strong base to build this study. The nurse who completed the original study was a member of the thesis committee and was available to share her experience. Literature published since the original pilot study has continued to support the importance of maternal breastfeeding self-efficacy as a predictor of breastfeeding duration. Also, there was a validated tool to use for measuring maternal breastfeeding self-efficacy and established definitions for infant feeding categories.

Randomization appears to have been effective with an even distribution of possible confounding variables. Maternal infant feeding experience and variations in facilitator styles were accounted for by all participants being primiparas and all workshops having the same facilitator. Participants could not be blinded to the intervention but the research assistant was blinded to participant's group assignment.

The research assistant was an IBCLC and experienced with helping breastfeeding mothers. She picked up on subtle differences in infant feeding methods, differentiating between breastfeeding at breast and bottle-feeding breastmilk and this distinction was important to note, given the purpose of the prenatal breastfeeding workshop.

Limitations

The sample size was too small for some of the statistical analyses to have enough power to draw definite conclusions. For example, many of the infant feeding categories had less than five participants. A larger sample size would probably have resulted in larger numbers in these categories and the resulting statistics would have been more stable. Also, larger numbers might have provided more power and helped determine the effect of the workshop on timing of first feeding and on amount of formula supplementation in hospital.

Maternal breastfeeding self-efficacy scores were not measured if the mother had weaned. To ask questions about breastfeeding seemed inappropriate when the woman was no longer breastfeeding. In hindsight, it would have been helpful to determine her answers to the BSES-SF at the time of weaning. This gap in data meant correlations could not be established between maternal breastfeeding self-efficacy and breastfeeding duration. The data collected showed that the workshop affected duration but could not clearly show the effect maternal breastfeeding self-efficacy had on breastfeeding duration.

The breastfeeding duration and infant feeding categories were only measured at four and eight weeks. By the eighth week, many of the woman who had not attended the workshop had weaned but there were still large numbers in the exclusive breastfeeding

category. Continuing to measure duration and infant feeding categories over a longer period of time might have yielded a clearer picture.

Participation bias limited the study results because the participants were self-selecting. Overall, both the control and intervention groups had higher breastfeeding rates at eight weeks postpartum than found in national statistics. This indicates the participants may have started out more committed to, or more confident about breastfeeding than the general population. This limits generalizability to other populations.

As pointed out in chapter four, there were variations in the prenatal breastfeeding workshops. Sporadic registration and randomization, which sometimes clustered registrants into the control group leaving fewer participants needing to take a workshop, created smaller than desired group sizes. The effect of the smaller group size was uncertain. It could have ensured increased attention for each woman or it could have been a disadvantage because there were fewer participants sharing and discussing in the workshop.

The timing of the breastfeeding prenatal workshop may have not have been optimal because many of the participants were anxious about and preparing for their first birth experience. With the baby not actually present, much of the content was discussed in the abstract and this may not have been as effective as answering questions in the postpartum period when women were actually dealing with a breastfeeding baby.

Recommendations

Nursing Implications

This prenatal breastfeeding workshop is a valuable tool for increasing maternal

breastfeeding self-efficacy and exclusive breastfeeding rates. For advanced practice nurses who specialize in maternal/infant care, these results provide evidence for practice. Nurses in this area have often been puzzled about why some women, with what appears to be insurmountable problems, persevere and continue to breastfeed while other women, with seemingly minor challenges, wean their infants. The effect of self-efficacy could explain some of these phenomena.

Based on these results, an advanced practice nurse in a clinical setting could teach the principles of self-efficacy to nurses who work with mothers and these nurses would then be prepared to help mothers feel more confident about their ability to breastfeed. For the advanced practice nurse who is planning prenatal and postpartum programs for mothers, these results can be applied directly to their curriculum planning.

Further Research

The data collected in this study could be analyzed in other ways. As a Master's thesis, the analyses were kept basic and told only one part of the story. Data were collected about many other aspects of maternal care and experience including maternal perceptions of support, number of breastfeeding problems, and birth experience. This data could be further analyzed and developed.

The effect of partner attendance could be investigated. Data about partner attendance was not collected in this study. Women were told that partners were welcome and many brought the father of their baby, although some brought a female friend or relative. It would be interesting to study the dynamics of an all-female group compared with a mixed group or a group with partners compared with a group with no partners.

Strategies for facilitators to develop the skills and knowledge to effectively provide prenatal breastfeeding education need to be developed. These workshops were facilitated by one facilitator and it is uncertain the same results would be obtained by other facilitators.

Additional research about the workshops may be helpful when developing programs. Determining optimal workshop size and key elements that affect maternal breastfeeding self-efficacy is recommended. As well, establishing the ideal timing and length of the workshop could be investigated. For example, workshops may be more effective if they were held in the first or second trimester, repeated during the prenatal period, or if they were longer than 2.5 hours. It might be best to link the prenatal breastfeeding workshop with a postpartum program to ensure continuity of care.

Participants in the workshop often asked if they could call the workshop facilitator for breastfeeding help after the baby was born. This lead to the question, "What is the effect on maternal breastfeeding self-efficacy if, prenatally, a woman establishes a relationship with a professional who will provide breastfeeding support in the early postpartum period?"

Appendix C (con)

The Ottawa Hospital
L'Hôpital d'Ottawa

How Can Nurses Help Breastfeeding Mothers?

Are You Expecting Your First Baby...

... in November, December 2004
or January, February 2005?
... at The Ottawa Hospital?

Planning to Breastfeed?

We are Researching
Mother's Breastfeeding Confidence

If You Would Like to Participate in this Study

Please Contact Andrea Giffin at 228-7586

This research study has been approved by the Ottawa Hospital Research Ethics Board
(valid until June 1st, 2005)

Appendix E

Participant Information Sheet

Participant's ID # _____

Information Sheet

Title of the Study: The Effect of Prenatal Education on Maternal Breastfeeding Self-Efficacy and Breastfeeding Duration Rates

Invitation to participate:

Dear Participant:

You are being asked to participate in a breastfeeding study which will be conducted in English. Joy Noel-Weiss is a nurse and lactation consultant at The Ottawa Hospital. Joy is doing a study about breastfeeding as part of her thesis for a Master's in Nursing Science at the University of Ottawa. Many mothers stop breastfeeding before they want to because of problems. This research is trying to find ways to help mothers succeed with breastfeeding.

Two groups will be formed from all the participants in the study. One group will attend a special breastfeeding class and the other group will not attend the class. The chance of whether you attend the class is the same as flipping a coin.

All study participants will complete telephone questionnaires when their babies are 4 and 8 weeks old.

Questions you may have:

What will I be asked to do?

- Complete the registration package and hand it in to your doctor/midwife (about 15 minutes)

  Registration includes a consent form, a contact sheet, a prenatal questionnaire and a Breastfeeding Self-Efficacy Scale

- You may be asked to attend a prenatal breastfeeding class (about 2 ½ hours)

  Half of the study participants will be asked to attend a prenatal breastfeeding class at the General Campus of The Ottawa Hospital about one month before their expected due date. The participants selected for the class will receive a telephone call from the researcher to book a convenient time for the class. Participants attending the class will complete a questionnaire at the end of the class. Participants not attending the class will not have to do anything before the baby is born.

- Complete a telephone questionnaire when your baby is four weeks old (about 20 minutes)

  This includes a postpartum questionnaire, a questionnaire about how you are feeding your baby, and a Breastfeeding Confidence Scale

- Complete a telephone questionnaire when your baby is eight weeks old (about 15 minutes)

  This includes a questionnaire about how you are feeding your baby and a Breastfeeding Confidence Scale

...2

Appendix F

Consent Form

Participant's ID # _____

The Ottawa Hospital
L'Hôpital d'Ottawa

Title of the Study: The Effect of Prenatal Education on Maternal Breastfeeding Self-Efficacy and Breastfeeding Duration Rates

Consent Form

I, _____ agree to participate in this study led by Joy Noel-Weiss RN IBCLC BScN. The data from the study will help in the development of programs aimed at improving the care offered to breastfeeding families at the Ottawa Hospital.

I understand that my participation will involve:

- Registering with my doctor or midwife
- Possibly attending a prenatal breastfeeding class
- Completing a telephone questionnaire when my baby is four weeks old
- Completing a telephone questionnaire when my baby is eight weeks old

I understand that only the researchers will know my answers and that the information will be kept confidential at all times even if eventually published. I understand that my doctor/midwife and nurses will not be advised of my participation or responses and therefore this information will not influence the care received by me or my baby.

I understand that I can withdraw from the study at any time and that the care of neither me nor my baby will be affected by my decision to participate or not participate in the study.

I have read the information sheet for parents and I understand the information in this consent form. A copy of the Parent Information Sheet and Consent form will be provided to me so that I can review the information at a later date. I voluntarily consent to participate in the study.

_____ _____
Participant's Name (Please Print) Participant's Phone Number

_____ _____
Participant's Signature Date

_____
Investigator/Delegate's Name (Please Print)

_____ _____
Investigator/Delegate's Signature Date

(valid until June 1st, 2005)

Appendix G

Contact Information Form

Participant's ID # _____

Mother's Breastfeeding Confidence Study

Contact Information Sheet

Name_____

Telephone Numbers

Home_____

Work_____

Cell_____

Relative/Friend (where you may stay after the baby's birth)_____

Email Address

_____

Expected Due Date_____

Civic or General (please circle) for baby's birth

Appendix H

Prenatal Demographic Questionnaire

Participant's ID # _____

The Ottawa Hospital
L'Hôpital d'Ottawa

Mother's Breastfeeding Confidence Study

Prenatal Demographic Questionnaire

These 14 questions will help the researcher learn about the participants in the study.

Please answer by FILLING IN THE BLANK or CIRCLING the number beside your choice:

1. What will your age be when your baby is born?

   _____

2. What is your marital status?

   married/common law..... 1

   single/never married/
   separated/divorced..... 2

3. What level of education have you completed?

   High school or less.....1

   some college or university..... 2

   completed university or
   post graduate degree..... 3

4. What is your family income before taxes?

   less than $17,000.....1

   17,000 - 31,999..... 2

   32,000 - 69,999..... 3

   over 70,000..... 4

5. What is your smoking status?

   non-smoker..... 1

   1 - 2 per day..... 2

   25 per week.....3

   more than 25 per week.....4

6. Have you attended prenatal classes?

   Yes

   No

Appendix H (con)

Participant's ID # _____

7. How many books about breastfeeding have you read?

   _____

8. Have you attended any La Leche League meetings?

   Yes

   No

9. What other preparation have you done for breastfeeding

   _____

10. Did your mother breastfeed any of her children?

    Yes

    No

11. How many of your friends or other family members have breastfed?

    _____

12. When did you make your decision to breastfeed?

    before getting pregnant

    after getting pregnant

13. Describe your partner's opinion of your decision to breastfeed? (circle one)

not supportive	somewhat supportive	no opinion	supportive	very supportive
1	2	3	4	5

14. How long are you planning to breastfeed your baby?

    _____

Finally

At 4 weeks and 8 weeks postpartum we will be calling you to complete questionnaires.
Would you prefer calls in the (please circle one) 1) morning
2) afternoon
3) evening

Thank You

Appendix I

Baseline Breastfeeding Self-Efficacy Scale-Short Form

Participant's ID # _____

Baseline Breastfeeding Self-Efficacy Scale – Short Form

For each of the following statements, please choose the answer that best describes how confident you are with breastfeeding your new baby. Please mark your answer by circling the number that is closest to how you feel. There is no right or wrong answer.
1 = not at all confident 2 = not very confident 3 = sometimes confident 4 = confident 5 = very confident

		Not at all Confident				**Very Confident**
1	I can always determine that my baby is getting enough milk	1	2	3	4	5
2	I can always successfully cope with breastfeeding like I have with other challenging tasks	1	2	3	4	5
3	I can always breastfeed my baby without using formula as a supplement	1	2	3	4	5
4	I can always ensure that my baby is properly latched on for the whole feeding	1	2	3	4	5
5	I can always manage the breastfeeding situation to my satisfaction	1	2	3	4	5
6	I can always manage to breastfeed even if my baby is crying	1	2	3	4	5
7	I can always keep wanting to breastfeed	1	2	3	4	5
8	I can always comfortably breastfeed with my family members present	1	2	3	4	5
9	I can always be satisfied with my breastfeeding experience	1	2	3	4	5
10	I can always deal with the fact that breastfeeding can be time consuming	1	2	3	4	5
11	I can always finish feeding my baby on one breast before switching to the other breast	1	2	3	4	5
12	I can always continue to breastfeed my baby for every feeding	1	2	3	4	5
13	I can always manage to keep up with my baby's breastfeeding demands	1	2	3	4	5
14	I can always tell when my baby is finished breastfeeding	1	2	3	4	5

Appendix J

Pre-Workshop Questions

Prenatal Breastfeeding Workshop

(Before We Start)

What have you heard about breastfeeding?

What do you want to know about breastfeeding?

Questions that have come up during this workshop?

Appendix K

Post-Workshop Questions

Prenatal Breastfeeding Workshop

(After We Finish)

What has been helpful about this workshop?

What would you change?

Appendix L

Week 4 Postpartum Demographic Questionnaire

Participant's ID # _____

Mother's Breastfeeding Confidence Study

Postpartum (4th week) Telephone Demographic Questionnaire

These 26 questions will help the researcher learn about the participants in the study.

Some of these questions will ask for your answer and some will offer choices:

1. What type of care did you receive for the birth of your baby?

   Family Doctor..... 1

   Midwife.....2

   Obstetrician.....3

2. How far along was your pregnancy when your baby was born?

   _____(number of weeks)

3. What was your baby's weight at birth?

   _____(grams or lbs.)

4. What was the type of birth?

   caesarean

   vaginal

5. Describe any interventions in the labour/birth (eg. forceps, vacuum, epidural, induction)

   _____

   _____

6. Describe any complications for you or your baby during the labour/birth (eg. fever, prolonged 1st/2nd stage, meconium, baby needed suctioning)

   _____

   _____

7. When did you breastfeed your baby for the first time?

   _____(number of hours after birth)

Appendix L (con)

Participant's ID # _____

8. How many bottles of formula did your baby receive in the hospital? _____

9. While in the hospital, how much help, from the nurses, did you need with breastfeeding? (circle one)

none at all				very much
1	2	3	4	5

10. Since leaving the hospital, which professional services have you used for breastfeeding help? (eg. hospital clinic, public health nurse visits, private lactation consultant)

_____

11. If you answered #10, please describe how helpful these services were for you. (circle one) Indicate scale for each helper.

not at all				very much
1	2	3	4	5

12. Among friends and family, who provides ongoing breastfeeding support for you?

_____

13. Describe any breastfeeding aids you have used? (eg nipple cream, breast pump, nipple shields, breast shells, supplemental nursing systems)

_____

14. If you answered #13, please describe how helpful these aids were for you (circle one) Indicate scale for each aid.

not at all				very much
1	2	3	4	5

15. How much does your baby cry? (circle one)

not at all				very much
1	2	3	4	5

16. How helpful have friends and family been since coming home with the baby? (circle one)

not at all				very much
1	2	3	4	5

Appendix L (con)

Participant's ID # _____

17. Please describe any difficulties you have had with breastfeeding
(eg. engorgement, sore nipples, thrush, plugged duct/mastitis)

_____

18. If you answered #17, please describe how much these difficulties have affected breastfeeding? (circle one) Indicate scale for each difficulty.

not at all				very much
1	2	3	4	5

19. Please describe any significant health problems your baby has had since the birth
(for example, jaundice or dehydration)

_____

20. If you answered #19, please describe how much the baby's health problems have affected breastfeeding (circle one)

not at all				very much
1	2	3	4	5

21. Describe any significant health problems you have had since the birth
(eg. infection, postpartum hemorrhage, hypertension)

_____

22. If you answered #21, please describe how much your health problems have affected breastfeeding (circle one)

not at all				very much
1	2	3	4	5

23. Have you ever had breast surgery?

24. If yes to surgery, what type of surgery_____

25. Have you received any free formula samples?

26. If yes to free samples, who provided the free samples of formula_____

Thank you

Appendix M

Week 4 Questionnaire for Duration

Participant's ID # _____

Telephone Questionnaire for Duration Rates and Infant Feeding Categories
4 weeks

1. Is your baby being breastfed?

   Yes..... 1 (Go to question 2)
   No.....2 (Go to question 3)

2. If yes, how much is your baby breastfeeding?

   Exclusive.....1
   Almost exclusive.....2
   High..... 3
   Partial.....4
   Token breastfeeding...5
   Bottle-feeding..... 6

3. If no, how old was your baby (in days) when you stopped breastfeeding?

_____

4. Please describe your reason for stopping

_____

Definitions for Infant Feeding

To ensure consistency in reporting duration rates, definitions for breastfeeding will be:

Exclusive by breast: No other liquid or solid, except possibly vitamins.

Exclusive by breast with some EBM: No other liquid or solid, except possibly vitamins and some EBM.

Exclusive EBM: All feeds are by bottle with EBM.

Almost exclusive: Breastmilk plus water, juice, or ritualistic (eg teas) feeds given infrequently.

High: one or less bottle of artificial breastmilk (formula) per day.

Partial: More than one bottle of artificial breastmilk (formula) per day.

Token breastfeeding: Breastfeeding for comfort and not for nutritive reasons.

Bottle-feeding: No breastfeeding.

(Labbok & Krasovec, 1990)

Appendix M (con)

Week 4 Breastfeeding Self-Efficacy Scale-Short Form

4-weeks Postpartum

Breastfeeding Self-Efficacy Scale – Short Form

For each of the following statements, please choose the answer that best describes how confident you are with breastfeeding your new baby. Please mark your answer by circling the number that is closest to how you feel. There is no right or wrong answer.
1 = not at all confident 2 = not very confident 3 = sometimes confident 4 = confident 5 = very confident

		Not at all Confident				**Very Confident**
1	I can always determine that my baby is getting enough milk	1	2	3	4	5
2	I can always successfully cope with breastfeeding like I have with other challenging tasks	1	2	3	4	5
3	I can always breastfeed my baby without using formula as a supplement	1	2	3	4	5
4	I can always ensure that my baby is properly latched on for the whole feeding	1	2	3	4	5
5	I can always manage the breastfeeding situation to my satisfaction	1	2	3	4	5
6	I can always manage to breastfeed even if my baby is crying	1	2	3	4	5
7	I can always keep wanting to breastfeed	1	2	3	4	5
8	I can always comfortably breastfeed with my family members present	1	2	3	4	5
9	I can always be satisfied with my breastfeeding experience	1	2	3	4	5
10	I can always deal with the fact that breastfeeding can be time consuming	1	2	3	4	5
11	I can always finish feeding my baby on one breast before switching to the other breast	1	2	3	4	5
12	I can always continue to breastfeed my baby for every feeding	1	2	3	4	5
13	I can always manage to keep up with my baby's breastfeeding demands	1	2	3	4	5
14	I can always tell when my baby is finished breastfeeding	1	2	3	4	5

Appendix N

Week 8 Questionnaire for Duration

Participant's ID # _____

The Ottawa Hospital
L'Hôpital d'Ottawa

Telephone Questionnaire for Duration Rates and Infant Feeding Categories
8 weeks

1. Is your baby being breastfed?

   Yes..... 1 (Go to question 2)
   No.....2 (Go to question 3)

2. If yes, how much is your baby breastfeeding?

   Exclusive.....1
   Almost exclusive.....2
   High..... 3
   Partial.....4
   Token breastfeeding...5
   Bottle-feeding..... 6

3. If no, how old was your baby (in days) when you stopped breastfeeding?

   _____

4. Please describe your reason for stopping

   _____

Definitions for Infant Feeding

To ensure consistency in reporting duration rates, definitions for breastfeeding will be:

Exclusive by breast: No other liquid or solid, except possibly vitamins.

Exclusive by breast with some EBM: No other liquid or solid, except possibly vitamins and some EBM.

Exclusive EBM: All feeds are by bottle with EBM.

Almost exclusive: Breastmilk plus water, juice, or ritualistic (eg teas) feeds given infrequently.

High: one or less bottle of artificial breastmilk (formula) per day.

Partial: More than one bottle of artificial breastmilk (formula) per day.

Token breastfeeding: Breastfeeding for comfort and not for nutritive reasons.

Bottle-feeding: No breastfeeding.

(Labbok & Krasovec, 1990)

Appendix N (con)

Week 8 Breastfeeding Self-Efficacy Scale-Short Form

Participant's ID # _____

8-weeks Postpartum

Breastfeeding Self-Efficacy Scale – Short Form

For each of the following statements, please choose the answer that best describes how confident you are with breastfeeding your new baby. Please mark your answer by circling the number that is closest to how you feel. There is no right or wrong answer.
1 = not at all confident 2 = not very confident 3 = sometimes confident 4 = confident 5 = very confident

		Not at all Confident				**Very Confident**
1	I can always determine that my baby is getting enough milk	1	2	3	4	5
2	I can always successfully cope with breastfeeding like I have with other challenging tasks	1	2	3	4	5
3	I can always breastfeed my baby without using formula as a supplement	1	2	3	4	5
4	I can always ensure that my baby is properly latched on for the whole feeding	1	2	3	4	5
5	I can always manage the breastfeeding situation to my satisfaction	1	2	3	4	5
6	I can always manage to breastfeed even if my baby is crying	1	2	3	4	5
7	I can always keep wanting to breastfeed	1	2	3	4	5
8	I can always comfortably breastfeed with my family members present	1	2	3	4	5
9	I can always be satisfied with my breastfeeding experience	1	2	3	4	5
10	I can always deal with the fact that breastfeeding can be time consuming	1	2	3	4	5
11	I can always finish feeding my baby on one breast before switching to the other breast	1	2	3	4	5
12	I can always continue to breastfeed my baby for every feeding	1	2	3	4	5
13	I can always manage to keep up with my baby's breastfeeding demands	1	2	3	4	5
14	I can always tell when my baby is finished breastfeeding	1	2	3	4	5