Professional Lactation Counseling and Support for Increasing the Rate and Duration on Breastfeeding

by

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Declarations

I declare that this dissertation represents my own work, except where due acknowledgment is made. It has not been previously included in a thesis, dissertation, or report submitted to this university or to any other institution for a degree, diploma, or other qualifications.

Signed ………………………………
Chan Mei Fung Shirley
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Breast milk is well recognized as the best natural food for infants and is also known to provide immediate and long-term health benefits for infants. According to the Baby- Friendly Hospital Initiative Hong Kong Association, the breastfeeding initiation rate in Hong Kong has been continuously increasing. For duration of breastfeeding, World Health Organization recommends exclusive breastfeeding for six months and the introduction of complementary food should start since the age of two. Despite active promotion of breastfeeding up to 6 months, the exclusive breastfeeding rate is still low and women in Hong Kong generally stop breastfeeding within the first few months.

The Department of Health in Hong Kong facilitates a supportive environment in all Maternal and Child Health centres to promote breastfeeding. To support mothers
exclusively breastfeed for the first six months, a structured individualized lactation counseling and support is worth to implement when mothers are discharged from hospital around 48 hours and transfer to primary care. The individualized lactation counseling provides latching technique to ensure proper attachment and positioning to prevent early complications at the early postnatal. It also continues to follow up until 1-to-2 weeks after delivery.

The objective of this study is to evaluate the effectiveness of the individualized professional lactation counseling and support at early postnatal periods to prolong the duration of breastfeeding. Eight studies were identified after comprehensive literature review and the quality of these studies was assessed. An evidence-based guideline was developed based on the analyzed research findings. The implementation and evaluation of the proposed guideline were compiled in this translational research.

An evidence-based guideline for providing individualized lactation counseling and support was developed to help health professionals to provide competent and effective breastfeeding counseling to mothers. The purpose of the guideline is to encourage mothers to breastfeed up to six months.
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Chapter 1: Introduction

Introduction

Breastfeeding (BF) is a fundamental issue in public health. Breastfeeding can reduce the risk of multiple diseases, including cardiovascular diseases, infectious diseases and metabolism problem (Stuebe, 2009). According to the statistics (Baby-Friendly Hospital Initiative Hong Kong Association, 2010), majority of mothers in Hong Kong prefer breastfeeding. However, despite active promotion of breastfeeding, exclusive breastfeeding up to 6 months (EBF) is actually rare and women stop breastfeeding within the first few months. Thus, it is important to explore the effectiveness of supportive interventions for the sustainability of breastfeeding.

1.1 Background

Breastfeeding provides optimal and ideal food for infants’ health, growth and development. World Health Organization (WHO, 2001) recommends mothers to exclusively breastfeed their babies in the first 6 months of their lives. WHO also recommends mothers to provide complementary food after the first 6 months and continue breastfeeding up to 24 months or beyond. Exclusive breastfeeding is defined as infant only receiving breast milk (WHO, 2001). In other words, they do not have any additional food or drink including water. Many professional organizations support breastfeeding (e.g. the American Academy of Pediatrics and Centers for Disease Control and Prevention). The Healthy People 2020 targets the breastfeed-initiative
rate, the breastfeed rate at 6 months, the breastfeed rate at 12 months and EBF rate to be 81.9%, 60.6%, 34.1% and 25.5% respectively (Centers for Disease Control and Prevention, 2012).

The benefits of breastfeeding for infants and mothers have been widely recognized. For infants, breast milk helps sensory and cognitive development and protects them against infectious and chronic diseases. It also helps reduce infant’s risk of mortality due to common childhood diseases (e.g. diarrhea or pneumonia) and increases their recovery rate (WHO, 2012). The health benefits of breastfeeding is dose-dependent (Lawrence, 1997). The longer the baby is breastfed, the greater the benefits she may experience. Breastfeeding appears to reduce the risk of chronic diseases such as obesity and hypertension, diabetes, and cancer.

WHO (2012) also stated that breastfeeding improve mothers’ health and well-being. It is important to space their children, reduce the risk of ovarian and breast cancer and increase family and national resources. Initiation of breastfeeding and increase in breastfeeding duration is known to bring health, immunological, nutritional, economical, psychological, and environmental benefits to mothers (American Dietetic Association, 2001).

1.2 Affirming the Need

Since 1992, the Baby-Friendly Hospital Initiative Hong Kong Association
has conducted a prospective survey to examine the ever-breastfeeding rates on discharge from maternity units in a yearly basis. This survey records the initiation rate of breastfeeding and it has shown that there have been a continuous increase from 19% in 1992 to 79.2% in 2010 (Baby-Friendly Hospital Initiative Hong Kong Association, 2010). The increase may perhaps due to the robust public promotion on breastfeeding in the past twenty years. In recent years, there are increasing number of mothers choose to breastfeed their infants, a phenomenon that is similar to other developed countries. The rates of any breastfeeding at the 1st month, 3rd months, 6th months, and 12th month are 63%, 37.3%, 26.9%, and 12.5%, respectively. About half of breastfeeding mothers were exclusive breastfeeding (Tarrant et al., 2010). Unfortunately, breastfeeding rate declines when the baby grows. Despite the improving trend of initiation, Hong Kong mothers’ duration of breastfeeding is short. It is much shorter than the recommendation (i.e. 6 months) from the Healthy People 2020 and the Department of health (DH), despite the continuous support of breastfeeding from the world-wide and local organizations. Most of Hong Kong women wean off breastfeeding before 6 months postpartum.

In current practice, more than 75 % of women get prenatal, delivery, and postpartum care from government public hospitals and outpatient clinics by the Department of Health (Dennis, 2002). Public hospitals and all public outpatient clinics
(Maternal and Child Health centers) have employed supportive policies for breastfeeding and have allocated time and resources for breastfeeding education. The public healthcare setting provides multiple supportive services to breastfeeding. They include antenatal education and workshops, hand-on technique, support groups, hotlines, information booklets, leaflets and websites.

However, early discharge from public hospitals (within 48 hours) often causes the offer of individual professional lactation coaching for the intended breastfeeding mothers impossible. Most of the new mothers now go home before their breastfeeding behaviors have been well established. Hence, without help from the professionals, they often encounter breastfeeding difficulties. In addition, given the manpower shortage and heavy workload in public hospitals, professionals mostly have limited time to spend on individualized counseling.

Effective management of breastfeeding problems in the early postnatal period is significant for preventing the early wean off of breastfeeding. Education can help women to overcome common problems on breastfeeding (Tarrant, Dodgson, & Tsang Fei, 2002). Early cessation of exclusive breastfeeding among mothers may be related to the lack of professional support to resolve the early postpartum breastfeeding problems and lack of community, family, and workforce support. Many mothers stop breastfeeding due to perceived difficulties instead of their choice. (Dennis, 2002).
Difficulties on breastfeeding and perceived having not enough milk during the early postnatal also relate to the shorter duration of breastfeeding. All these encourage early introduction of the formula supplement (Tarrant et al., 2010). Earlier breastfeeding promotion programs have been successful to increase breastfeeding initiation rates. Now, the focus must change to help the first time mothers to breastfeed exclusively and sustain for longer time.

Sikorski et al. (2003) found that the use of additional professional support and face-to-face interview can prolong breastfeeding more effective than the telephone support only (Sikorski, Renfrew, Pindoria, & Wade, 2003). A US meta-analysis study found that the use of combined education, problem-solving, and counseling is the most successful strategy to promote breastfeeding (Rockville, 2003). Brief and small group interventions without face-to-face interactions are found to be ineffective. Hand-on instructions on breastfeeding techniques, demand feeding, and post-natal support are essential for supporting breastfeeding. Evidence shows that it is better to show mothers how to feed their infants themselves rather than instruct them how to feed (Hoddinott & Pill, 2000). Therefore, the proposed individual lactation counseling includes hand-on instructions on breastfeeding techniques for correct positioning and attachment through face-to-face interactions and encouraging demand feeding. The purpose of the counseling is to support mothers at early postnatal and the support will
be continued through telephone follow-up. The mothers are taught by professionals with skillful breastfeeding technique and this enable them latch their babies for themselves. Mothers will be encouraged to continue breastfeeding if they have early success of breastfeeding in hospital and have a supportive husband, family and health professionals (Ingram, Johnson, & Greenwood, 2002). Therefore, the successful of breastfeeding is affected by multiple factors.

1.3 Objectives and Significance

A correct positioning and good attachment technique is useful in prolonging breastfeeding and reducing breastfeeding problems. Educating mother these techniques would be useful for the establishment and maintenance of breastfeeding and later prolong their breastfeeding duration. Breastfeeding is also a learned skill for newborns and mothers through education, practice, and observation. (Henderson, Stamp, & Pincombe, 2001). Therefore, babies and mothers improve the skills through repeated practice. Mothers will gain confidence in her ability to care for her newborn and breastfeeding. Establishing good breastfeeding practices in the first days is critical to the health of the infant and to the breastfeeding success.

In the current practice, hospitals do provide breastfeeding coaching to the mothers who intent to breastfeed their babies. However, majority of these mothers miss the coaching. This is because mothers are too tried after the delivery or early
discharge and the heavy workload encountered by the midwives. After discharge, mothers can still learn breastfeeding skills in the clinical setting in four-to-seven days after delivery. In between, they can call the hotlines provided by hospitals or Department of health when they encounter breastfeeding difficulties. Home visits are rarely provided by the hospitals because there is no sufficient manpower to support these services. So the proposed intervention is to provide the individualized lactation counseling through face-to-face teaching within 48 hours and when they transfer to primary care. The intervention will teach breastfeeding with the use of pamphlet / video and then having telephone follow-up one to two weeks after delivery. The goal is to sustain mothers’ breastfeeding practice.

Objective:

The objective of this study is to evaluate the effectiveness of individualized professional lactation counseling and support at early postnatal periods to sustain mothers’ duration of breastfeeding.

Research question:

In the public health setting, does individualized professional lactation counseling and support at early postnatal period women increase mothers’ duration of breastfeeding?

PICO:
P: Mothers who wish to breastfeed.

I: Individualized professional lactation counseling and support

C: The current practice in public health setting

O: To prolong mothers’ duration of breastfeeding to 6 months postnatal.
Chapter 2: Critical Appraisal

2.1 Search and Appraisal Strategies

Search Strategies

A systematic literature search was undertaken to evaluate studies on extending the duration of breastfeeding. Four electronic databases were searched including Pub Med, Ovid Medline, CINAHL Plus and Cochrane Library. The latest search was done on 1st September 2012. To obtain as many relevant studies as possible, no restriction on publication year was set. In total, 631 articles were yielded (452 articles from Pub Med, 66 articles from Ovid Medline, 105 articles from CINAHL Plus and 8 articles from Cochrane Library). Details of the search are shown by flowchart in Appendix A.

The sets of keywords used in the databases search are “breastfeeding” or “breast feeding” AND “individualized counseling”, “positioning and attachment”, “one-to-one”, and “professional support”. After reading the abstracts and titles for screening out the duplicated articles, 168 articles were identified. After searching the full text, forty-five articles were identified. More advanced search was done by a manual search. All of the abstracts of these articles were reviewed according to the inclusion criteria and eight articles were identified.

Inclusion criteria:

- Individual lactation support by health professionals (e.g. midwife, lactation
The primary outcome of the study is the duration of BF primary studies. English in language. Randomized controlled trials.

Exclusion Criteria:

- Complicated pregnancy and labour (e.g. caesarian section and twins)
- Separation from mothers after birth (e.g. preterm, neonatal jaundice)
- Medical and surgical problems of both mothers and newborns.

Critical Appraisal

Systematic literature review was done for all these 8 selected studies. All the studies were randomized controlled trials. During the process of review, information was analyzed to form the evidence table. The table of evidence includes the type and country of the study, the level of evidence, the characteristics of subjects, intervention and comparison, the follow up length, outcomes measures, and effect size. The evidence table of the eight studies was shown in Appendix B.

The publication years were from 2000 to 2011. These studies were conducted in various countries: two in Asia (Singapore and Jordan); two in Oceania (Australia), one in Europe (England); two in America (USA and Canada); and one in Africa.
(Ghana). The sample sizes varied from 51 to 450 women or mothers-babies pairs. The length of follow up ranged from 4 weeks to 12 months. The primary outcomes of all the studies were the duration of breastfeeding. Seven studies measured breastfeeding in terms of the rates of exclusive or any breastfeeding and one reflected it by computing the cumulative breastfeeding intensity score. A higher score shows a greater intensity of formula feeding and a lower score reflect a greater intensity of breastfeeding (Bonuck, Trombley, Freeman, & McKee, 2005).

All included studies were assessed by the ten questions in the Critical Appraisal Skills Programme (CASP) by the Public Health Resources Unit of the National Health Service (NHS) in England. The CASP checklist for randomized controlled trials was used and shown in Appendix C. The quality of the studies was assessed with the Scottish Intercollegiate Guidelines Network (SIGN) appraisal checklists, and is shown in Appendix D. Two main categories in both internal validity and overall assessment are assessed. The results of these eight studies in the levels of evidence ranged from 1++ to 1-. Three are 1++, four are 1+, and one is 1-. The results are shown in Appendix E.

2.2 Result

Study Characteristics

Six studies were conducted in developed countries (Su et al., 2007, Bonuck et
al., 2005, Henderson et al., 2001, Wallace et al., 2006, Porteous et al., 2000, and (McDonald, Henderson, Faulkner, Evans, & Hagan, 2010) and two were in developing countries (Aidam et al., 2005 and Khresheh et al., 2011). Seven studies reported there had high initiation rates in their countries that conducted the studies (Su et al., 2007, Bonuck et al., 2005, Henderson et al., 2001, Wallace et al., 2006, Porteous et al., 2000, McDonald et al., 2010 and Khresheh et al., 2011). Except one studies conducted in Ghana (Aidam, Perez-Escamilla, & Lartey, 2005), the initiation rates was only 53.4%.

The participants recruited in three studies were primiparous women (Henderson et al., 2001, Wallace et al., 2006, and Khresheh et al., 2011); one recruited women that were self-identified as unsupported (Porteous, Kaufman, & Rush, 2000). In three studies, the participants were in low income group (Su et al., 2007, Bonuck et al., 2005, and Aidam et al., 2005) and one with low educational level (McDonald et al., 2010).

There were six studies using combined interventions (Su et al., 2007, Bonuck et al., 2005, Aidam et al., 2005, Porteous et al., 2000, Khresheh et al., 2011 and McDonald et al., 2010) and two studies used one intervention only (Henderson et al., 2001; Wallace et al., 2006). Interventions in all these studies provided early postnatal individual lactation support, one-to-one hand-on technique in latching, good
positioning and attachment to prevent early postnatal complications (e.g. sore nipples and insufficient of breast milk). The combination interventions included antenatal education, face-to-face hospital visits, home visits and follow-up telephone call during the postnatal period. The interventions were provided by midwives (Wallace et al., 2006, Porteous et al., 2000, McDonald et al., 2010 and Henderson et al., 2001), lactation counselors (Su et al., 2007 and Bonuck et al., 2005), by counselors (nurses and nutritionist) (Aidam et al., 2005), and researcher (nurses) (Khresheh et al., 2011).

Methodological Quality

All studies stated the research questions appropriately and clearly and addressed the purpose of the interventions to access the effect of individualized professional support on the duration of breastfeeding.

Seven studies clearly described the randomization methods; subjects were randomized either into the intervention group or control group to minimize the selection bias. The investigators did not know the randomization assignments after obtaining the consent. Participants were allocated by a computerized, block randomization procedure, so as to ensure equal distribution of participants by stratification (Su et al., 2007, Henderson et al., 2001, Wallace et al., 2006 and Porteous et al., 2000). One study employed a list of random codes and secured them in a sealed envelop (Bonuck et al., 2005) and two performed the process by selecting
from the sealed, opaque envelopes (Khresheh et al., 2011 and McDonald et al., 2010).

The randomization procedure in one study was poor in which they addressed it by choosing a piece of paper that determining their allocation and that may cause selection bias (Aidam et al., 2005). The randomization method was not a formal one but be conducted easily.

Six of the studies had adequate concealment (Su et al., 2007, Bonuck et al., 2005, Henderson et al., 2001, Wallace et al., 2006 and Porteous et al., 2000). These studies ensured that participants and researchers were blind to participants’ allocation groups and two studies did not mention about the concealment (Aidam et al., 2005 and Khresheh et al., 2011).

Five of the studies only addressed the single blinding treatment allocation because double blinding was impossible (Bonuck et al., 2005, Bonuck et al., 2005 Henderson et al., 2001, Wallace et al., 2006 and Porteous et al., 2000). Investigators in these studies were not blinded to the group allocation. The healthcare professionals had to carry out the treatment of the group assignment and therefore the outcome assessors were blinded. The other three did not address the blinding procedure.

All studies clearly stated the components of the intervention groups in comparison to the control group. So, difference between the intervention and control groups was under investigation.
The drop-out rates were reported in all studies. Three had less than 5% of drop-out in either the intervention or control groups (Henderson et al., 2001, Porteous et al., 2000 and McDonald et al., 2010). Reasons of dropping out were loss of contact and moving out the area. One study had a high drop-out rate of 37.3% in intervention group and 33.8% in control groups (Khresheh et al., 2011). It was because high rates of lost of follow up due to no response to phone calls and moving conflicts. Participants who retained in that study were in younger age, unemployed, low income, and lived in city. Five studies mentioned that all the subjects were analyzed and referred as intention to treat.

Overall, three studies achieved a high quality rating with a very low risk of bias according to CASP criteria and provided high-level evidence (Su et al., 2007, Wallace et al., 2006 and Porteous et al., 2000). The researchers minimized biases by using randomization, concealment, and blinding. The drop-out rates in these studies were below 20%. The outcome measurements were assessed by standard questionnaires through interview or telephone and/or home visits. The content of the standard questionnaire included any breastfeeding or exclusive breastfeeding at 4 weeks to 6 months, which is similar to our primary outcome. Three studies achieved a medium quality rating with a low risk of bias (Bonuck et al., 2005, Henderson et al., 2001, Khresheh et al., 2011 and McDonald et al., 2010). Randomization, concealment,
blinding and the outcome measurement were not well addressed in these studies. Aidam et al.’s study (2005) was rated as low quality with a high risk of bias because of the informal randomization.

2.3 Summary and Synthesis

All eight studies were published in English from the year 2000 to 2011. They included individual lactation counseling and support on the postnatal periods. Seven studies had high initiation rates. The validity of these studies was clearly described by means of CASP. The primary outcome of these studies was the duration of breastfeeding. Seven studies provided individual lactation counseling at early postnatal (i.e. less than 48 hours after delivery in hospital). The postnatal support through information, education, support and counseling on breastfeeding were provided in hospital after delivery in the form of one-to-one interviews, postnatal visits in a clinic or at home or telephone calls.

The interventions of seven studies provided early postnatal individual lactation support, including hand-on instructions in latching, good positioning, and techniques to prevent complications (Su et al., 2007, Bonuck et al., 2005, Aidam et al., 2005, Henderson et al., 2001, Porteous et al., 2000, Khresheh et al., 2011 and McDonald et al., 2010). Four studies were reported to be effective as participants’ in their study extended the duration of breastfeeding to 17 weeks to 24 weeks. Three of the studies
showed that antenatal education was effective to extend the duration of breastfeeding. One study provided antenatal education through video “14 Steps to Better Breastfeeding” and individual lactation hand-on instruction during home visits on Day 3 and 1-2 weeks (Su et al., 2007). Another one provided two prenatal sessions and postnatal hand-on instruction during the hospital stay and follow-up by home visits and/ or telephone calls weekly (Bonuck et al., 2005). Aidam et al. (2005) provided pre-natal education materials and sessions, hand-on practice in 48 hours peri-natal in hospital after delivery and eight home visits in post-natal from 1 week to 24 weeks. They all provided the hand-on technique during hospital visits within 24 to 72 hours (Su et al., 2007, Bonuck et al., 2005, Aidam et al., 2005, and Porteous et al., 2000).

Six studies used combined interventions (antenatal education, individual counseling, telephone and home visits) and two studies used single intervention (individual counseling). Four studies which employed a combined intervention have shown a statistically significant improvement in the duration of exclusive breastfeeding from 4 week (Porteous et al., 2000), 20 weeks (Bonuck et al., 2005) to 24 weeks (Su et al., 2007 and Aidam et al., 2005). Overall, all studies with combined interventions that included home visits were considered as effective in overall. Home visits that focused on the hand-on instructions in latching promote proper positioning. Prevention and management of complications were most effective in increasing
duration of breastfeeding. The home visits providing information, education, support and counseling within 48 hours to 1-2 weeks after discharge were effective. On the other hand, the two studies with single intervention (one-to-one interviews) did not significantly extend the duration on breastfeeding (Henderson et al., 2001 and Wallace et al., 2006).

The combined interventions include telephone visits to support the mothers. Only one study showed significant findings to support duration to 4 weekly postnatal. The study provided telephone call weekly till 4 weeks postnatal (Porteous et al., 2000). On the contrary, another study showed non-significant findings to telephone calls on 2 and 4 months (Khresheh, Suhaimat, Jalamdeh, & Barclay, 2011).

The intervention which was carried out by lactation consultants showed that this method is effective in sustaining the duration of breastfeeding (Su et al., 2007 and Bonuck et al., 2005). The effectiveness of interventions is showed in Appendix F.

To conclude, based on the high quality studies with low risk of bias, it is suggested that the individual lactation counseling is effective in sustaining the duration of breastfeeding. Latching technique should also be provided to ensure proper attachment and positioning to prevent early complications at the early postnatal (within 48 hours after delivery) and continue to follow up at 1-2 weeks after delivery. Face-to-face interviewing and combined interventions including antenatal education
and follow-up home visits were found to improve the duration of breastfeeding. Intervention should be carried by lactation consultants.

2.4 Implications for Practice

With reference to the results of all these studies, they can be generalized to the Hong Kong public healthcare setting. It is because most of the selected studies that had high initiation rates, which is similar to the situation in Hong Kong. Healthcare professionals should address certain recommendations to increase the duration of breastfeeding effectively.

  Firstly, public and private hospitals should be liaised to provide hand-on instructions in latching and proper positioning to prevent complications before discharge.

  Secondly, the collaboration of Hospital Authority and Department Health is very important. They should cooperate to arrange early visits in public healthcare settings in order to provide subsequent lactation support. Moreover, healthcare professionals in public sector are recommended to enhance their skills through structured breastfeeding training. Sponsorship of lactation consultant training can be one kind of incentive to promote professional breastfeeding training.

  Thirdly, home visits are effective to support the duration on breastfeeding. But due to the heavy workload in the public healthcare setting, subsequent visits are more
feasible to be carried out in community health centres.

Fourthly, antenatal education should be strengthened to promote breastfeeding in public healthcare setting. Lastly, postnatal telephone follow-up should be provided for breastfeeding mothers. It is because the existing breastfeeding hotline does not address individual difficulties adequately.
Chapter 3: Translation and Application

After the critical appraisal of eight reviewed studies, the individualized lactation counseling and support is found to be effective to prolong the duration of breastfeeding. It helps mothers to establish and maintain successful breastfeeding, thereby preventing the complications that often lead to cessation of breastfeeding (Aidam, Perez-Escamilla, & Larre, 2005; Bonuck, Trombley, Freeman, & McKee, 2005; Henderson, Stamp, & Pincombe, 2001; Khresheh, Suhaimat, Jalamdeh, & Barclay, 2011; McDonald, Henderson, Faulkner, Evans, & Hagan, 2010; Porteous, Kaufman, & Rush, 2000; Su et al., 2007; Wallace et al., 2006). This chapter examines the potential of implementing a breastfeeding intervention in Maternal and Child Health Services Centers (MCHC) of the Department of Health in Hong Kong. Also, it examines the transferability and feasibility of the findings to launch this innovation. It also evaluates the cost-benefit ratio of this innovation in the healthcare settings.

3.1 Implementation Potential

Given the short duration rate of breastfeeding and early cessation of breastfeeding, it is worth to implement this structured individual lactation counseling and support to the mothers in Hong Kong for sustaining the breastfeeding in the healthcare setting. The innovation can provide health benefits to mothers and infants from breastfeeding.

Target Audience
The target audiences are mothers who have just undergone uneventful deliveries and are discharged from hospital around 48 hours after delivery. They will be recruited during their first visit to the MCHC. They will be mothers who wish to breastfeed but may encounter some difficulties in breastfeeding. They may or may not receive the breastfeeding support by the hospital nurses. They may continue to attend the MCHCs for the postnatal checkup services and the immunization program for their infants. Their first visit to MCHCs is the optimal time to capture them in these early postnatal periods as this is the receptive period for them toward breastfeeding. So, this may increase their chances of breastfeeding and reduce the incidence of breastfeeding problems. Therefore, it is significant to launch an intervention in the MCHCS of the Department of Health.

3.2 Transferability of the Findings

Comparing the setting, target population and philosophy of care and time frame of the innovation, the existing setting has similarity with the eight identified studies. The comparison of the current healthcare setting and the eight reviewed randomized controlled trials found the proposed innovation matches the present clinical setting.

Setting

The setting of the reviewed studies was either hospitals or community centres, which are different to the existing clinical setting (MCHCs). But the main theme of
providing breastfeeding counseling was in the early postnatal periods to help mothers establish breastfeeding and prevent early complications that may lead to an early cessation. The hospitals of the reviewed studies were designated as Baby Friendly in which they refuse the free or low-cost breast milk substitutes, feeding bottles or teats, and had implemented ten steps to support breastfeeding (UNICEF, 2012). The MCHC in the present clinical setting has also implemented the ten steps to support and promote breastfeeding. The interventions of the identified studies were provided by midwives, lactation consultants, nurses and nutritionist during the hospital stays, home visits and/or by telephone counseling. These differ from the Hong Kong hospitals. In Hong Kong, mothers are tired and exhausted after delivery. Also, midwives in the hospitals have limited time to educate mothers and follow up the progress of breastfeeding due to the heavy workload and shortage of manpower. Most of the mothers receive the individualized counseling and support when they attend the MCHCs for maternity and child care services at 48 hours in the postnatal periods. Home visits are rarely provided. Similarly, the innovation will be provided by midwives, lactation consultants, and registered nurses in MCHCs that are well-trained in breastfeeding. So, the proposed innovation has similar setting and service providers with the reviewed studies.

Characteristics of target population
The characteristics of the participants in the eight reviewed studies are similar with our clients in MCHC. The age of the eight studies is similar to the MCHC clients, ranging from 20 to 39. The background educational level of the studies was also similar to that of MCHC clients. For example, most of the participants had secondary school education level or above. Most of the target populations were primiparous, singleton pregnancy and intended to breastfeeding. The only difference is that mothers in our target populations are mostly working mothers and married whereas mothers of the reviewed studies are unmarried and not working.

This healthcare setting involves the healthcare professionals including registered nurses, midwives, and lactation consultants in the centers. They all are well trained in breastfeeding and can provide supportive services to the mothers on breastfeeding.

**Philosophy of care**

The Breastfeeding policy of the Department of Health aims at promoting, protecting and supporting breastfeeding. The breastfeeding policy advocates through the implementation of "Ten Steps to Successful Breastfeeding" and "International Code of Marketing of Breast milk Substitutes", which has been applied in the Maternal & Child Health Centres and created a positive environment in all service settings / offices to support breastfeeding to clients and employees.” (Department of
Health, 2011). The philosophy of care of our department is to promote positive environment to support breastfeeding; improve breastfeeding skills and increase confidence of the mothers; and prevent breastfeeding complications and early cessation. The philosophy of care of the proposed innovation is to provide individual lactation counseling and support. It will be achieved by providing informative and evidence-based practice to support mothers on breastfeeding, in order to gain confidence in breastfeeding to prolong the duration of breastfeeding. Therefore, the philosophy of care of the proposed innovation is in parallel with the existing breastfeeding policy of the department.

**Potential clients being benefited from the innovation**

All mothers who wish to breastfeeding and attend the MCHC services can be benefit from the proposed innovation. The proposed innovation will first be implemented in one designated MCHC in New Territories East. According to the statistics of designated clinic, there are around 200 mothers’ and babies’ pairs attending the designated clinic each month as new cases of infant care. Approximately 90% of these cases intent to breastfeed and around 60% of clients meet the inclusion criteria and request for the lactation counseling. Therefore, an estimate of 108 clients can be benefited from the innovation per month. The proposed intervention will be implemented and evaluated for those target mothers from the first visit to attend the
services.

**Time frame of the innovation**

The proposed innovation will take one and half years to implement. This includes three months for proposal preparation and approval of the program and three months for piloting the program. Adjustment will be done for the feasibility of the innovation. Actual implementation will be carried out in the next three months and another six months will be needed for obtaining data for the evaluation. An evaluation report will be compiled which will take approximately another three months.

Consents are needed to obtain from these mothers. After the implementation, mothers will be continuously followed up for breastfeeding either in clinics or by phone. A new form is designed for collecting data from target clients and the duration of breastfeeding which are kept in the Child Health Care Record will be retrieved. A lactation consultant in the designed MCHC will take the lead of the innovation. This time frame is suitable for implementing the innovation in the target healthcare setting. The details refer to Appendix G.

**3.3 Feasibility**

The Department of Health (DH) has always been actively involved in promoting, protecting and supporting breastfeeding. The Family Health Service (FHS) of the DH always supports and facilitates breastfeeding and have implemented a
supporting breastfeeding policy in all MCHCs. Breastfeeding promotion constitutes a major activity in MCHCs for antenatal and postnatal clients, as well as their families. Also, staffs of MCHCs have received structured training to enhance their competency in providing effective counseling and management for breastfeeding mothers. This breastfeeding structured training is an in-service training provided to all staffs of the MCHCs. Therefore, it will be feasible to implement the intervention in the practice of MCHC.

Before administering the innovation, it is necessary to get approval and support from the service head of Family Health Service. The involved nurses have the freedom in carrying out when they find the intervention is beneficial to their clients. Also, the have freedom to terminate the innovation which is undesirable for targeted clients.

Implementation of the innovation will try to avoid disturbance towards the routine duty in the designated center. An orientation programme will be provided to the involved nurses and midwives and lactation consultant in the designated centre to introduce the proposed innovation. As the clinic is normally closed during the Saturday afternoon of the short week, the training session can be held by then. Therefore, nurses do not need to be released in official hours and do not affect the manpower to maintain normal function of the services.
Even though manpower and time are needed for the staff to support this breastfeeding intervention, the lactation consultant in the designated center is responsible for monitoring the entire implementation process. 12 well-trained nurses and midwives will be involved in the innovation. Three nurses or midwives will be arranged to perform the individual lactation counseling for 6 breastfeeding mothers per day, and one nurse or midwife is assigned for the telephone follow-up. Nurses and midwives have already trained for breastfeeding counseling technique and individual lactation counseling are part of their routine jobs. So, implementing the programme should not disturb the current staff functions.

The breastfeeding room and interview rooms are available in the centre. Most of the equipment and facilities such as forms and pamphlets are available in MCHC. However, the designated center has to purchase some additional furniture such as breastfeeding chairs and footstools. The availability of the existing equipments and facilities increases the feasibility of the proposed innovation.

3.4 Cost-benefit Ratio of the Innovation

Potential risks to women

There are no known risks for the targeted audience or staff involved in this innovation.

Potential benefits to women
The health benefits of breastfeeding for mothers and infants are widely acknowledged. If the innovation is carried out in MCHC successfully, it relieves the stress of the mothers due to their transition to parenthood and decreases their anxiety due to lack of knowledge in breastfeeding. These health benefits can be achieved by active listening and providing a calm and understanding environment for the mothers and providing them advices to facilitate breastfeeding. Continuous support can strengthen mothers’ self-esteem and capacities to interact and nurture their own infants and may also increase the maternal involvement in breastfeeding (Ekström & Nissen, 2006). It can help the smooth running in MCHC to promote and support the breastfeeding, so as to facilitate the duration of breastfeeding. Therefore, if the innovation is implemented successfully, the breastfeeding clients will gain benefits.

Costs of innovation

It is very important to obtain financial support from the department. For parts of the necessary materials (e.g. private interview rooms and furniture), it is already available in MCHCs. Also, MCHCs also supply written leaflets and videos continuously. Base on a cost-benefit calculation (Appendix H), the materials costs for additional furniture, pamphlets and videos, scarves as souvenirs, brochures and new websites for the innovation is about $23,500.

For non-material costs, the main costs for the interventions are the required
manpower and on-going evaluation and data analysis, and also the needed nursing time for the introduction of the proposed innovation. Comparatively, the non-material cost of implementing the breastfeeding programme includes the staff salary only. The total nurse’s salary including the individual lactation counseling, telephone follow-up, data collection and evaluation is $116,250.

Thus, the proposed programme may have extra benefits for clients of MCHCs. It can decrease their hospitalization rates since there is a reduced risk of infant disease and breastfeeding complications (Leung, Lam, Ho, & Lau, 2005). It is difficult to find evidences suggest significant economic benefits with breastfeeding promotion in Hong Kong. According to the Healthy People 2010 which compared formula-feeding and breast-feeding for each infant enrolled in WIC, breast-feeding saved US $478 in WIC costs and Medicaid expenditures during the first 6 months of the infant's life (Montgomery & Splett, 1997). A detailed table showing the calculation of the total costs, total benefit and the cost to benefit ratio of the innovation is listed in Appendix H.

After assessing the benefits, the risks and the costs of the proposed innovation, the lactation counseling is worth to work in MCHCs.

3.5 Evidence-based Practice Guideline

The conclusion of last sections is clear in which the proposed intervention is
transferable, feasible and reasonably priced in MCHC. An evidence-based practice
guideline will be created based on the findings of previous reviewed studies, in order
to increase duration of breastfeeding by individual professional lactation counseling
and support in the early post-natal period. The guideline should be effective,
supportive and harmless to the target population.

**Title of proposed innovation**

Professional lactation counseling and support for increasing the duration on breastfeeding

**Purpose**

To assist mothers who wish to breastfeed their babies during the early post-natal period.

**Objectives**

1. To support breastfeeding mothers by professional lactation counseling and support
during the early post-natal period.

2. To sustain the duration of breastfeeding.

3. To reduce the risk of breastfeeding complications for breastfeeding mothers.

**Target population**

The target population is mothers who wish to breastfeed and attend the maternal and
child health services at the early post natal periods.
Major Outcomes

Increase in the duration of breastfeeding among breastfeeding mothers during the early post natal periods.

Interventions and Practices

The interventions is the individual lactation counseling and support including face-to-face interviews, follow up in clinic or by telephone calls, written leaflets and videos.

3.6 Recommendations of the Clinical Guideline

The recommendations of the clinical guideline are based on the findings from the eight reviewed papers (Aidam et al., 2005; Bonuck et al., 2005; Henderson et al., 2001; Khresheh et al., 2011; McDonald et al., 2010; Porteous et al., 2000; Su et al., 2007 ; Wallace et al., 2006). Seven recommendations are developed for this guideline and the details are shown in Appendix I. Each recommendation is given a grade based on the assessment using the Grade of Recommendation of the Scottish Intercollegiate Guideline Network (SIGN) (Appendix J).
Chapter 4: Implementation Plan

This chapter illustrates the implementation plan which includes the communication plan, pilot study and evaluation plan. The communication plan works out the identification of stakeholders and the communication process with the potential users. The pilot study is a preliminary trial of the proposed innovation before the full-scale implementation. At last, the evaluation plan evaluates the effectiveness of the proposed innovation in the clinical setting.

4.1 Communication plan

Identification of stakeholders

The relevant stakeholders in the proposed innovation are the service providers and the service users. The service providers include the administrators, lactation professionals such as lactation consultant, midwives, and registered nurses in the MCHC. The service users are mothers attending the services who wish to breastfeed their babies. For the smooth running of the proposed innovation, it is important to communicate with different stakeholders so as to obtain their support of the proposed innovation.

The administrators are in executive and decision-making role in providing the services and are responsible for the budgeting and arrangement of the manpower and
resources. It is important to gain approval from them to implement the proposed innovation. They are the nursing officer-in-charge in the designated MCHC, the regional Senior Nursing Officer (SNO), cluster Senior Medical Officer (SMO) and Principal Medical Officer (PMO) in the head office of Department of Health. Additionally, a breastfeeding working group has already set up since 2009 to improve and support the matters of breastfeeding policy and promotion in the department. The working group consists of senior medical officers, senior nursing officers and lactation consultations.

There are 13 lactation professionals in the designated MCHC (1 lactation consultant, 10 midwives and 2 registered nurses). They are the main service providers that support and implement the innovation. The lactation consultant will take the lead of the implementation of the proposed innovated in the designated MCHC. She is also the trainer of the orientation program for the proposed innovation.

**Communication process**

**Communication with the administrators**

With the new guidelines, the lactation consultant presents the purpose of the innovation to the members of the breastfeeding working group in a formal meeting. They will discuss the need of a change in current practice to structure lactation counseling. The goal will be to help sustain the duration of breastfeeding till 6 months.
It is important to obtain their suggestions and feedback on the improvements of the innovation. The strengths and weakness of the program can be identified through this process. Therefore, the content of proposed innovation can be adjusted according to their valuable opinions.

Then, it is necessary to gain support from the administrators. A series of meetings will be held with the high level administrators and the breastfeeding working group before implementing the innovation. Firstly, the lactation consultant will arrange a meeting with the nursing officer-in-charge in the designated MCHC. The meeting will include the need of change, literature reviews, feasibility of the proposed innovation, and the possible barriers of the implementation. After obtaining support from the nursing-in-charge, she can act as a bridge between the working team and the high level administrators including the senior nursing officers (SNO) and the senior medical officers (SMO).

Secondly, a detail proposal and budget plan include the rationale of change, the transferability, feasibility, potential benefits, risks and cost-benefit ratio and evaluation plan of the intervention will be prepared and submitted to high level administrators before the meeting. The proposed guidelines will be consistent with the philosophy of the breastfeeding policy, which is to improve the duration of breastfeeding and bring benefits to the clients including the breastfeeding mothers and
babies. It will also assure that the existing working functions will not be disrupted and streamline the services through an EBP guideline. With the agreement of nursing and medical staffs in the cluster, the cluster SMO, lactation consultant and the members of working group will persuade the head office Principal Medical Officer to support the proposed innovation. At last, with the approval by the head office in the Department, the necessary budget and arrangement of the manpower and resources will be obtained for implementing the innovation. Also the cluster SMO will liaise with the obstetrics department manager (DOM) in the HA hospital to introduce the innovation to breastfeeding mothers, encouraging them to arrange early visits for obtaining lactation support.

**Communication with the frontline lactation professionals**

After getting approval from the department to implement the innovation, the lactation consultant will design the orientation program and present to the staffs in the designated MCHC. Therefore, the frontline professionals can understand the rationale of the proposed innovation. Their active participation is important to gain a high maintenance of breastfeeding rate to 6 months. Active listening, open discussion and sharing successful cases through the lactation counseling are also welcomed for sustaining the change process. Feedbacks of their feelings and difficulties will be collected through weekly sharing meetings, so as to get support from the frontline
nurses and improve the innovation.

**Communication with the service users**

Brochures and posters with information of health and economic benefits of breastfeeding should be considered and distributed in the designated MCHC. It is to ensure a good communication process with the service users. Comments from the clients will be collected through the suggestion forms that are placed in the waiting area in the designated clinic.

**4.2 Pilot testing**

Pilot study will be carried out before the full implementation of the proposed intervention, in an attempt to test the feasibility of the intervention, gather information to reveal unexpected difficulties and evaluation.

The objectives of the pilot study:

1. To test the feasibility of the innovation in real clinical setting.
2. To assess the lactation counseling skills of the lactation professionals.
3. To test the use of questionnaires among the breastfeeding mothers.

**The time frame of pilot test**

A pilot study will be conducted in the designated MCHC, where the leading lactation consultant works. The expected number of breastfeeding mothers for this
pilot test is 55 and verbal consent will be obtained during the recruitment. Having the 55 cases will ensure all the 13 lactation professionals have adequate cases to practice the counseling intervention. Therefore, each professional performs the lactation counseling to 4 breastfeeding mothers. The MCHC has about 200 newborn infants and mother per month. Approximately 90% of these cases intent to breastfeed, and around 60% of clients meet the inclusion criteria and request for the lactation counseling. The pilot study will last for two weeks. The preparation of the pilot study will last for one month and the remaining one and half month will be used to evaluate and revised the intervention. In total, the pilot test and the preparatory work will take three months.

**Training**

For the preparation of the pilot test, the lactation consultant will act as a trainer to brief the nursing staffs, so as to explain how to implement the guideline in the designated MCHC. The briefing lasts for 45 minutes and will be carried out at the end of the postnatal counseling session during working hours. Every nurse and midwife in the MCHC should undergo the basic departmental training for breastfeeding counseling. Therefore, these 13 health professionals in the designated clinic will have sufficient knowledge to support the breastfeeding mothers.

**Evaluation of the pilot test**
For testing the feasibility of implementing the intervention, the lactation consultant will evaluate whether the work flow is adequate and will not hinder the normal functionality of the designated clinic. The lactation consultant will record the time of the breastfeeding mothers spent with the services and checks whether any unexpected long waiting time. Also they will assess whether the materials (e.g. the breast models and dolls, forms and brochures) are enough for the implementation.

The evaluation includes the competence of counseling technique, time management and the breastfeeding knowledge of the participating staffs. The results of the evaluation can help to maintain the standard of the proposed innovation. After the pilot test, an open discussion will be held for the nursing staffs. The discussion is to allow sharing of their experience, voicing out their encountered difficulties, and to discuss some possible solution for resolving the problems. It is important to get the feedback from nursing staffs to make adjustment of the innovation according to their opinions and feedback.

For the evaluation of the use of questionnaires among the service users, the questionnaires (Appendix L) will be distributed to the breastfeeding mothers after the lactation counseling. Opinions of the breastfeeding mothers (i.e. whether the questionnaires are simple and easy to understand) will be collected.
4.3 Evaluation plan

The evaluation plan is used for data collection. By analyzing the data, it helps to assess the effectiveness and efficiency of the program and subsequently improve the proposed intervention. The evaluation will be started after the data collection (i.e. six months after the intervention is implemented).

Identifying Outcomes

In this plan, there are both the clients and healthcare professional outcomes.

Client outcomes

There are two client outcomes. The short term outcome of the proposed innovation is the level of clients’ satisfaction about the intervention. The long-term outcome is the EBF rates at six month.

The primary outcome is the rate of exclusive breastfeeding at six month after the intervention. The outcome will be collected by asking the breastfeeding mothers about their feeding pattern and their continuity of exclusive breastfeeding during their visit or by phone follow-up. An increase of the EBF rates at six month after the intervention will be expected and compared with the recent study conducted in Hong Kong (Tarrant et al., 2010), so as to evaluate the successfulness of the intervention. The successfulness of the proposed intervention can be determined by comparing the EBF rates at 6 month with a current study. From a current study (Tarrant et al., 2010),...
the rate of exclusive breastfeeding at 6 months is 13.5%. Due to this statistics, the EBF at 6 months of this innovation will be expected to improve by more than 13.5%.

Another outcome is the client satisfaction with the intervention. This outcome will be assessed through a simple questionnaire (Appendix L) which will reflect the effectiveness of the intervention and the performance of the nurses. The questionnaires will be distributed to the breastfeeding mothers after the lactation counseling.

**Healthcare professional outcome**

The healthcare professional outcome measures the levels of satisfaction and confidence in breastfeeding counseling through the self-reported questionnaire (appendix M). The questionnaires should be distributed in the weekly sharing meetings after the intervention process.

**Participants’ eligibility**

Hong Kong mothers who are first-time attenders to the Maternal and Children Health Centre, have discharged from hospital within seven days after her delivery, and wish to breastfeed their infants are eligible to participate in the intervention. The mothers should be Chinese and able to read and write. They should represent the breastfeeding population in Hong Kong.

**Sample size consideration**
For sample size calculation, a free online, Java applets for power and sample size is recommended to study the power of the intervention. Comparing a single proportion to a known proportion with significant level at 5% and Power at 80%, the required sample size is 265 clients. With the estimation of 20% dropout (suggested from the reviewed studies), the total estimated sample size is 320. Around 200 mothers are first-time attenders to the designed clinics. Approximately 90% of these cases intent to breastfeed and around 60% of clients meet the inclusion criteria and request for the lactation counseling. So, 108 clients will be benefited in each month. Therefore, the recruitment period will last for three months for obtaining enough sample for the innovation.

**Measurement**

Interview will be conducted when the mothers have just discharged from hospital and attend the MCHC for newborn care. The infants will be checked for any weight loss and neonatal jaundice. The mothers wish to breastfeed their infants will receive individual lactation counseling by professionals in the single rooms. Afterwards the professionals provide continuing lactation support by telephone calls during the first month after the delivery. The EBF rates are collected at the six month by interview during their follow-up for the injection of the third dose of Hepatitis vaccination in the clinic. A brief telephone interview will be arranged for the
defaulted cases at 6 months checkup. The primary outcome of EBF rates at six month is a yes/no question. Details are in Appendix K.

Level of client satisfaction about the intervention will be measured by a simple and self-administered questionnaire including the attitude and skill of professionals, improvement in the lactation counseling and support for breastfeeding, strengths and weaknesses of the intervention (Appendix L). The questionnaires will be distributed to the breastfeeding mothers before the lactation counseling. They will be asked to complete in the waiting area after the counseling session and putting it into a collection box located near the registration counter.

For healthcare professionals, their satisfaction with the innovation will be measured by the self-reported questionnaire. Their breastfeeding knowledge, arrangement and duration of intervention will be measured and their opinions of any further improvement of the innovation will be collected (Appendix M). The healthcare professionals will be asked to complete the questionnaire at the end the implementation period.

For these two questionnaires, the answers are presented by Likert Scale (1 for strongly disagree, 2 for disagree, 3 for the neutral, 4 for agree, 5 for strongly agree).

**Data Analysis**

Data will be analyzed by using the Statistical Package for the Social Sciences
(SPSS). The goal of the outcome evaluation is to assess the number of exclusive breastfeeding rate at the six month after the intervention. The data will be analyzed and compared by using the Chi -Square test. The rate of EBF at the sixth month is the primary outcome and will be expressed in numbers. Statistical analysis of the client and professional satisfaction are analyzed by using one sample t-test by SPSS. These entire outcomes will be input into the SPSS database.

**Basis of an Effective Change of Practice**

In the discussion of the sample size calculation, the proposed intervention is assumed to be effective and thus the rate of EBF at the sixth month should be improved. In accordance with the previous local study, the EBF rate at the sixth month is 13.5% (Tarrant et al., 2010), and the EBF rate after the proposed intervention will be increased more than 13.5% at the six month.

Clients’ and professionals’ satisfaction are also important for deciding the effectiveness of the innovation. It is considered to be effective if 80% of the clients and professionals choose the “strongly agree” or “agree” on the overall satisfaction level.
Chapter 5: Conclusion

To conclude, evidences from the reviewed studies have shown that individual lactation counseling is feasible and effective in sustaining EBF duration in the early postnatal period. Therefore, it is worth to implement an individual lactation counseling and support in the healthcare setting. An evidence-based guideline of an individual lactation counseling and support is developed and will be successfully implemented through the comprehensive communication plan between the service providers and users. Also, a comprehensive evaluation plan is needed to assess the rate of EBF at the 6th month and the satisfactions of clients and professionals with the programme.
Reference


breastfeeding: Doctors' visits and hospitalizations during the first 18 months of life in Hong Kong Chinese infants. *Epidemiology, 16*(3), 328-335.


Appendix

Appendix A - Keyword Searches History

Electronic databases
PubMed
Ovid Medline
CINAHL Plus,
Cochrane Library

Sets of key words search

Sets of key words
Breastfeeding / breast feeding
AND
Individualized counseling
Positioning and attachment
One-to-one
Professional support

631 articles yielded
PubMed-452 articles
Ovid Medline-66 articles
CINAHL Plus-105 articles
Cochrane Library-8 articles

After screening the abstracts, titles and duplicated copy
463 articles were excluded

168 articles identified
PubMed-127 articles
Ovid Medline-14 articles
CINAHL Plus-26 articles
Cochrane Library-1 articles

After searching for full text
123 articles were excluded

45 articles with Full text

After screening their quality
37 articles were excluded

8 randomized controlled trials identified
<table>
<thead>
<tr>
<th>Study type/Country</th>
<th>Evidence level</th>
<th>Subject Characteristics</th>
<th>Intervention</th>
<th>Comparison</th>
<th>Length of follow</th>
<th>Outcome measures</th>
<th>Effect size</th>
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</thead>
<tbody>
<tr>
<td>1. SU, L., Chong, Y., Chan, Y., Chan, Y., Fok, D., Tun, K., . . . Rauff, M. (2007). Antenatal education and postnatal support strategies for improving rates of exclusive breast feeding; randomised controlled trial. BMJ, 335(7620), 596-612.</td>
<td>RCT Singapore</td>
<td>1(++)</td>
<td>450 women with uncomplicated pregnancies, low household income</td>
<td>Gp2 one session of antenatal breastfeeding by lactation counselor Gp3 Two sessions of postnatal lactation support by lactation consultant at D3 and 1-2 week after delivery</td>
<td>Gp1 Routine obstetric care, including optional antenatal classes, and postnatal visits by a lactation consultant if BF problems arise.</td>
<td>6 months</td>
<td>The rates of EBF by Gp1 Gp2 Gp3 1. 18 20 27 2. 28 27 48 3. 23 36 40 4. 13 24 24 5. 9 19 19 ↑EBF from 2,6,week &amp;3&amp;6 months (p&lt;0.05) The rates of any BF Gp1 Gp2 Gp3 1. 95 96 98 2. 93 95 98 3. 71 73 84 4. 49 58 58 5. 34 43 40 ↑any BF @ 6wk(p&lt;0.05)</td>
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General comment: Most of the women did not attend the optional antenatal classes offered by the hospital
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<tr>
<th>Study type/ Country</th>
<th>Evidence level</th>
<th>Subject Characteristics</th>
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<th>Outcome measures</th>
<th>Effect size</th>
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</table>

| RCT Non blinded USA | 1(+) | 304 women for prenatal care mainly Black and Hispanic | By lactation consultants 2 prenatal meetings, a postpartum hospital visit, and/or home visits and telephone calls | The standard of care in community health center, which included a mandatory prenatal care class, which did not address infant feeding in and detail. | 12 months | Cumulative breastfeeding intensity score at Up to 52 weeks | Intensity Score @ 13 week IG vs CG 61 vs 88 @ 52 week IG vs CG 309 vs 360 Higher scores indicate greater formula feeding, whereas lower scores indicate greater breastfeeding |

General comment: Potential recall bias in maternal self-reports may cause over-reporting breastfeeding
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<th>Study type/Country</th>
<th>Evidence level</th>
<th>Subject Characteristics</th>
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<th>Outcome measures</th>
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<tbody>
<tr>
<td>RCT Ghana</td>
<td>1 (-)</td>
<td>231 pregnant women</td>
<td>Intervention Gp1 IG1 EBF support given pre-, peri-, and postnatal Intervention Gp 2 IG2 EBF support given peri-, and postnatal</td>
<td>Control Gp Non BF health educational support</td>
<td>6 months</td>
<td>The rates of EBF (%)</td>
<td>At 6 month -39.5 in IG1 and IG2 -19.6 in control p=0.02</td>
</tr>
</tbody>
</table>

General comment: the randomization was not a formal one
Hawthorne effect between the research, both increase the selection bias
<table>
<thead>
<tr>
<th>Study type/country</th>
<th>Evidence level</th>
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<th>Outcome measures</th>
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<tbody>
<tr>
<td>RCT South Australia</td>
<td>1 (+)</td>
<td>184 first-time mothers</td>
<td>The educator provide one-to-one standardized education session lasting 30 minutes within the first 24 hours of birth</td>
<td>Usual postpartum BF care provided by hospital midwives (No formal education and assessment of position and attachment)</td>
<td>6 months</td>
<td>Primary: BF rates at 1.6 weeks 2. 3 months 3. 6 months Secondary: Nipple pain &amp; trauma and satisfaction with BF in hospital, at 6 week, 3&amp;6 months</td>
<td>Breastfeeding RR (95% CL) 1. 0.92 p=0.3 2. 0.96 p=0.7 3. 0.88 p=0.3</td>
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General comment: too small sample size to have sufficient power
Not blinding to women and research, cause Hawthorne
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<thead>
<tr>
<th>Study type/country</th>
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<th>Subject Characteristics</th>
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<tr>
<td>RCT England</td>
<td>1. (+)</td>
<td>370 primiparous mothers with term babies, and could sit out of bed</td>
<td>verbal-only advice on positioning and attachment, at 1st postnatal feed, a trained 4-hr long workshop by midwife, one-to-one care</td>
<td>Routine care by a qualified midwife, who was briefing for an hour of BF policy update and the trial.</td>
<td>17 weeks</td>
<td>Primary: the duration of EBF and any BF. Secondary: mothers' experience the type of care delivered and the duration EBF</td>
<td>The ceasing of EBF IG vs CG 6 weeks 76% vs 77% 17 weeks 96% vs 96% P=0.08 The ceasing of any BF IG vs CG 6 weeks 35% vs 32% 17 weeks 63% vs 61% P=0.5</td>
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General comment: the aspects of the intervention were already within routine UK practice
Hand off advice was more important in subsequent feeding

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<thead>
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<th>Study type/country</th>
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<tr>
<td>RCT Canada</td>
<td>1 (+++)</td>
<td>51 women, self-identified as unsupported,</td>
<td>Individualized professional support in form of structured protocol, by midwife, daily in hospital, telephone 72 hrs &amp; weekly, home visit in first week</td>
<td>Conventional nursing care by nurses in the nursing team, no structured protocol for support BF, support by public health hotline after discharge,</td>
<td>4 weeks</td>
<td>The duration of breastfeeding</td>
<td>At 4 week postpartum to continue BF &lt;br&gt; Intervention gp 26/26 (100%) &lt;br&gt; 22 EBF &lt;br&gt; Control group 17/25 (68%) &lt;br&gt; 8 EBF &lt;br&gt; P=0.005</td>
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General comment: small sample size  
↑ cost in providing additional support  

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<th>Study type/country</th>
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<tr>
<td>RCT Southern Jordan</td>
<td>1 (+)</td>
<td>90 primiparous women, young age, not employed low income</td>
<td>One-to-one, postnatal 1- hr educational session, face to face interview &amp; pamphlet with BF information at 2 hour after delivery, follow-up phone at 2 &amp; 4 months</td>
<td>Routine postnatal care and follow-up call at to collect data</td>
<td>6 months</td>
<td>Primary outcomes- 1. The proportion of women fully BF at 6 months (%) 2. women's level of BF knowledge (scores)</td>
<td>1. intervention vs control 39% vs: 27% % difference=12% p&gt;0.05 2. pre vs post: lntervention = 7 vs 10.5 Control = 8.4 vs 8.7 p&gt;0.05</td>
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General comment: the sample size was small to decrease the power  
Hawthorne effect in control group of phone and questionnaires
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<td>RCT Western Australia</td>
<td>1 (+)</td>
<td>849 women, who tended to breast feed,</td>
<td>An extended midwifery support (EMS) program Individual postnatal educational session in hospital and weekly FU home visit with additional telephone contact by midwives</td>
<td>Standard midwifery postnatal care, (SMS) One or more domiciliary visits by hospital-based midwife after discharge before baby D7</td>
<td>6 months</td>
<td>1. The rate of full BF at 6 months (%) 2. The rate of any BF at 6 months (%)</td>
<td>EMS vs SMS 43.3 vs 42.5 (95% CI 0.87-1.19) 63.9 vs 67.9 (95% CI 0.85-1.04)</td>
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General comment: Hawthorne effect in the control group A large loss in home and telephone follow up

# Appendix C - Critical Appraisal Skills Programme (CASP)

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<tr>
<td><strong>Section 1: Internal Validity</strong></td>
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</table>

| **Section 2: Overall Assessment of the Study** |
| 2.1 | How well was the study done to minimize bias? Code ++, +, or – |
### Appendix D - Scottish Intercollegiate Guidelines Network (SIGN) Coding System

<table>
<thead>
<tr>
<th>Level of evidence</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 ++</td>
<td>High quality meta analyses, systematic reviews of RCTs, or RCTs with a very low risk of bias</td>
</tr>
<tr>
<td>1 +</td>
<td>Well conducted meta analyses, systematic reviews of RCTs, or RCTs with a low risk of bias</td>
</tr>
<tr>
<td>1 -</td>
<td>Meta analyses, systematic reviews of RCTs, or RCTs with a high risk of bias</td>
</tr>
<tr>
<td>2 ++</td>
<td>High quality systematic reviews of case-control or cohort or studies</td>
</tr>
<tr>
<td></td>
<td>High quality case-control or cohort studies with a very low risk of confounding, bias, or chance and a high probability that the relationship is causal</td>
</tr>
<tr>
<td>2 +</td>
<td>Well conducted case control or cohort studies with a low risk of confounding, bias, or chance and a moderate probability that the relationship is causal</td>
</tr>
<tr>
<td>2 -</td>
<td>Case control or cohort studies with a high risk of confounding, bias, or chance and a significant risk that the relationship is not causal</td>
</tr>
<tr>
<td>3</td>
<td>Non-analytic studies, e.g. case reports, case series</td>
</tr>
<tr>
<td>4</td>
<td>Expert opinion</td>
</tr>
</tbody>
</table>
### Appendix E - Quality Assessment

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1 Clearly focused question</td>
<td>well covered</td>
<td>well covered</td>
<td>well covered</td>
<td>well covered</td>
<td>well covered</td>
<td>well covered</td>
<td>well covered</td>
<td>well covered</td>
</tr>
<tr>
<td>1.2 Randomization</td>
<td>well covered</td>
<td>well covered</td>
<td>poorly addressed</td>
<td>well covered</td>
<td>well covered</td>
<td>adequately to poorly addressed</td>
<td>well covered</td>
<td></td>
</tr>
<tr>
<td>1.3 Concealment</td>
<td>well covered</td>
<td>well covered</td>
<td>not addressed</td>
<td>well covered</td>
<td>well covered</td>
<td>well covered</td>
<td>adequately addressed</td>
<td>well covered</td>
</tr>
<tr>
<td>1.4 Keep double blindness</td>
<td>not addressed</td>
<td>poorly addressed</td>
<td>poorly addressed</td>
<td>adequately addressed</td>
<td>adequately addressed</td>
<td>adequately addressed</td>
<td>poorly addressed</td>
<td>not addressed</td>
</tr>
<tr>
<td>1.5 Comparison between groups</td>
<td>well covered</td>
<td>well covered</td>
<td>well covered</td>
<td>well covered</td>
<td>well covered</td>
<td>well covered</td>
<td>well covered</td>
<td>well covered</td>
</tr>
<tr>
<td>1.6 Only difference in treatment</td>
<td>well covered</td>
<td>well covered</td>
<td>adequately addressed</td>
<td>well covered</td>
<td>well covered</td>
<td>well covered</td>
<td>well covered</td>
<td>well covered</td>
</tr>
<tr>
<td>1.7 Validity of outcomes measured</td>
<td>well covered</td>
<td>adequately addressed</td>
<td>adequately addressed</td>
<td>well covered</td>
<td>well covered</td>
<td>well covered</td>
<td>well covered</td>
<td>adequately to poorly addressed</td>
</tr>
<tr>
<td>1.8 Drop-out rate</td>
<td>Gp1 17% GP2 19% GP3 20%</td>
<td>IG 17%</td>
<td>Gp1 7% Gp2 11% CG 10%</td>
<td>6 wk 1%</td>
<td>3m 2%</td>
<td>6m IG 6% CG 6%</td>
<td>6 wk 9% 17 wk 8%</td>
<td>2% IG 37.5% CG 33.8% EMS 1.9% SMS 0.9%</td>
</tr>
<tr>
<td>1.9 Intention to treat</td>
<td>well covered</td>
<td>well covered</td>
<td>poorly addressed</td>
<td>not addressed</td>
<td>well covered</td>
<td>not reported</td>
<td>well covered</td>
<td>well covered</td>
</tr>
<tr>
<td>1.10 Comparison for all sites</td>
<td>adequately addressed</td>
<td>not addressed</td>
<td>not addressed</td>
<td>adequately addressed</td>
<td>poorly addressed</td>
<td>well covered</td>
<td>poorly addressed</td>
<td>not addressed</td>
</tr>
</tbody>
</table>

### Section 2: Overall Assessment of the study

| 2.1 Minimize bias | (+) | (+) | (+) | (+) | (+) | (+) | (+) | (+) |

XIV
## Appendix F - Effectiveness of interventions

<table>
<thead>
<tr>
<th>Studies</th>
<th>Intervention</th>
<th>effect size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Su et al., 2007</td>
<td>antenatal education thro video individual lactation support with D3 &amp; 1-2 week home visit hand-on instruction</td>
<td>↑ EBF from 2, 6, week &amp; 3 &amp; 6 mths (\uparrow) any BF @ 6wk (P&lt;0.05) antenatal @ 6 wks, 3 &amp; 6 mths</td>
</tr>
<tr>
<td>Bounck et al., 2005</td>
<td>2 prenatal &amp; postnatal hospital &amp; 8 home visits +/- telephone call hand-on instruction latch on</td>
<td>BF (\geq 50%) significant up to 9 week 45.8% vs 33.1% (P&lt;0.03) AnyBP significant up to 20 wks 53.0% vs 39.3% (p&lt;0.028)</td>
</tr>
<tr>
<td>Aidam et al., 2005</td>
<td>pre-, perinatal, 48 hrs hand-on practice post- home visits</td>
<td>↑ EBF (\uparrow) EBF @ 6m 39.5% vs 19.6%</td>
</tr>
<tr>
<td>Henderson et al., 2001</td>
<td>one-to-one education</td>
<td>no significant on BF less nipple pain (\uparrow) D2 &amp; D3</td>
</tr>
<tr>
<td>Wallace et al., 2006</td>
<td>Hand off, verbal only advice on position and attachment within 24 hours</td>
<td>no significant on BF duration</td>
</tr>
<tr>
<td>Porteous et al., 2000</td>
<td>individual professional support in hospital visit telephone call within 72 hours and weekly home visit @ 1 week</td>
<td>↑ BF 100% vs 68% (\uparrow) @ 4wk</td>
</tr>
<tr>
<td>Khresheh et al., 2011</td>
<td>one-to-one education + telephone @ 2m &amp; 4M</td>
<td>No significant on full BF significant improved the BF knowledge</td>
</tr>
<tr>
<td>McDonald et al., 2008</td>
<td>individual postnatal education + home visits + telephone call till 6 wks</td>
<td>No significant on EBF and any BF</td>
</tr>
</tbody>
</table>
Appendix G-Time frame for monitoring the process

<table>
<thead>
<tr>
<th>Process</th>
<th>Month</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preparation &amp; application for the approval</td>
<td>Jan</td>
</tr>
<tr>
<td>Pilot study</td>
<td>Feb</td>
</tr>
<tr>
<td>Implementation</td>
<td>Mar</td>
</tr>
<tr>
<td>Data collection</td>
<td>Apr</td>
</tr>
<tr>
<td>Evaluation</td>
<td>May</td>
</tr>
</tbody>
</table>
Appendix H- Cost and Benefit

Estimated material and non-material costs of the innovation

Estimated material costs for every 108 clients per month x 3 months = 324 target clients

<table>
<thead>
<tr>
<th>Materials</th>
<th>Details</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pamphlets and leaflets</td>
<td>Extra copies</td>
<td>$1,000</td>
</tr>
<tr>
<td>Videos</td>
<td>Already available</td>
<td>$1,000</td>
</tr>
<tr>
<td>Souvenirs</td>
<td>Scarves for breastfeeding mothers</td>
<td>$3,000</td>
</tr>
<tr>
<td>Brochures</td>
<td>Breastfeeding information booklets</td>
<td>$6,000</td>
</tr>
<tr>
<td>Website</td>
<td>To propaganda the proposed innovation</td>
<td>$10,000</td>
</tr>
<tr>
<td>Furniture</td>
<td>Breastfeeding chairs and footstools</td>
<td>$2,500</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>$23,500</strong></td>
</tr>
</tbody>
</table>

Estimated non-material costs for implementation of 3 month innovation

<table>
<thead>
<tr>
<th>Materials program</th>
<th>Details</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orientation program</td>
<td>Introduction of the intervention</td>
<td>2 hours x 13 nurses = 26 hours</td>
</tr>
<tr>
<td></td>
<td></td>
<td>* $187.5 x 26 = $4,875</td>
</tr>
<tr>
<td>Individual lactation</td>
<td>three nurses or midwives for individual counseling</td>
<td>45 mins x 324 / 60 mins = 243 hours</td>
</tr>
<tr>
<td>counseling</td>
<td></td>
<td>* $187.5 x 243 = $45,562.5</td>
</tr>
<tr>
<td>Telephone follow up</td>
<td>one nurse or midwife for BF telephone follow up</td>
<td>15 mins x 2 x 324 / 60 mins = 162 hours</td>
</tr>
<tr>
<td></td>
<td></td>
<td>* $187.5 x 162 = $30,375</td>
</tr>
<tr>
<td>Data collection</td>
<td>Collecting the duration of BF</td>
<td>5 mins x 4 x 324 / 60 mins = 108 hours</td>
</tr>
<tr>
<td></td>
<td></td>
<td>* $187.5 x 108 = $20,250</td>
</tr>
<tr>
<td>Evaluation of the</td>
<td>Data analysis and entry</td>
<td>15 mins x 324 / 60 mins = 81 hours</td>
</tr>
<tr>
<td>intervention</td>
<td></td>
<td>* $187.5 x 81 = $15,187.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>$116,250</strong></td>
</tr>
</tbody>
</table>

*Mean salary of the 12 nurses or midwives = $33,000 per month

Hourly salary = 33000 / 44 hours x 4 weeks = $187.5 per hour

The total costs for the innovation = $116,250 + $23,500 = $139,750

Benefit (Cost saving)

According to the Hong Kong study, there is about 14% for exclusive breastfeeding mothers for 6 months.

324 x 14% = 45 clients
Compared with formula-feeding and breast-feeding for each infant saved US $478 in WIC costs and Medicaid expenditures during the first 6 months of the infant's life.

US $ 478 x 45 x 7.8 = HK $170,937

Cost to benefit ratio

$ 170,937 / 139,750 = 1.22

The individualized professional lactation counseling and support intervention is cost-effective.
Appendix I - Recommendations of the Clinical Guideline

**Recommendation 1**

The mother who wishes to breastfeed and attends the MCHC after delivery discharged from the hospital within 48 hours should be provided individualized lactation counseling by a qualified health care professional, such as the midwife, nurse or lactation consultant trained in breastfeeding in MCHC during the first visit. (Grade A)

Two sessions of postnatal lactation support by lactation consultant (Su et al., 2007) (1++), individual counseling on positioning and attachment (Wallace, et al., 2006) (1+), individualized professional support (Porteous, et al., 2000) (1++).

Individualized support and follow-up in the early postpartum period considered inclusion of a variety of care providers such as nurses, midwives and lactation consultants to support BF (Porteous, et al., 2000) (1++), (Wallace, et al., 2006) (1++), (Su et al., 2007) (1++), (Bonuck et al., 2005) (1+), (Henderson, et al., 2001) (1+), (Khresheh, et al., 2011) (1+), (McDonald, et al., 2010) (1+), (Aidam, et al., 2005) (1-).

**Recommendation 2**

Nurses should perform a comprehensive breastfeeding assessment of mother and baby during the individual lactation counseling. Key components of the postnatal assessment should be included:

- Observation of positioning, latching, and sucking
- Signs of milk transfer
- Parental ability to identify infant feeding cues
- Mother-infant interaction and maternal response to feeding cues
Maternal perception of infant satisfaction/satiety cues

Maternal breastfeeding self-efficacy

Infant physical assessment (Grade A)

Midwives’ structured protocol with detailed full assessment and skills of attachment (Wallace et al., 2006) (1++)

**Recommendation 3**

Nurses should provide information, emotional and physical education to breastfeeding mothers with an attitude that conveys for breastfeeding. They provide privacy to the BF mothers and enable to describe the process of correct positioning and attachment verbally. Education should include, as a minimum, the following:

- Benefits of breastfeeding
- Lifestyle issues
- Milk production
- Breastfeeding positions
- Latching/milk transfer
- Prevention and management of problems
- Medical interventions
- When to seek help
- Where to get additional information and resources
- Benefits of skin to skin contact
- Recognizing feeding cues (Grade A)

Midwives convey the mother and able to attach the baby herself (Wallace, et al., 2006) (1++), by postnatal lactation support (Su et al., 2007), structured individualized support by a practicing midwife in provision of consistent information and advice (Porteous, et al., 2000) (1++).
The individual lactation counseling should last for about 30 to 60 minutes. (Grade A)

One-to-one standardized education lasts for 30 minutes (Henderson, et al., 2001) (1+), one hour educational session (Khresheh, et al., 2011) (1+).

**Recommendation 5**

It should be best to provide the individualized lactation counseling on between 48 hours to one week. (Grade A)

Lactation support was on D3 and 1-2 weeks (Su, et al., 2007) (1++). Individualized lactation professional support on 72 hours and weekly (Porteous, et al., 2000) (1++).

**Recommendation 6**

Breastfeeding mothers should receive two telephone follow up breastfeeding support intervention. This breastfeeding support can be adjusted depending on the needs of the BF mothers and the clinical decisions by the health professionals. These follow up can be tailor-made for the mothers, will be done by the telephone. (Grade A)

Home visit and telephone follow up arranged after discharge (Porteous, et al., 2000) (1++), (Bounck, et al., 2005) (1+), (McDonald, et al., 2008) (1+). And home visit only (Su, et al., 2007) (1++), (Aidam et al., 2005) (1-). Telephone follow up only (Khresheh et al., 2011) (1+).

**Recommendation 7**

It should evaluate the effectiveness of the breastfeeding intervention and support on duration and exclusivity of breastfeeding on one, two, four and six months after birth during the time for the mothers bring the infants and visit the MCHCs for immunization programme. (Grade A)

Mothers was surveyed to obtain the information regarding the reason for stopping the BF, duration beyond the follow up period and the usefulness of
support at 4 weeks (Porteous, et al., 2000) (1++), by standard questionnaires at 2 and 4 weeks and 3 and 6 months (Su, et al., 2007) (1++), by interview through self-reported at 17 weeks (Wallace et al., 2006) (1++).
Appendix J- Grade of Recommendation of Scottish Intercollegiate Network 2011

<table>
<thead>
<tr>
<th>Grade</th>
<th>Statements</th>
</tr>
</thead>
</table>
| A     | At least one meta-analysis, systematic review, or RCT rated as 1++, and directly applicable to the target population; or  
      | A body of evidence consisting principally of studies rated as 1+, directly applicable to the target population, and demonstrating overall consistency of results |
| B     | A body of evidence including studies rated as 2++, directly applicable to the target population, and demonstrating overall consistency of results; or  
      | Extrapolated evidence from studies rated as 1++ or 1+ |
| C     | A body of evidence including studies rated as 2+, directly applicable to the target population and demonstrating overall consistency of results; or  
      | Extrapolated evidence from studies rated as 2++ |
| D     | Evidence level 3 or 4; or  
      | Extrapolated evidence from studies rated as 2+ |
| Good Practice Point | Recommended best practice based on the clinical experience of the guideline development group |

http://www.sign.ac.uk/guidelines/fulltext/50/annexb.html
Appendix K-Breastfeeding Data Form at Six Month

Infant No: ______________  Date: ___/___/_____

FU method:  □  Clinic visit   □  telephone call

Feeding Pattern:

1. Do you breastfeed exclusively to your baby?   □  Yes   □  No

2. When did you stop exclusive breastfeeding?  ______________

Nurse: _______________
Appendix L - Client Satisfaction Questionnaire

Circle the appropriate answer.

Q1. The length of counseling is adequate.

Q2. The environment provided ensure privacy and comfortable.

Q3. The breast feeding professionals are knowledgeable about breastfeeding.

Q4. The professionals are helpful and supportive.

Q5. The professionals have encouraged me to discuss the problems of breast feeding.

Q6. The counseling helps to resolve my breastfeeding problems.

Q7. The breast feeding pamphlets are informative.

Q8. I will recommend the program to friends who wish to breastfeed.

Q9. Overall, the counseling is satisfactory

Q10. The strength of this program is: ______________________________
     ______________________________
     ______________________________
     ______________________________

Q11. The weakness of this program is: ______________________________
     ______________________________
     ______________________________
     ______________________________

Q12. Any other suggestions: ______________________________________
     _________________________________________________________
     _________________________________________________________
Appendix M - Professional Satisfaction Questionnaire

Circle the appropriate answer

| Q2. The counseling time is enough to support the BF mothers | 1. | 2. | 3. | 4. | 5. |
| Q3. The professionals feel confident in supporting the BF mothers | 1. | 2. | 3. | 4. | 5. |
| Q4. The program can update the BF knowledge for the professionals | 1. | 2. | 3. | 4. | 5. |
| Q5. The breastfeeding data form is simple to use. | 1. | 2. | 3. | 4. | 5. |
| Q6. Overall, the program is satisfactory. | 1. | 2. | 3. | 4. | 5. |
| Q7. The strength of this program is: |  |  |  |  |  |
| Q8. The weakness of this program is: |  |  |  |  |  |
| Q9. Any other suggestions: |  |  |  |  |  |