Breast milk provides the best source of nutrition to infants and young children. To achieve effective breastfeeding, initiation of breastfeeding is important. World Health Organization suggests that breastfeeding should be started within the first thirty minutes after delivery. However, it is difficult to carry out in Hong Kong due to the separation of mothers and infants shortly after birth. This hinders the success of breastfeeding. Kangaroo mother care (KMC), putting naked infants on the mother’s chest immediately after birth, is a new practice in Hong Kong. It is a simple, safe and useful practice for healthy full term infants and mothers in the hospitals. The reviewed
studies show that KMC is effective in breastfeeding initiation among full term infants. The implementation potential including the transferability of the findings, feasibility and the cost-benefit ratio of the proposed KMC program is discussed. Evidence based practice guidelines of KMC for full term infants are developed in the proposed intervention. In order to implement the new guidelines effectively, an implementation plan including the communication plan and a pilot study will be carried out within a time frame. The KMC program will be evaluated for its effectiveness in breastfeeding initiation as the primary outcome. Secondary outcomes such as satisfaction level toward KMC practice among term delivery mothers and nurses, and the cost of running the KMC program will also be evaluated. It is expected that KMC will be beneficial to infants, mothers, nurses and the hospital.
Effectiveness of kangaroo-mother care on breastfeeding initiation for term delivery mothers

by

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A dissertation submitted in partial fulfillment of the requirements for the degree of Master of Nursing at the University of Hong Kong

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Declaration

I declare that this dissertation represents my own work, except where due acknowledgement is made, and that 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 ______________________________

TAM YUK TING
Acknowledgements

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Chapter 1: Statement of the problem

Introduction

Breastfeeding is a natural and ideal infant feeding method. It provides the best source of nutrition to infants and young children. Breast milk contains antibodies which protects infants from common childhood diseases like diarrhea and pneumonia and reduces child mortality (World Health Organization, 2014). Exclusive breastfeeding under six months is recommended by World Health Organization (World Health Organization, 2014). Kangaroo-mother care (KMC), the naked baby is put prone on the mother’s bare chest with skin-to-skin contact at birth or soon afterwards, is an effective method to help mother-infant bonding, breastfeeding and keep infant warm as well as protect infant from stimulation and infection (World Health Organization, 2014). This paper aims to study the effectiveness of KMC on breastfeeding initiation for term delivery mothers before hospital discharge and to develop evidence-based guidelines for the implementation of KMC in the obstetric unit of a local hospital.

Background

Breastfeeding is promoted globally. In 1991, the Baby Friendly Hospital Initiative (BFHI) was promoted by WHO and the United Nations Children’s fund (UNICEF) to encourage maternity units to promote, protect and support breastfeeding (Baby Friendly Hospital Initiative Hong Kong Association, 2014). However, the current
practice in Hong Kong has room for improvement. After the infant is born, the infant is dried and put under the radiant warmer immediately after cutting the umbilical cord for physical examination, vitamin K injection, measuring head circumference, body weight and body height. Then, a blanket is used to wrap the infant and back to mother after the episiotomy wound is repaired. The mother and infant are transferred to postnatal ward. Nurses of postnatal ward identify the name and sex of the infant and do the infant bath. Mother can decide to practice KMC or not after the nursing care is done. If KMC is not preferred, the infant is either put into a cot near to the bed of mother or put into an incubator for those with unstable body temperature which is not near to the bed of mother. From a survey conducted by the Baby Friendly Hospital Initiative Hong Kong Association (Baby Friendly Hospital Initiative Hong Kong Association, 2014), the breastfeeding rates on discharge among hospitals in Hong Kong were 84.2 percent in 2013 and 85.8 percent in 2012. Only 24.3 percent of babies received exclusive breastfeeding in hospital in 2013. Moreover, regarding to the initiation of breastfeeding, only 22 percent of babies were breastfed within one hour of birth in 2013. There were only two hospitals among eighteen hospitals under Hospital Authority in Hong Kong practiced KMC more than one hour within five minutes after normal spontaneous delivery and Caesarian section deliveries without general anesthesia. From hospitals which had responded, 43 percent of mothers were
able to practice KMC with babies and among them, only 28 percent of mothers could enjoy KMC over an hour in 2013 (Baby Friendly Hospital Initiative Hong Kong Association, 2014).

Affirming the needs

Breastfeeding is beneficial not only to the baby, but also to the mother, society and environment. For the baby, breastfeeding can boost the immune system of baby due to the immune protective matters in the breast milk (Baby Friendly Hospital Initiative Hong Kong Association, 2014). Babies are less prone to diseases such as necrotizing enterocolitis, pneumonia, otitis media, eczema, asthma, diabetes and sudden infant death syndrome (Baby Friendly Hospital Initiative Hong Kong Association, 2014). With the components of essential fatty acids, DHA and AA, breastfeeding also promotes a baby’s growth (Baby Friendly Hospital Initiative Hong Kong Association, 2014). Babies who are breastfed are less likely to be obese because they regulate the right amount of milk intake by themselves (Baby Friendly Hospital Initiative Hong Kong Association, 2014). The psychological and physical health of mothers can be improved by breastfeeding (Baby Friendly Hospital Initiative Hong Kong Association, 2014). For physical health, uterus contraction can be stimulated by early breastfeeding which promotes recovery from delivery (Baby Friendly Hospital Initiative Hong Kong Association, 2014). It reduces the occurrence of breast cancer, ovary cancer
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For psychological health, breastfeeding strengthens bonding between mother and infant which stabilizes maternal emotion (Baby Friendly Hospital Initiative Hong Kong Association, 2014). Furthermore, for the society aspect, breastfeeding improves health of mothers and infants which reduces public medical costs (Baby Friendly Hospital Initiative Hong Kong Association, 2014). Lastly, for the environment aspect, breastfeeding is the most environmental friendly method of infant feeding as it does not use extra energy and produce any wastes (Baby Friendly Hospital Initiative Hong Kong Association, 2014).

WHO recommends that exclusive breastfeeding should be continued up to six months of age (World Health Organization, 2014). With the benefits brought by breastfeeding, Baby Friendly Hospital is promoted globally. The WHO and UNICEF promotes Baby Friendly Hospital Initiative to provide an environment to support breastfeeding as a norm for all babies (Baby Friendly Hospital Initiative Hong Kong Association, 2014).

The trend of breastfeeding in Hong Kong is increasing. It rose from 19 percent in 1992 to 84.2 percent in 2013 on discharge (Baby Friendly Hospital Initiative Hong Kong Association, 2014). However, there were only three local hospitals in Hong Kong which reached the process of “registration of intent” in 2013, and only one of them reached the process of “certificate of commitment”. The pace of developing
Baby Friendly Hospital in Hong Kong requires improvement. It is important to develop strategies to promote breastfeeding in Hong Kong.

The first two hours after birth is very sensitive to infants to start breastfeeding. They respond to maternal cues like tactile, thermal, odor stimulation. They start breastfeeding behaviors such as rooting and suckling. Applying KMC was effective to the success of initiating breastfeeding (Moore & Anderson, 2007).

Kangaroo-mother care (KMC) was developed in Colombia in 1978 because at that time, incubators were not enough for preterm infants (Ramanathan, Paul, Deorari, Taneja & George, 2001). However, with the benefits brought, KMC can be carried out in any setting, even in developed countries with advanced medical technology and sufficient manpower (World Health Organization, 2003).

However, KMC is a new concept to mothers in Hong Kong. In the past decades, with insufficient manpower in the hospital, the focus on infant care could only be focused on the conventional care in which newborns had been kept separate and distant from mothers either in incubators or cots since birth. Mother touched baby only when changing diaper or feeding. It hindered the success of breastfeeding because mothers were less sensitive to infants’ cues and unique characteristics (Mok & Leung, 2006).

Also, mothers felt anxious, isolated and helpless (Mok & Leung, 2006). Breast milk synthesis and ejection are affected by two hormones, prolactin and oxytocin.
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(Heidarzadeh et al., 2013). Maternal emotion affects the level of these hormones. The separation between mother and infant not only affects mothers’ mental health and their ability to take care of the babies but also affects the breast milk production badly (Heidarzadeh et al., 2013). This may subsequently increase the re-admission rate of the infants and interfere with the parent-child relationship (Baby Friendly Hospital Initiative Hong Kong Association, 2014).

Objectives and question

Breast milk brings the best nutrients to an infant in the first six months of life. As breastfeeding brings numerous benefits to different parties such as infants, mothers, society and environment (Baby Friendly Hospital Initiative Hong Kong Association, 2014), promotion of breastfeeding should be made comprehensively and effectively. Early initiation of breastfeeding means providing maternal breast milk to infant within one hour of birth (World Health Organization, 2003). Colostrum is the first milk that the infant receives. It is important to the infant because it has a lot of antibodies, anti-infective proteins and white blood cells than mature milk. It develops a newborn’s first immunization against the surrounding micro-organisms (World Health Organization, 2014). It also contains growth factors. All these protect the baby from infections, having allergies and intolerance to other foods (Baby Friendly Hospital
Therefore, early initiation of breastfeeding is encouraged. KMC is useful to meet an infant’s needs for breastfeeding, warmth, bonding with mother, safety, protection from illness and stimulation (Baby Friendly Hospital Initiative Hong Kong Association, 2014). The objectives of the review are to investigate the effectiveness of KMC in promoting breastfeeding initiation for term delivery mothers and to develop evidence-based guidelines for the implementation of KMC in the obstetric unit of a local hospital.

To facilitate KMC in relation to mothers and term infants in obstetric unit, the research question is: Is KMC more effective in promoting breastfeeding initiation for term delivery mother comparing with conventional care? In between, the question contains the PICO components, P: Term delivery mother, I: KMC, C: Conventional care, O: Breastfeeding initiation.

Significance of problem

There was a joint WHO and UNICEF statement in 1989 about “the ten steps to successful breastfeeding” (United Nations Children’s fund, 2014). One of the steps is to assist mothers to begin breastfeeding within a half-hour of birth. KMC is found to be useful in both bonding and breastfeeding because it stimulates the secretion of prolactin and oxytocin which help in breast milk production and ejection of milk.
respectively (Heidarzadeh et al., 2013). KMC facilitates lengthened duration of breastfeeding (Khadirovzadeh et al., 2009) and maternal satisfaction on breastfeeding (Srivastava et al., 2014) as well as exclusive breastfeeding upon discharge (Heidarzadeh et al., 2013). KMC is found to be effective to increase mother’s confidence to care her baby and lessen maternal anxiety level after giving birth (DiMenna, 2006). For the benefits of infant, KMC helps to regulate infant’s body temperature and stabilize heart rate, respiratory rate, oxygen saturation. With a better sleep, baby gains weight better and can be discharged earlier (Moore, Anderson, Bergman & Dowswell, 2007). For the aspect of hospital, KMC improves the quality of care for baby and mother and achieves client’s satisfaction. The health care costs can be reduced as the need of incubator is decreased and also, baby under KMC acquires less infection from the hospital, baby can be discharged home earlier (Kirsten, Bergman & Hann, 2001).

Chapter 2: Review of evidence

Study selection criteria: Keywords and search strategies

Breastfeeding is beneficial to all infants and KMC is an easy, inexpensive, effective and safe practice for both mothers and infants. This section is about the literature review of published research studies of KMC compared with conventional care on
breastfeeding initiation. An analysis about the effectiveness of KMC on breastfeeding initiation was made and a discussion of the implication of KMC for practice was made at the end.

**Study selection criteria: search strategies**

**Inclusion criteria**

- Primary studies on KMC or skin to skin contact for term infants in hospitals.
- Written in English.

**Type of studies**

- Randomized Controlled Trials (RCTs).

**Type of participants**

Term infants:  
- more than 37 weeks of gestational age  
- stable condition not requiring resuscitation at birth nor continuous medical support.

Mothers:  
- healthy  
- undergoing normal vaginal delivery.

**Type of nursing intervention approach**

- KMC between term infants and mothers

**Type of outcome measures**

- Success of first breastfeeding
- The time of first breastfeeding initiation

*Exclusion criteria*

- Multiple pregnancy such as twins or triplet pregnancy.
- Not primary studies
- Not human studies

**Search strategies**

The electronic published literatures were searched through search databases including MEDLINE, PubMed. The keywords of searching were “kangaroo mother care”, “kangaroo care”, “skin to skin contact” or “skin to skin care” in combination with “breastfeeding initiation”, “breastfeeding” or “first breastfeeding”.

In PubMed, there were 487 journals searched initially. 74 potential journals were remained after choosing RCT. These journals were then screened by choosing free full text, within ten years of publication, relating to human and written in English. After the screening, only 11 studies passed. By reading the titles and abstracts of the 11 studies as well as considering the inclusion criteria, four studies were found to be relevant and selected finally. In MEDLINE, there were 613 studies found initially. 46 potential studies were left after screening by RCT. These journals were then screened by choosing English language, relating to human and within ten years of publication.
22 studies passed. By reading the titles and abstracts of the 22 studies as well as considering the inclusion criteria, four studies were found to be relevant and selected finally. These four studies were duplicated with those found in PubMed. By searching the reference lists of the relevant studies, one more primary study was found. Finally, there were five RCTs studies in this literature review. Figure 1 shows the search process. Appendix L shows the PRISMA 2009 flow diagram of searching systematic review and meta-analysis.
Figure 1: Flow chart of search strategies and results

Database: PubMed

487 potential studies

74 studies were screened

413 studies were excluded. Reason: not RCT

11 studies were assessed according to the inclusion criteria, title and abstract

63 studies were excluded. Reason: >10 years of publication, not human study, not in English

Manual searches from the reference lists of the studies

4 RCTs studies selected for review (Duplicate with MEDLINE)

1 primary study selected for review

5 Randomized Controlled Trials

Database: MEDLINE

613 potential studies

567 studies were excluded. Reason: not RCT

46 studies were screened

24 studies were excluded. Reason: >10 years of publication, not human study, not in English

22 studies were assessed according to the inclusion criteria, title and abstract

4 RCTs studies selected for review (Duplicate with PubMed)
Results

See Table 1: Tables of evidence

Method of data extraction

The details of the five RCTs studies were presented systematically in Table 1. Table 1 is the Table of Evidence for Intervention Studies developed by the Scottish Intercollegiate Guidelines Network (SIGN) (Scottish Intercollegiate Guidelines Network, 2014).

Description of research studies

All selected studies (n=5) were conducted to investigate the effects of KMC and conventional method care (CMC) between mothers and term infants on breastfeeding initiation and first breastfeeding time in different countries. Four studies were carried out in developing countries like Iran, Pakistan and India (Aghdas et al., 2013; Mahmood et al., 2011; Srivastava et al., 2014; Khadivzadeh et al., 2009) and one study was studied in the United States (Moore et al., 2007). Among the studies, written consents were obtained from the samples. All mother samples were healthy, eighteen years old or above, undergoing spontaneous vaginal delivery (Aghdas et al., 2013; Mahmood et al., 2011; Moore et al., 2007; Srivastava et al., 2014; Khadivzadeh et al., 2009). All infant samples were term and without
medical problems (Aghdas et al., 2013; Mahmood et al., 2011; Moore et al., 2007; Srivastava et al., 2014; Khadivzadeh et al., 2009. All the samples were randomized into either KMC group or CMC group. The samples were recruited from hospitals (n=3) (Aghdas et al., 2013; Srivastava et al., 2014; Khadivzadeh et al., 2009) and medical centres (n=2) (Mahmood et al., 2011; Moore et al., 2007). The sample size of these studies was in small-scale with 20 to 240 participants. The intervention of KMC was conducted for at least two hours post birth for all studies (n=5) (Aghdas et al., 2013; Mahmood et al., 2011; Srivastava et al., 2014; Khadivzadeh et al., 2009; Moore et al., 2007). Regarding to the outcome measures, success in breastfeeding initiation by using Infant Breastfeeding Assessment Tool (IBFAT) (n=5) (Aghdas et al., 2013; Mahmood et al., 2011; Srivastava et al., 2014; Khadivzadeh et al., 2009; Moore et al., 2007), first breastfeeding initiation time (n=2) (Mahmood et al., 2011; Khadivzadeh et al., 2009) and breastfeeding rate during the first 30 minutes post birth (n=1) (Khadivzadeh et al., 2009) were mentioned. Other outcome measures such as maternal breastfeeding self-efficacy, maternal satisfaction, breastfeeding status, body weight loss of infants, infant morbidity, infant’s axillary temperature and problems of breastfeeding were also mentioned in these studies but they were not related to the objective of this literature review about the breastfeeding initiation.
Among the studies, two studies were funded by university of medical science research funds (Khadivzadeh et al., 2009; Moore et al., 2007). However, the sources of funding of the research study were not reported from three studies (Aghdas et al., 2013; Mahmood et al., 2011; Srivastava et al., 2014)

**Quality assessment**

The quality assessment of the selected studies was made by the SIGN 50- A guideline developer’s handbook (Scottish Intercollegiate Guidelines Network, 2014). Appendix A shows the methodology checklist for Randomized Controlled Trials. Table 2 was the quality assessment table about the internal validity for the five RCTs studies. Table 3 showed the overall assessment of the studies.

From the quality assessment, three studies were in high quality and two studies were in fair quality. For the strengths, all studies were RCTs. All these studies addressed appropriate and clearly focused question on effectiveness of KMC on the breastfeeding initiation among term infants (n=5). The assignments of KMC or CMC group were randomized in all studies (n=5). Computerized allocation systems and sealed coded envelopes were used to ensure a good concealment (n=5). The subjects and investigators were kept blind about treatment allocation in four studies (n=4) (Aghdas et al., 2013; Srivastava et al., 2014; Khadivzadeh et al., 2009;
Moore et al., 2007). One study was conducted in developed country, USA (n=1) (Moore et al., 2007). In all studies, the intervention and control groups were similar at the beginning (n=5). The only difference between them was the practice of KMC or CMC (n=5). Finally, valid and reliable measurement was used to measure the outcomes (n=5). Infant Breastfeeding Assessment Tool (IBFAT) was used (See Appendix B). IBFAT consists of four items about infant breastfeeding behaviour including readiness to feed, rooting, fixing and sucking pattern. The highest score for each item is 3 and the lowest score is 0. The maximum score is 12. With a higher score, it represents the infant is having a successful breastfeeding. The tool was developed from literature review, clinical practice observations and consultations from neonatal behaviour experts. The interrater reliability was 91 percent from mothers and researchers (Hill & Johnson, 2007).

For the weakness, the mothers and research assistants were informed of the intervention of KMC or conventional care after randomization in one study (n=1) (Mahmood et al., 2011) which might increase the probability of bias. Populations of four studies were from ethnic groups of developing countries such as Iran, India and Pakistan (n=4) (Aghdas et al., 2013; Mahmood et al., 2011; Srivastava et al., 2014; Khadivzadeh et al., 2009) while one study was focused in Caucasian mothers (n=1) (Moore et al., 2007). As the target population of this review is Chinese,
cultural characteristics are needed to be considered. Moreover, the dropout rates were significant ranging from 13 percent to 19.5 percent in four studies (n=4) (Aghdas et al., 2013; Mahmood et al., 2011; Srivastava et al., 2014; Moore et al., 2007). Bias might be found in one study because both primiparous mothers and mothers who had given birth previously were included. Mothers who had given birth previously might have breastfeeding experience which affected the results (n=1) (Mahmood et al., 2011). Also, a small sample size of 20 subjects was recruited in one study (n=1) (Moore et al., 2007).

Summary and synthesis

KMC is an easy, safe and efficient practice for mothers giving birth to term babies. KMC was implemented in the research studies and its characteristics were summarized.

Arrangements for KMC:

Naked infants except with a cap and a nappy were placed prone against mothers’ skin between breasts with a warm blanket covered. In two studies, weighing, vitamin K injection were postponed after two hours of KMC practice (Aghdas et al., 2013; Khadivzadeh et al., 2009). One study measured infants’ birth weight and declared sex
identity within 30 minutes of birth before KMC started (Srivastava et al., 2014). One study did physical examination and vitamin K injection before starting KMC (Moore et al., 2007). In one study, the time of when to perform physical examination was not mentioned (Mahmood et al., 2011).

*When to start KMC:*

Three studies practiced KMC immediately after birth (Aghdas et al., 2013; Mahmood et al., 2011; Khadivzadeh et al., 2009). One study practiced KMC within 30 minutes of birth with weighing and declaration of sex done beforehand (Srivastava et al., 2014). One study practiced KMC after physical examination and vitamin K injection were done (Moore et al., 2007).

*Duration of KMC:*

Four studies practiced KMC for at least two hours starting from birth (Aghdas et al., 2013; Srivastava et al., 2014; Khadivzadeh et al., 2009; Moore et al., 2007). One study practiced KMC until the first feed taken for at least 45 minutes had passed or at least for two hours when the infant did not take feed (Mahmood et al., 2011).

*Effectiveness of KMC*
After reviewing the selected studies, the effectiveness of KMC on breastfeeding initiation among term infants were studied and presented in the tables of evidence (Table 1). All studies showed that KMC was effective in the success of first breastfeeding by using the IBFAT. The time to begin first breastfeeding was shorter than conventional care (n=2) (Mahmood et al., 2011; Khadivzadeh et al., 2009). Moreover, the breastfeeding rate during the first 30 minutes after birth was higher than conventional care (n=1) (Khadivzadeh et al., 2009).

Implications for practice

KMC is a safe, inexpensive, non-invasive and convenient practice for both mothers and term infants because mother can feel, know and respond to the cues from the baby when placing the baby skin-to-skin onto her breasts with a blanket covered.

From the literature review, it showed that KMC benefits all infants as it helps in early breastfeeding initiation. With the evidence based research results, it is important to implement KMC practice for all term infants soon after birth. Early separation between mothers and infants should be discouraged. To facilitate the baby-friendly hospital initiative announced by WHO and UNICEF, more RCT researches are needed to help in setting up evidence based KMC guidelines in Hong Kong. Local hospitals are in essential roles to encourage the practice and more training of KMC should be
provided to healthcare professionals so that they can be equipped with professional knowledge and skills to support the practice as well as mothers and infants. For those hospitals practicing KMC, the experience of KMC practice should be exchanged between hospitals so that the current practice can be modified and unified.

**Chapter 3: Implementation Potential**

From the literature review, kangaroo-mother care (KMC) was found to be effective in the promotion of breastfeeding initiation for term delivery mothers in the delivery suite. In this section, an implementation potential about the proposal of KMC practice in a local hospital is discussed. Besides, the transferability, feasibility and the cost-benefit ratio of the innovation are mentioned.

**Target audience and setting**

**Setting**

The nursing intervention is taken place in the delivery suite in one of the hospitals in Hong Kong. This hospital is managed by the Hospital Authority with hundred years of history serving clients in Kowloon West cluster and Wong Tai Sin. There are twelve beds in the delivery suite with fifty midwives.
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The target audiences in this nursing intervention are Chinese mothers aged above eighteen, primiparous with normal vaginal delivery in healthy condition which is defined as not having medical complications such as gestational diabetes mellitus, pregnancy induced hypertension, severe postpartum haemorrhage or breast diseases and their babies who are in full term with healthy condition which is defined as having APGAR score above seven marks at five minutes after birth, without resuscitation after birth and without congenital abnormalities nor severe medical problems.

In Hong Kong, KMC is a new concept to both mothers and nurses. The first two hours after birth is a sensitive period for newborns to initiate breastfeeding. Maternal cues such as tactile, thermal and odor stimulation can stimulate newborns to start breastfeeding behaviors like rooting and suckling (Moore & Andrson, 2007). From the literature review, KMC after birth is found to be effective in the success of the breastfeeding initiation. To effectively promote breastfeeding in Hong Kong, the implementation of KMC for mothers and infants is proposed.

Transferability of the findings

*Fitness of the innovation in the proposed setting*
The settings in the literature review were delivery suite in either hospitals or medical centres in Iran, Pakistan, India and the United States, similar to the setting of the proposed study of KMC to be carried out in the delivery suite in one of the hospitals in Hong Kong.

*Similarity between target population and participants in research*

The study groups in the literature review were Caucasian mothers in Western countries and African Americans mothers in developing countries. In the proposed program, Chinese mothers with their babies in Hong Kong are recruited. Although the race between the reviewed studies and the proposed study are different, breastfeeding is a natural act of newborns with their inborn rooting and sucking reflexes regardless of race (World Health Organization, 2014). Therefore, race will not be a factor affecting the result of breastfeeding initiation brought by KMC.

For the populations between the studies and the proposed setting, mothers are aged above eighteen with normal vaginal delivery and they are in healthy condition without medical complications such as gestational diabetes mellitus, pregnancy induced hypertension, severe postpartum haemorrhage or breast diseases. The babies are in full term (above 37 weeks of gestational age) and in healthy condition with APGAR score above seven marks at five minutes after birth, without congenital abnormalities,
severe medical problems nor require resuscitation after birth. Since the target population between the reviewed studies and the proposed study are similar, the findings of the reviewed studies can be transferred to the proposed study. It is possible to carry out KMC in the delivery suite for mothers and newborns.

Philosophy of care

The Hospital Authority follows the recommendation from WHO that exclusive breastfeeding should be promoted (World Health Organization, 2014). Nurses in obstetric units actively deliver the message of breastfeeding to mothers in different ways such as health educational talk, counselling and the educational materials. The trend of breastfeeding in Hong Kong is improving (Baby Friendly Hospital Initiative Hong Kong Association, 2014). However, the pace of development of baby friendly hospital has room for improvement. The implementation of KMC for healthy mothers and babies in the delivery suite in Hong Kong is proposed to improve the breastfeeding status in Hong Kong.

Sufficient number of clients

From the statistical report of Hospital Authority, there were 43,249 live births born in 2012. Among the live births, 6,037 of them were born in the proposed hospital
(Hospital Authority, 2013). If the nursing intervention of KMC can be carried out in the proposed setting, it is expected that over six thousands of mothers and babies will be benefited from the advantages of breastfeeding per year.

Time for the innovation

For the proposed intervention, it is expected that one year of time is required. During the year, one month is needed for the preparation such as staff training, purchase of equipments, setting up evidence-based guidelines and getting approval from Chief of Service (COS) and Department Operating Manager (DOM). One month is needed for the pilot study and evaluation to carry out. Within the one month of pilot study, modification of the guidelines will be done. After the final protocol of KMC is established, there are ten months for the innovation to be implemented in the delivery suite.

Feasibility

Freedom to carry out or terminate the innovation

The program manager will introduce the proposed innovation and outline the budget to the COS, DOM and WM to get the approval. When they approve the implementation of the program, the program manager can start the preparation of
KMC program with her committee members. When the mothers admit to the delivery suite, nurses will introduce the KMC program to them and ask for written consent. After getting the consent from mothers, the trained nurses can carry out the proposed innovation according to the protocols. If the target population is not favorable to the innovation, for example, deterioration of health condition, for example, mothers with severe postpartum haemorrhage, seizure or babies with respiratory distress or hypothermia, trained nurses can terminate the program.

**Before the implementation of the innovation and skills required**

In the proposed program, a KMC committee composed of one program manager, three team leaders and five representative staff will be established. The five representative staff are the representative among the forty five frontline nurses. The program manager (Lactation consultant) will be the coordinator of the program. After getting the approval from the COS, DOM and WM, the program manager will recruit three team leaders (Advanced Practice Nurse) and introduce the evidence-based guidelines about KMC to them in a two-hour conference. The program manager will provide a six-hour training course for the team leaders and all of the frontline staff members including the five representative staff (45 Registered Nurses). The training course will be conducted in a big group class into two sessions, three hours in one
morning session and three hours in one afternoon session, Guidelines of KMC, practical skills, problem solving skills, counselling skills will be included in the training course. All staff are expected to possess the skills taught in training course. The team leaders will give additional lessons for the team members if needed. The team leaders will have meeting to discuss about the preparation of the practice. They will guide and collect the feedbacks as well as tackle challenges met by team members. Team leaders and the five representative staff will have meetings every week to discuss about the program’s effectiveness and its challenges. Regular meetings will be made every two weeks between program manager and team leaders so that the team leaders can report the progress of the program and they can discuss about the modification of the guidelines.

Support from staff

Nurses may not be supportive to the proposed program. They may think that it will increase their workload because nurses need to teach mothers about the KMC skills and the observational skills about the baby’s physical conditions as well as counsel the mothers to practice KMC. Also, nurses need to observe the breastfeeding behavior of the baby to collect data for the program to see the efficacy of KMC on breastfeeding initiation. However, the potential worries between nurses can be
relieved as pamphlets and video tapes about KMC produced by the three team leaders will be given to mothers after admission to the labor ward. Mothers will have a brief and clear idea about what KMC is, its benefits and skills and the observational skills they need to pay attention. Then, frontline nurses will educate the mothers and run the KMC program smoothly.

Support from administration

The proposed program will gain the support from the administrators because the program is cost effective by saving HK$17580860 annually compared with the current practice. If the program of KMC is found to be effective in breastfeeding initiation, it helps the promotion of development of a baby-friendly hospital in Hong Kong.

Consensus among staff and administrators

In order to implement the proposed program smoothly, comments from the administrators and frontline nurses will be taken into consideration to reach consensus. Protocols and guidelines are made and modified with evidence based and with the agreement of the committee members. A one-month pilot study will be implemented to test the practice and to see if any difficulties encountered.
Friction within the organization

The KMC program will be taken place in the delivery suite in the obstetric unit in the proposal. However, mothers experiencing KMC in the delivery suite may prefer continuing to practice KMC in the postnatal ward. As KMC service is not available in the postnatal ward, friction may be caused to the postnatal ward staff. To relieve the pressure brought to postnatal ward, clear instruction will be given to mothers that KMC service is only available in delivery suite. However, if KMC is found to be feasible to be carried out in delivery suite, and the findings of the proposed study are shown to be successful in promoting breastfeeding initiation, a joint conference will be held between the delivery suite and the postnatal unit to discuss and share the KMC practice. As a result, KMC practice is not restricted to one unit only, mothers, babies, nurses and the hospital can enjoy the benefits brought by the practice during the hospitalization.

Equipment and facilities

During the KMC practice, a blanket is required to cover the baby placed on the mother’s breasts. Thermometer, pulse oximeter and cardiorespiratory monitor are used to monitor the baby’s physical conditions. Other equipment such as stationery, paper,
ink for the photocopy, video tapes are needed for the teaching material of pamphlets.

Meetings between the program team can be taken place in the conference room in the obstetric department.

Measuring tools for evaluation

For the evaluation, it can be divided into process evaluation and outcome evaluation respectively. In process evaluation, regular meetings will be arranged every week held by the program leader and the team members. During the meeting, nurses can give feedbacks about the program and the difficulties encountered by them and the mothers. Adjustment and modification of the protocols will be made after reaching consensus among program leader and team members. Also, the program manager will meet the team leaders every two weeks to discuss the progress of program and to discuss the modified protocols for approval. For the outcome evaluation, the effectiveness of KMC on breastfeeding initiation can be measured by using the Infant Breastfeeding Assessment Tool (IBFAT).

Cost/Benefit ratio of the innovation

Risks to clients

When the innovation is proposed, worries about potential risks such as hypothermia
and hypoxia of newborns arise from nurses and mothers. However, studies showed that KMC will improve the physical conditions of the newborns. Newborns with KMC will have stable body temperature, heart rate and breathing rate as well as higher oxygen saturation (Bergman, Linley & Fawcus, 2014; Kadam, Binoy, Kanbur, Mondkar & Fenandez, 2005). To ease the worries of nurses and mothers, the conditions of the baby will be closely monitored, for example, taking body temperature, observing breathing pattern, measuring the oxygen saturation, heart rate and counselling services will be provided if needed.

_Potential benefits_

From the review, KMC is found to be effective in the breastfeeding initiation (Aghdas et al., 2013; Srivastava et al., 2014; Khadivzadeh et al., 2009; Mahmood et al., 2011; Moore et al., 2007). Breastfeeding helps a baby’s growth and protects the baby from infections (World Health Organization, 2014). KMC also helps newborns’ bonding with mothers (Baby Friendly Hospital Initiative Hong Kong Association, 2014). For nurses, brought by the benefits of breastfeeding, baby has a shorter stay in hospital (Conde-Agudelo & Diaz-Rossello, 2014). It reduces the workload of nurses in a long run. Moreover, as KMC is educated by nurses and nurses can decide to carry out KMC by the fitness of mothers and babies. With a better autonomy, it helps nursing
professionalization (Wade, 2008). For the hospital, as KMC baby has a shorter stay in hospital by two days compared with conventional care, medical cost can be saved with a shorter hospitalization (Conde-Agudelo & Díaz-Rossello, 2014).

*Risks of maintaining current practice*

The practice of conventional care is not as effective as KMC does in the promotion of breastfeeding initiation. Babies with artificial feeding do not have a better immune system compared with breastfeeding babies (World Health Organization, 2014). With a weaker immune system, babies are prone to diseases. It increases the workload of the health care team and the medical cost.

*Material costs of implementing the innovation*

If the proposed innovation is implemented, purchase of blankets is needed because the newborns are put on mothers’ breasts covered by the blanket. Additional pulse oximeter, cardiorespiratory monitor and thermometers are needed to monitor the physical conditions of the newborns when undergoing KMC. Other expenses, such as training course for team manager, team leaders and team members, stationery, paper, ink for photocopy, video tape are included in the material costs (Appendix C).
Material costs of not implementing the innovation

As KMC baby had a shorter hospital stay by two days compared with baby undergoing conventional care (Conde-Agudelo & Diaz-Rossello, 2014), current practice may cause more medical cost (Appendix D).

Potential nonmaterial costs of implementing the innovation

In the beginning phrase of the proposed innovation, low staff morale may be encountered because nurses need to attend the training course and meetings, adapt to the new practice. They need time to adapt to the new practice and the workload.

Potential nonmaterial benefits of implementing the innovation

If the proposed innovation is implemented in a long run, nonmaterial benefits will be expected. As KMC helps in breastfeeding initiation from the review studies (Aghdas et al., 2013; Srivastava et al., 2014; Khadivzadeh et al., 2009; Mahmood et al., 2011; Moore et al., 2007), breastfeeding benefits both mothers and newborns. Staff morale may be raised because the health conditions of the clients improve brought by KMC and breastfeeding as well as a better autonomy to carry out KMC.

Chapter 4: Evidence-based practice guidelines
“Kangaroo mother care (KMC) for full term newborns and mothers in delivery suite” guidelines are evidence-based. The objectives are to promote KMC to full term newborns and mothers in the delivery suite, formulate and standardize clinical practice instructions for frontline nurses to carry out KMC practice based on the evidence support and assist mothers to breastfeed their babies during KMC. The target group of the guidelines is nurses who are working in delivery suite. The target clients are those healthy full term newborns and healthy primiparous Chinese mothers aged above 18 under normal vaginal delivery who are willing to carry out KMC.

The recommendations (Appendix E) are in evidence based and the grades of recommendations are from the Scottish Intercollegiate Guidelines Network (SIGN) (Scottish Intercollegiate Guidelines Network, 2014) (Appendix F).

Chapter 5: Implementation Plan

Kangaroo mother care (KMC) helps in breastfeeding initiation for full term infants and mothers from the literature review. However, KMC is not a routine practice in Hong Kong. Therefore, the evidence-based practice guidelines are formulated to facilitate KMC practice in the delivery suite in Hong Kong. In order to introduce KMC practice smoothly, it is necessary to set up an implementation plan to make sure
all stakeholders are familiar with the innovation through good communication. Moreover, there is a pilot test to see the feasibility of KMC practice before it comes to full implementation.

**Communication plan**

*Stakeholders*

Several stakeholders are involved in the KMC practice. It includes the term infants and their mothers and the nursing staff as well as the administrators in the obstetric unit. The target population of the intervention is the term infants and their mothers. The nursing staff includes Advanced Practice Nurses (APN), Registered Nurses (RN) and Lactation Consultant (LC). The administrators are Chief of Service (COS), Departmental Operations Manager (DOM) and Ward Manager (WM). A KMC committee is established with one LC (program manager), three APNs (team leaders) as the supervisors, and forty five RNs including five representative staff are the frontline staff to implement the intervention.

*Communication process*

Approval must be obtained from the administrators including COS, DOM and WM before implementing KMC in obstetric unit. To include KMC practice into the daily
routine of the obstetric unit, firstly, it is important to introduce the idea of the practice, for example, purpose, potential benefits and risks to LC, APNs, RNs and collect their feedbacks during a staff conference. An evidence-based practice KMC protocol will then be proposed and presented to LC, APNs. The EBP protocol will be discussed and revised during management meetings. The literature reviews of the benefits of KMC in breastfeeding initiation for term infants and their mothers, the revised EBP KMC protocol and also the budget plan will be finally presented to COS, DOM and WM. The KMC committee will be set up once all administrators approve and provide the funding to support the innovation.

Communication strategies

KMC is not a routine practice in the proposed setting. To facilitate the new practice into daily routine, several communication strategies are needed. A KMC committee is established, it is composed of one program manager (LC), three team leaders (APNs) and five representative staff (RNs). The five representative staff will collect the opinions about the difficulties and challenges among the frontline nurses during the operation of KMC, and discuss with the team leaders in a weekly meeting. The team leaders will have meeting with the program manager every two weeks to review the progress of the program and to discuss the modification of the KMC guidelines if
needed. The program manager will write a monthly report of the KMC program to report the implementation progress, costs to COS, DOM and WM in a monthly meeting so as to increase the transparency of the practice.

Trainings will be provided by the program manager to team leaders and all frontline nurses. The training will be conducted in two consecutive days (six hours per day in total, three hours in a morning and three hours in an afternoon). The staff will be divided into two big groups to attend either the day one or the day two training.

Evidence-based practice guidelines of KMC, practical skills, problem solving skills, counselling skills, how to fill in the charts such as the integrated breastfeeding monitoring chart (Appendix H) and the Infant Breastfeeding Assessment Tool (IBFAT) will be demonstrated and re-demonstrated in the training. After the training, the team leaders act as a trouble shooter to solve frontline nurses’ problems, and the program manager acts as a consultant for any professional advice and any issues about KMC.

A pocket user guide of KMC will be made and distributed to all frontline nursing staff. Contents include the guidelines of KMC, integrated breastfeeding monitoring chart, IBFAT and the skills in assisting breastfeeding. The pocket user guide will be printed in a water-proof material and can be put in the nurse’s uniform pocket so that they can have a quick brief reference when in daily operation.

In order to increase awareness and understanding of KMC among nurses and mothers,
a poster will be designed and posted on the notice board and the corridor of the delivery suite. Its contents include introducing the benefits of KMC in breastfeeding initiation and its practical skills as well as clarifying the misunderstanding about KMC such as temperature regulation and breathing issue. Furthermore, a video about the steps and skills in practicing KMC will be made and broadcasted in every room of the delivery suite.

A badge will be designed for all frontline nurses to clip on the uniform to ensure the clients to seek help from a right person because the uniform among all staff including nurses, ward steward, ward assistants in the delivery suite is same in colour. It is easy and useful for clients to recognize the right person and ask for help in KMC.

Sustain the change process

To assess the nurses’ compliance with the KMC guideline, auditing (Appendix K) will be conducted every four months by the team leaders. Additional guidance will be provided if the auditing performance of nurse is not satisfactory so as to give support to staff and to keep the practice in high standard.

As the frontline nurses are the main care givers to assist term delivery mothers to perform KMC, they understand the challenges in implementing the practice from daily operation and from the mothers’ opinion. It is important to take their comments
into consideration when revising the new guidelines during regular committee meetings in order to make the innovation be practical and realistic in the proposed setting.

The figure of KMC practice in successful breastfeeding initiation will be shared in the staff notice board to praise the effort of the frontline nurses made and to encourage them to sustain the KMC practice.

**Pilot testing**

Pilot testing is necessary to carry out to test the effectiveness, to detect any possible problems and to modify the EBP guidelines before full implementation of the new KMC practice.

The pilot test will last for one month. It will test six aspects such as the training program, the EBP guidelines, mothers and nurses’ feedbacks toward the KMC practice, outcome of breastfeeding initiation and the cost of running the program.

For the training program, the program manager, three team leaders and one big group of twenty five frontline nurses will be recruited in the pilot test lasting for six hours in a day. The training program contents will be the same as the proposed one (Evidence-based practice guidelines of KMC, practical skills, problem solving skills, counselling skills, how to fill in the forms and charts such as the integrated
breastfeeding monitoring chart and the IBFAT). A focus group interview will be conducted with the twenty five frontline nurses, program manager and the three team leaders aiming to get their feedbacks about the training program and to modify the training program.

About the implementation of the KMC guidelines, those who completed the training program will be included, lasting for three weeks. The total sample will be about 110 (55: KMC; 55: conventional care). If mothers prefer KMC, the trained frontline nurses will assist them in KMC according to the EBP guidelines after getting the written consent. The target population are Chinese mothers aged above eighteen, primiparous with normal vaginal delivery in healthy condition which is defined as not having medical complications such as gestational diabetes mellitus, pregnancy induced hypertension, severe postpartum haemorrhage or breast diseases and their babies who are in full term with healthy condition which is defined as having APGAR score above seven marks at five minutes after birth, without resuscitation after birth and without congenital abnormalities nor severe medical problems. The characteristics of the control group are same as the intervention group except receiving conventional care (infant wrapping in a blanket and placed to mother). This pilot test aims to test whether the guidelines are clear to understand and carry out and to see if the integrated breastfeeding monitoring chart and the IBFAT are in correct
use.

At the end of the pilot testing, evaluation will be made regarding to mothers and nurses’ feedbacks, cost-effectiveness as well as the primary outcome of breastfeeding initiation. A self-reporting questionnaire (Appendix I) will be designed to get the comments from mothers who completed KMC for their full term infants about the instructions of KMC from nurses, material used in KMC, the comfort level, overall satisfaction toward KMC. Also, a self-reporting questionnaire (Appendix J) will be designed to get the feedbacks from nurses who carried out KMC about the training, setting, support, confidence and satisfaction toward KMC. Regular meetings will be made every week between the three team leaders and the five representative nurses; also, between the three team leaders and the program manager every two weeks. Feedbacks from frontline nurses, flow of the program, challenges and other issues concerning KMC will be discussed. Moreover, the actual expenses in the pilot testing will be calculated and analyzed to see if the budget is appropriate. Lastly, to test whether KMC is effective in breastfeeding initiation, IBFAT score will be used as the outcome measure. The IBFAT score will be assessed by the trained frontline nurses at the end of the one-hour KMC after birth.

Chapter 6: Evaluation Plan
In this section, the KMC practice will be evaluated for its outcomes. The nature and number of target population will be calculated. Finally, analysis of data and criteria for effectiveness will be discussed.

**Intervention outcomes**

*Primary outcome: Breastfeeding initiation*

The breastfeeding initiation between term delivery mothers and infants will be measured by the Infant Breastfeeding Assessment Tool (IBFAT) (Appendix G). Readiness to feed, rooting, fixing, sucking pattern are the aspects to assess. Each aspect scores from 0 to 3 marks with a maximum of 12 marks in total score. Successful breastfeeding initiation is defined if the total score of IBFAT is 10 or more (Moore and Anderson, 2007). Nurses who had completed the training course are responsible to assess the sucking ability of infants at the end of the one-hour KMC after birth.

*Secondary outcomes*

*Term delivery mothers’ outcome: satisfaction level toward KMC practice*

A self-reporting questionnaire (Appendix I) about feelings toward information and instructions of KMC from nurses, feelings toward KMC practice, the comfort level,
material used in KMC, overall satisfaction with 5-point Likert scale (1=strongly disagree to 5=strongly agree), with maximum mean score of 5, will be distributed to term delivery mothers who had undergone KMC at the end of KMC practice and get back the questionnaire before they transfer to postnatal ward. The mean score will be recorded for evaluation.

*Frontline nurses’ outcome: Satisfaction level toward KMC practice*

A self-reporting questionnaire (Appendix J) about the views, attitudes and the satisfaction level toward KMC, with 5-point Likert scale (1=strongly disagree to 5=strongly agree), with maximum mean score of 5, will be distributed to the forty five frontline nurses at the end of the month of implementing KMC practice. The mean score will be recorded for evaluation. Frontline nurses are encouraged to share their feedbacks and difficulties with the five representative staff, and discuss it during regular meeting between representative staff, team leaders and program manager.

*Obstetric unit outcomes: Cost*

The cost of implementing KMC practice has to be calculated and reviewed every four months by the program manager to ensure the program cost is within the budget plan. If it exceeds the budget plan, modification of the program is required to control the cost.
Nature and number of clients

Eligibility criteria

The target population are Chinese mothers aged above eighteen, primiparous with normal vaginal delivery in healthy condition which is defined as not having medical complications such as gestational diabetes mellitus, pregnancy induced hypertension, severe postpartum haemorrhage or breast diseases and their babies who are in full term with healthy condition which is defined as having APGAR score above seven marks at five minutes after birth, without resuscitation after birth and without congenital abnormalities nor severe medical problems.

Sample size calculation and recruitment plan

The sample size is calculated by using statistical software (Russ Lenth’s Power And Sample Size Page, 2015). One-sided two sample t-test is used, we use Mahmood, Jamal & Khan’s studies as a reference to calculate the sample size because the study design, setting, intervention, control and the outcome measures are similar to our proposed study (Mahmood, Jamal & Khan, 2011). Therefore, by inputting sigma 1 =1.87, sigma 2= 1.76, alpha= 0.05, power= 0.8, true difference of means= 0.6 (Refer to “Table of evidence” part), the sample size are 114 (KMC) and 114 (conventional care). However, the drop-out rate is set as 27 percent (Mahmood, Jamal & Khan,
2011), therefore, 157 samples of KMC and 157 samples of conventional care are required for the recruitment. There are about 500 newborns born in the proposed hospital per month (Hospital Authority, 2013). We assume the recruitment rate is fifty percent. 250 newborns can be recruited per month. Therefore, two months is needed for the recruitment of samples.

Data analysis

Breastfeeding initiation outcome is measured by using IBFAT. One-sided two-sample t-test is used to analyze the result to evaluate the program’s effectiveness. We assume the null hypothesis is that KMC has no effect in breastfeeding initiation. If the p-value of the t-test is less than 0.05, then the null hypothesis is rejected, which means KMC is effective in breastfeeding initiation.

The attitude, satisfaction level of mothers and nurses toward KMC are measured by the questionnaires with 5-point Likert scale. The results will be evaluated by descriptive statistics and into mean scores.

The actual costs of the materials used and training program are calculated every four months to compare with the estimated budget. If the actual costs exceed the estimated
costs, then the program manager needs to consider whether KMC program worth continuing to implement.

Criteria for effectiveness

The KMC program is viewed to be successful if the following outcomes are achieved:

*Breastfeeding initiation:* 58 percent of the participants score 10 or more in IBFAT (Mahmood, Jamal & Khan, 2011); AND; by comparing the IBFAT score of KMC and conventional care, p value is <0.05.

*Term delivery mothers’ outcome (Satisfaction level toward KMC practice):* 75 percent of the participants’ mean score is in 3.5 marks or above;

*Frontline nurses’ outcome (Satisfaction level toward KMC practice):* 75 percent of the frontline nurses’ mean score is in 3.5 marks or above;

*Obstetric unit outcome:* the actual cost is within the estimated cost (HK$419140).

Conclusion

KMC is an easy, safe and effective practice to promote breastfeeding initiation for term delivery mothers in the delivery suite from the literature review studies. By comparing the cost-benefit ratio of the current practice with KMC practice, KMC is more cost effective and worth implementing. Evidence based guidelines are
formulated for KMC implementation. The innovation will have a comprehensive communication plan for all stakeholders to understand, discuss, review and modify the guidelines, moreover, a pilot test will be conducted to test the feasibility and effectiveness of the program before it is put into full implementation. Outcomes are identified and assessed to evaluate the effectiveness of KMC practice in breastfeeding initiation. Implementing KMC is expected to be a great milestone in the delivery suite by benefitting term infants and their mothers, nurses and the obstetric unit of the hospital.
References


skin-to-skin contact from birth versus conventional incubator for physiological stabilization in 1200 to 2199 gram newborns. *Acta Paediatrica, 93*(6), 779-785.


<table>
<thead>
<tr>
<th>Study</th>
<th>Design</th>
<th>Participants / Setting</th>
<th>Intervention</th>
<th>Control</th>
<th>Outcome measures</th>
<th>Effect size</th>
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<tbody>
<tr>
<td>Aghdas, Talat &amp; Sepideh (2013)</td>
<td>RCT</td>
<td>Primiparous, Iranian, healthy, full term mothers between 18 and 35 years old, normal vaginal delivery</td>
<td>Skin-to-skin contact (SSC): Infants were placed naked against mothers’ skin in prone position for at least 2 hours. Infants’ heads covered with dry caps and warm blankets placed on backs. Weighing, vitamin K injection postponed for 2 hours (n=57)</td>
<td>Routine care group (RC): Infants were kept under a radiant heater immediately after cutting cords. Received vitamin K injection, measured weight, length, head circumference. Then wrapped in pre-heated blankets and transferred to mothers (n=57)</td>
<td>(a) Maternal breastfeeding self-efficacy (BSES) at 28 days postpartum (b) Success of first breastfeed (IBFAT) with score ≥10 (c) Mean time of first breastfeeding initiation</td>
<td>For all tests level of significance in terms of p value was 0.05 (a) SSC: 53.42+/-8.57 SD RC: 49.85 +/-5.5 p=0.0008 (b) SSC: 56.6% RC: 35.6% p=0.02 (c) SSC: 21.98+/-9.10 SD min RC: 66.55+/-20.76 SD min p&lt;0.0001</td>
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BSES= Breastfeeding self-efficacy scale
IBFAT= Infant Breast Feeding Assessment tool
Tam YUK Ting

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<th>Study</th>
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| Mahmood, Jamal & Khan (2011) | RCT | Healthy, full term mothers with spontaneous vaginal delivery with intention to exclusively breastfeed for at least one month. Infants’ gestation > 37 weeks, BW > 2500 grams without resuscitation beyond oro-pharyngeal suction were included. | Skin-to-skin contact (SSC): Infants were delivered on mothers’ abdomen and after drying, naked infants were placed prone against mothers’ skin, between the breasts. Heads covered with dry caps and backs with pre-warm sheets. Ended when taken first feed within at least 45 mins OR did not take feed within 120 mins (n=92) | Conventional care group (CC): Infants were shifted to radiant warmer immediately after cutting cords. Cleaned and wrapped with pre-warm sheets. Transferred to postnatal ward with mothers and first feed was started when mothers were ready (n=91) | (a) Success of first breastfeed (IBFAT) with score ≥10  
(b) Mean IBFAT score  
(c) Maternal satisfaction with the care received  
(d) Preference for same post-delivery care in future  
(e) Index of breastfeeding status (IBS)  
(f) Time to initiate first breastfeed (minutes)  
(g) Time to effective breastfeeding (minutes) | For all tests level of significance in terms of p value was <0.05  
(a) SSC: 58.8%  
CC: 32.5%  
p=0.001  
(b) SSC: 8.87 +/- 1.87  
CC: 8.27 +/- 1.76  
p<0.001  
(c) p<0.001  
(d) p<0.001  
(e) p=0.025  
(f) SSC: 40.62  
CC: 101.88  
p<0.001  
(g) SSC: 149.69  
CC: 357.50  
p<0.001 |

IBFAT= Infant Breast Feeding Assessment tool  
IBS = Index of breastfeeding status

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<th>Effect size</th>
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| Srivastava, Gupta, Bhatnagar & Dutta (2014) | RCT | Term babies with singleton normal delivery who did not require resuscitation beyond the initial steps post-partum | Skin-to-skin contact (SSC): Naked neonate with cap and nappy prone on mother’s chest and covered with bed sheet and blanket within 30 min of birth with weighing and declaration of sex done beforehand, continued for not less than 2 hours (n=122) | Control group (CG): standard care. After drying and weighing, baby was clothed, wrapped in a sheet and a blanket and placed next to mother (n=118) | (a) IBFAT score  
(b) Body weight loss  
(1) Discharge (24-36 hr of birth)  
(2) Follow up (4th/5th day of birth)  
(c) Maternal satisfaction on a four point Likert scale  
(d) Mode of feeding-Exclusive breastfeeding  
(1) Follow up (4th/5th day of birth)  
(2) Follow up (6 weeks post birth)  
(e) Baby morbidity during the first 6 weeks of life  
(f) Baby’s axillary temperature | (a) SSC: 9.55  
CG: 6.77  
p<0.0001  
(b) (1) SSC: 4%+/-1.98%  
CG: 6.1%+/-2.6%  
p<0.0001  
(2) SSC: 6.3%+/-2%  
CG: 9.2%+/-2.8%  
p<0.0001  
(c) p<0.0001  
(d) (1) SSC: 86.1%  
CG: 66.9%  
p=0.002  
(2) SSC: 85.2%  
CG: 63.6%  
p<0.0001  
(e) SSC: 0.0%  
CG: 5.9%  
p=0.006  
(f) P<0.0001 |

IBFAT= Infant Breast Feeding Assessment tool

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<th>Effect size</th>
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| Khadivzadeh & Karimi (2009) | RCT    | Mothers: ≥18 years old, primiparous, tendency to have natural child-birth and breastfeeding, having no history of medical problems, mental disease or using banned drugs  
Infants: ≥2500 grams, ≥37 weeks gestational age, first and 5th minute APGAR score ≥7, without medical problems | Skin-to-skin contact (SSC): Infant was dried, covered with cap, back covered with warm blanket, put in prone position between mother’s breasts immediately after birth for at least 2 hours. Body weight, height, head circumference were measured, vitamin K was injected after 2 hours post birth (n=47) | Control group (CG): Infant shown to mother and put under radial warmer to perform physical assessment and vitamin K injection. Infants was wrapped with a blanket and handed to mother after repairing mother’s rupture of perineum or episiotomy (n=45) | (a) Success of first breastfeed (IBFAT) with score ≥10  
(b) Duration of time from birth to first breastfeeding (min)  
(c) Breastfeeding rate during the first 30 minutes post birth  
(d) Duration of breastfeeding (min) | Level of significance in terms of p value was <0.05  
(a) SSC: 56.6%  
CG: 35.6%  
p=0.02  
(b) SSC: 21.98+/−9.1  
CG: 66.55+/−20.76  
p<0.001  
(c) SSC: 89.4%  
CG: 2.2%  
p<0.001  
(d) SSC: 57.59+/−14.23  
CG: 17.81+/−8.41  
P=0.0001 |

IBFAT= Infant Breast Feeding Assessment tool

<table>
<thead>
<tr>
<th>Study</th>
<th>Design</th>
<th>Participants / Setting</th>
<th>Intervention</th>
<th>Control</th>
<th>Outcome measures</th>
<th>Effect size</th>
</tr>
</thead>
</table>
| Moore & Anderson (2007)| RCT    | Mothers: ≥18 years old, primiparous, spontaneous vaginal delivery, planning to breastfeed for at least 1 month postpartum, no preexisting medical complications, no history of psychiatric illness or illicit drug use. Infants: BW ≥ 2268g, ≥37 weeks’ gestation, APGAR score at 5th minute ≥ 7, no medical complications at birth. | Skin-to-skin contact (SSC): Placed prone on mothers’ abdomen immediately after birth, gently dried, head with cap. After cord was cut, infant was moved to the radiant warmer for same admission procedures as the CG. Then, naked infant with cap was placed prone on mother’s bare chest and covered across the back with two pre-warmed blankets while mother is having perineal laceration or episotomy repair (n=10) | Control group (CG): Placed under a radiant warmer for a brief physical examination, vitamin K injection, erythromycin ophthalmic ointment. Swaddled in two prewarmed blankets and to mothers after perineal laceration or episotomy repair (n=10) | (a) Initial IBFAT score SSC: 8.7 CG: 6.3 p<0.02  
(b) Time of effective breastfeeding SSC: 935 mins CG: 1737 mins p<0.04  
(c) Breastfeeding exclusivity at 1 month post-birth by IBS No significant difference  
(d) Number of breastfeeding problems by BES No significant difference |
## Table 2: Quality assessment table of RCTs (Internal validity)

<table>
<thead>
<tr>
<th>Bibliographic citation</th>
<th>Clearly focused question</th>
<th>Random allocation</th>
<th>Adequate concealment</th>
<th>Double-blind treatment collection</th>
<th>Group similarity at the start</th>
<th>Differences between groups</th>
<th>Valid measurement of outcomes</th>
<th>Drop out rate</th>
<th>Intent to treat analysis</th>
<th>Comparability results for all sites</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aghdas et al. (2013)</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>14.8 %</td>
<td>Does not apply</td>
<td>Does not apply</td>
</tr>
<tr>
<td>Mahmood et al., 2011</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>15.6 %</td>
<td>Does not apply</td>
<td>Does not apply</td>
</tr>
<tr>
<td>Srivastava et al., 2014</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>19.5 %</td>
<td>Does not apply</td>
<td>Does not apply</td>
</tr>
<tr>
<td>Khadivzadeh et al., 2009</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>0 %</td>
<td>Does not apply</td>
<td>Does not apply</td>
</tr>
<tr>
<td>Moore et al., 2007</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>13 %</td>
<td>Does not apply</td>
<td>Does not apply</td>
</tr>
</tbody>
</table>
### Table 3: Quality assessment table of RCTs (Overall assessment)

<table>
<thead>
<tr>
<th>Bibliographic citation</th>
<th>Quality</th>
<th>Direction of bias</th>
<th>Effect due to KMC</th>
<th>Results applicable to target groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aghdas et al. (2013)</td>
<td>++</td>
<td></td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Mahmood et al., 2011</td>
<td>+</td>
<td>Mothers who had given birth previously may have breastfeeding experience</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Srivastava et al., 2014</td>
<td>++</td>
<td></td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Khadivzadeh et al., 2009</td>
<td>++</td>
<td></td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Moore et al., 2007</td>
<td>+</td>
<td>Small sample size</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Coding system: ++ = High quality; + = Fair quality; - = Low quality
## Appendix A: SIGN 50 Methodology Checklist 2: Randomized Controlled Trials

**Methodology Checklist 2: Controlled Trials**

| Study identification (Include author, title, year of publication, journal title, pages). |
| Guideline topic: | Key Question No.: | Reviewer: |

**Before completing this checklist, consider:**

1. **Is the paper a randomised controlled trial or a controlled clinical trial?** If in doubt, check the study design algorithm available from SIGN and make sure you have the correct checklist. If it is a controlled clinical trial questions 1.2, 1.3, and 1.4 are not relevant, and the study cannot be rated higher than 1+.  
2. **Is the paper relevant to key question? Analyse using PICO (Patient or Population Intervention Comparison Outcome).** IF NO REJECT (give reason below). IF YES complete the checklist.

**Reason for rejection:** 1. Paper not relevant to key question □ 2. Other reason □ (please specify): □

### SECTION 1: INTERNAL VALIDITY.

<table>
<thead>
<tr>
<th>In a well conducted RCT study...</th>
<th>Does this study do it?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1. The study addresses an appropriate and clearly focused question.</td>
<td>Yes □, No □, Can't say □</td>
</tr>
<tr>
<td>1.2. The assignment of subjects to treatment groups is randomised.</td>
<td>Yes □, No □, Can't say □</td>
</tr>
<tr>
<td>1.3. An adequate concealment method is used.</td>
<td>Yes □, No □, Can't say □</td>
</tr>
<tr>
<td>1.4. Subjects and investigators are kept 'blind' about treatment allocation.</td>
<td>Yes □, No □, Can't say □</td>
</tr>
<tr>
<td>1.5. The treatment and control groups are similar at the start of the trial.</td>
<td>Yes □, No □, Can't say □</td>
</tr>
<tr>
<td>1.6. The only difference between groups is the treatment under investigation.</td>
<td>Yes □, No □, Can't say □</td>
</tr>
<tr>
<td>1.7. All relevant outcomes are measured in a standard, valid and reliable way.</td>
<td>Yes □, No □, Can't say □</td>
</tr>
<tr>
<td>1.8. What percentage of the individuals or clusters recruited into each treatment arm of the study dropped out before the study was completed?</td>
<td></td>
</tr>
<tr>
<td>1.9. All the subjects are analysed in the groups to which they were randomly allocated (often referred to as intention to treat analysis).</td>
<td>Yes □, No □, Can't say □, Does not apply □</td>
</tr>
<tr>
<td>1.10. Where the study is carried out at more than one site, results are comparable for all sites.</td>
<td>Yes □, No □, Can't say □, Does not apply □</td>
</tr>
</tbody>
</table>
SECTION 2: OVERALL ASSESSMENT OF THE STUDY

2.1. How well was the study done to minimise bias?  
Code as follows:
- High quality (++): □
- Acceptable (+): □
- Unacceptable – reject 0: □

2.2. Taking into account clinical considerations, your evaluation of the methodology used, and the statistical power of the study, are you certain that the overall effect is due to the study intervention?

2.3. Are the results of this study directly applicable to the patient group targeted by this guideline?

2.4. Notes. Summarise the authors’ conclusions. Add any comments on your own assessment of the study, and the extent to which it answers your question and mention any areas of uncertainty raised above.

---

1 Unless a clear and well defined question is specified, it will be difficult to assess how well the study has met its objectives or how relevant it is to the question you are trying to answer on the basis of its conclusions.

2 Random allocation of patients to receive one or other of the treatments under investigation, or to receive either treatment or placebo, is fundamental to this type of study.

3 Allocation concealment refers to the process used to ensure that researchers are unaware which group patients are being allocated to at the time of entry into the study. Research has shown that where allocation concealment is inadequate, investigators can overestimate the effect of interventions by up to 40%.

4 Blinding refers to the process whereby people are kept unaware of which treatment an individual patient has been receiving when they are assessing the outcome for that patient. It can be carried out up to three levels. Single blinding is where patients are unaware of which treatment they are receiving. Double blind studies as either the clinician nor the patient knows which treatment is being given. In very rare cases studies may be triple blinded, where neither patients, clinicians nor those conducting the analysis are aware of which patients received which treatment. The higher the level of blinding, the lower the risk of bias (intro study).

5 Patients selected for inclusion in a trial must be as similar as possible. The study should report any significant differences in the composition of the study groups in relation to gender, age, stage of disease (if appropriate), social background, ethnic origin, or comorbid conditions. These factors may be covered by inclusion and exclusion criteria, rather than being reported directly. Failure to address this question, or the use of inappropriate groups, should lead to the study being downgraded.

6 If some patients received additional treatment, even if of a minor nature or consisting of advice and counselling rather than a physical intervention, this treatment is a potential confounding factor that may invalidate the results. If groups were not treated equally, the study should be rejected unless no other evidence is available. If the study is used as evidence it should be treated with caution.

7 The primary outcome measures used should be clearly stated in the study. If the outcome measures are not stated, or the study relies on its secondary outcomes, the study should be rejected. Where outcome measures require any degree of subjectivity, some evidence should be provided that these measures are reliable and have been validated prior to their use in the study.

8 The number of patients that drop out of a study should give concern if the number is very high. Conventionally, a 20% dropout rate is regarded as acceptable, but this may vary. Some regard should be paid to why patients dropped out, as well as how many. It should be noted that the drop out rate may be expected to be higher in studies conducted over a longer period of time. A higher drop out rate will normally lead to downgrading, rather than rejection of a study.

9 In practice, it is rare that all patients allocated to the intervention group receive the intervention throughout the trial, or that all those in the comparison group do not. Patients may refuse treatment, or contra indications arise that lead them to be switched to the other group. If the comparability of groups through randomisation is to be maintained, however, patient outcomes must be assessed according to the group to which they were originally allocated irrespective of the treatment they actually received. (This is known as intention to treat analysis.) If it is clear that analysis was not on an intention to treat basis, the study may be rejected. If there is little other evidence available, the study may be included but should be evaluated as if it were a non randomised cohort study.

10 In multi-centre studies, confidence in the results should be increased if it can be shown that similar results were obtained at the different participating centres.

11 Rate the overall methodological quality of the study using the following as a guide: High quality (++): Majority of criteria met, little or no risk of bias. Results unlikely to be changed by further research. Acceptable (+): Most criteria met, some flaws in the study with an associated risk of bias. Conclusions may change in light of further studies. Low quality (0): Either most criteria not met, or significant flaws relating to key aspects of study design. Conclusions likely to change in the light of further studies.
**Appendix B: Infant Breastfeeding Assessment Tool (IBFAT)**

<table>
<thead>
<tr>
<th>Score</th>
<th>3</th>
<th>2</th>
<th>1</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Readiness to feed</td>
<td>Starts to feed readily without effort</td>
<td>Needs mild stimulation to begin feeding</td>
<td>Needs more stimulation to rouse and begin feeding</td>
<td>Cannot be aroused</td>
</tr>
<tr>
<td>Rooting</td>
<td>Roots effectively at once</td>
<td>Needs some coaxing, prompting, or encouragement</td>
<td>Roots poorly even with coaxing</td>
<td>Did not try to root</td>
</tr>
<tr>
<td>Fixing (latch on)</td>
<td>Feeds immediately</td>
<td>Takes 3-10 minutes to start</td>
<td>Takes over 10 minutes to start</td>
<td>Did not feed</td>
</tr>
<tr>
<td>Sucking pattern</td>
<td>Sucks well on both breasts</td>
<td>Sucks on and off but needs encouragement</td>
<td>Weak suck, sucks on and off for short periods</td>
<td>Did not suck</td>
</tr>
<tr>
<td>Maximum possible</td>
<td>12</td>
<td>8</td>
<td>4</td>
<td>0</td>
</tr>
</tbody>
</table>
Appendix C: Budget plan of the proposed KMC program

<table>
<thead>
<tr>
<th>Training cost (One-time cost)</th>
<th>Hours</th>
<th>Expenses (HK$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program manager (1 Lactation consultant)</td>
<td>8</td>
<td>3200 (400/hr)</td>
</tr>
<tr>
<td>Team leaders (3 APNs)</td>
<td>8</td>
<td>6240 (260/hr)</td>
</tr>
<tr>
<td>Nurses (45 RNs)</td>
<td>6</td>
<td>40500 (150/hr)</td>
</tr>
<tr>
<td><strong>Total:</strong></td>
<td><strong>302 hours</strong></td>
<td><strong>HK$49940</strong></td>
</tr>
</tbody>
</table>

Material costs (Yearly cost)

<table>
<thead>
<tr>
<th>Expenses (HK$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blankets (300 pieces: $20/each)</td>
</tr>
<tr>
<td>Stationery</td>
</tr>
<tr>
<td>Ink for photocopy</td>
</tr>
<tr>
<td>Paper</td>
</tr>
<tr>
<td>Video tape</td>
</tr>
<tr>
<td>Pulse oximeter ($10000/each)</td>
</tr>
<tr>
<td>Thermometer ($50/each)</td>
</tr>
<tr>
<td>Cardiorespiratory monitor ($20000/each)</td>
</tr>
<tr>
<td><strong>Total:</strong></td>
</tr>
<tr>
<td><strong>Total cost:</strong></td>
</tr>
</tbody>
</table>

Appendix D: Cost of current practice

<table>
<thead>
<tr>
<th>Current hospital expenses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nursery</td>
</tr>
<tr>
<td>Approximate 500 full term newborns/month ($3000 x 500)</td>
</tr>
<tr>
<td>Approximate 6000 full term newborns/year ($3000 x 500 x 12)</td>
</tr>
</tbody>
</table>

Comparison of budget between KMC practice and current practice

<table>
<thead>
<tr>
<th>KMC practice cost (Yearly)</th>
<th>Current practice (Yearly)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HK$419140</td>
<td>HK$18000000</td>
</tr>
</tbody>
</table>

Saving: HK$17580860 per year
Appendix E: Evidence-based practice guidelines
Kangaroo mother care (KMC) for full term newborns and mothers in delivery suite

Objectives
-To promote KMC to full term newborns and mothers in the delivery suite
-To formulate and standardize clinical practice instructions for frontline nurses to carry out KMC practice based on the evidence support
-To assist mothers to breastfeed their babies during KMC.

Target guideline user
Nurses working in delivery suite.

Target clients
Baby:
- Full term
- APGAR score above seven marks at five minutes after birth
- Without resuscitation after birth
- Without congenital abnormalities
- Without severe medical problems.

Mother:
- Chinese
- Aged above eighteen
- Primiparous
- Under normal vaginal delivery
- Without medical complications (gestational diabetes mellitus, pregnancy induced hypertension, severe postpartum haemorrhage or breast diseases)

Recommendations
1. When to begin KMC
After getting the written consent from mother, KMC should be started soon after drying of baby and completion of physical assessment of both baby and mother.

Evidence: Drying can prevent heat loss. Physical assessment can make sure the baby and mother are suitable for KMC (Moore & Anderson, 2007) (1+).
Grade: A
2. Duration of KMC
KMC should be more than sixty minutes in one session and gradually increases until the mother feels tired and is not willing to continue. It is interrupted only when changing napkins or when the physical condition of baby or mother is not suitable to continue KMC. KMC can be continued to practice when the mother and baby are transferred to the postnatal ward if possible.

Evidence: KMC session should last not less than sixty minutes because frequent changes are too stressful for the baby (Kadam et al., 2005) (1+).
Grade: A

3. KMC position
Place the baby on and between the mother’s breasts, chest to chest. Cover the baby with a blanket. The baby’s head is turned to one side, in a slightly extended position. The hips should be flexed in a frog position. The arms should be flexed. Baby’s abdomen should not be constricted and should be at the level of the mother’s epigastrium.

Evidence: The head position can allow opening of the airway and eye contacts between mother and baby. The abdomen of baby is not constricted so as to maintain enough space for abdominal breathing and mother’s breathing can stimulate the baby (Bergman et al., 2004; World Health Organization, 2003) (1+).
Grade: A

4. Monitor baby’s condition during KMC
Nurses should measure the baby’s axillary temperature before, every thirty minutes, end of KMC and observe the breathing pattern, well-being and measure the oxygen saturation as well as the heart rate during the whole process of KMC.

Baby in KMC position can retain normal body temperature of 36.5°C to 37.4°C. The normal heart rate of a full-term newborn should be ranging from 120 to 160 beats per minute. The normal respiratory rate of a baby should be between 30 and 60 breaths per minute without apnoea. The baby’s lips and face should not turn blue. Oxygen saturation of a full-term baby should be above 94 percent (Ludington-Hoe et al., 2000; Ludington-Hoe et al., 2004)
Evidence: Hypothermia is rare in KMC infants but it can occur (World Health Organization, 2003) (4). Prone position is one of the risk factor of Sudden Infant Death Syndrome (1++).
5. Feeding during KMC
Nurses should make sure that the baby’s suckles in a correct position and good attachment. Nurses measure the initial breastfeeding behavior by using Infant Breastfeeding Assessment Tool (IBFAT) and record the time of breastfeeding initiation.
Correct position: Mother should support the baby’s whole body and maintain the baby’s head and body straight. Both the mother’s and baby’s body are kept close. The baby should face her breasts and baby’s nose is opposite to her nipple.
Good attachment: The baby’s chin should touch mother’s breast with a widely opened mouth and with a turning out lower lip. A larger area of the areola should be seen above the baby’s mouth. The baby should suck in a slow and deep pattern (World Health Organization, 2003).

Evidence: Infant Breastfeeding Assessment Tool (IBFAT) is a reliable and the most frequently used breastfeeding assessment tool (Aghdas, Talat & Sepideh, 2013; Hill and Johnson, 2007) (1+)
Grade: A
Appendix F: Levels of evidence and Grades of recommendation

Levels of evidence
1++ High quality meta analyses, systematic reviews of RCTs, or RCTs with a very low risk of bias

1+ Well conducted meta analyses, systematic reviews of RCTs, or RCTs with a low risk of bias

1 - Meta analyses, systematic reviews of RCTs, or RCTs with a high risk of Bias

2++ High quality systematic reviews of case-control or cohort studies
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

2+ 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

2 - Case control or cohort studies with a high risk of confounding, bias, or chance and a significant risk that the relationship is not causal

3 Non-analytic studies, e.g. case reports, case series

4 Expert opinion

Grades of recommendation
A At least one meta analysis, systematic review, or RCT rated as 1++, and directly applicable to the target population; or

A systematic review of RCTs 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+
## Appendix G: Infant Breastfeeding Assessment Tool (IBFAT)

<table>
<thead>
<tr>
<th></th>
<th>3</th>
<th>2</th>
<th>1</th>
<th>0</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Readiness to feed</strong></td>
<td>Starts feed readily without effort</td>
<td>Needs mild stimulation to begin</td>
<td>Needs more stimulation to rouse and begin feeding</td>
<td>Cannot be aroused</td>
<td></td>
</tr>
<tr>
<td><strong>Rooting</strong></td>
<td>Roots effectively at once</td>
<td>Needs some coaxing, prompting, or encouragement</td>
<td>Roots poorly even with coaxing</td>
<td>Did not try to root</td>
<td></td>
</tr>
<tr>
<td><strong>Fixing (latch on)</strong></td>
<td>Feeds immediately</td>
<td>Takes 3-10 minutes to start</td>
<td>Takes over 10 minutes to start</td>
<td>Did not feed</td>
<td></td>
</tr>
<tr>
<td><strong>Sucking pattern</strong></td>
<td>Sucks well on both breasts</td>
<td>Sucks on and off but needs encouragement</td>
<td>Weak suck, sucks on and off for short periods</td>
<td>Did not suck</td>
<td></td>
</tr>
</tbody>
</table>

**Total score**
Appendix H: Integrated Breastfeeding Monitoring Chart

Name of mother and age: _____________________________________________
Gestation: _________________ Gravidity and Parity: G___P___
Date of birth (Baby): _________________ Time of delivery: _________________
Delivery mode: ______________________ Birth weight: _________________ kg
APGAR score: (1st minute)___________(5th minute)___________

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Duration of KMC/Conventional care (CC)</th>
<th>Breastfeeding (Yes / No)</th>
<th>Vital signs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>KMC/CC Start time</td>
<td>End time</td>
<td>Duration</td>
</tr>
<tr>
<td></td>
<td></td>
<td>appendix</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
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<td>appendix</td>
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<tr>
<td></td>
<td></td>
<td>appendix</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Appendix I: Self-reported questionnaire for mothers undergoing KMC

<table>
<thead>
<tr>
<th>Name of mother: __________________________</th>
<th>Date: ______________________</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Strongly disagree</td>
<td>Disagree</td>
<td>Uncertain</td>
<td>Agree</td>
<td>Strongly agree</td>
</tr>
<tr>
<td>1</td>
<td>I am satisfied with the KMC information and instructions provided by the nurses.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>I find KMC is easy and convenient to practice.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>I feel comfortable when practicing KMC.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>I am satisfied with the materials used in KMC.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Overall, I am satisfied with KMC practice.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Mean score**: \((1+2+3+4+5)/5\)

Other comments / suggestions:
### Appendix J: Self-reported questionnaire for nurses implementing KMC

Name of nurse: ________________________

Date: ______________________

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Strongly disagree</td>
<td>Disagree</td>
<td>Uncertain</td>
<td>Agree</td>
<td>Strongly agree</td>
</tr>
</tbody>
</table>

1. I am satisfied with the KMC training provided.
2. I am satisfied with the KMC setting.
3. The support of KMC implementation is enough.
4. I am confident to implement KMC program.
5. Overall, I am satisfied with KMC implementation.

**Mean score:** \( \text{total score of item (1+2+3+4+5)/5} \)

Other comments / suggestions:
## Appendix K: Audit form of KMC

Name of nurse:

<table>
<thead>
<tr>
<th>Question</th>
<th>Pass / Fail</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Written consent obtained from participant?</td>
<td></td>
</tr>
<tr>
<td>2. Right time to implement KMC?</td>
<td></td>
</tr>
<tr>
<td>3. Duration of KMC <em>(Verbal answer is acceptable)</em></td>
<td></td>
</tr>
<tr>
<td>4. Mother and infant are in correct position in KMC practice?</td>
<td></td>
</tr>
<tr>
<td>5. Proper use of materials provided (Blanket, electronic thermometer,</td>
<td></td>
</tr>
<tr>
<td>cardiorespiratory monitor, pulse oximeter)?</td>
<td></td>
</tr>
<tr>
<td>6. Understand the normal range of vital signs of newborn? *(Verbal</td>
<td></td>
</tr>
<tr>
<td>answer is acceptable)*</td>
<td></td>
</tr>
<tr>
<td>7. Being helpful in KMC implementation?</td>
<td></td>
</tr>
<tr>
<td>8. Correct documentation (IBFAT, integrated breastfeeding chart)?</td>
<td></td>
</tr>
</tbody>
</table>

**Overall: Pass / Fail**

**Other comments / suggestion:**

Name of auditor: ______________________

Signature of auditor: ______________________

Date: ______________________
Appendix L: PRISMA 2009 Flow Diagram

Records identified through database searching (n = 50)

Additional records identified through other sources (n = 0)

Records after duplicates removed (n = 50)

Records screened (n = 50)

Records excluded (n = 42)

Full-text articles assessed for eligibility (n = 8)

Full-text articles excluded, with reasons:
>10 years of publication, not human study, not in English (n = 6)

Studies included in qualitative synthesis (n = 0)

Studies included in quantitative synthesis (meta-analysis) (n = 2)