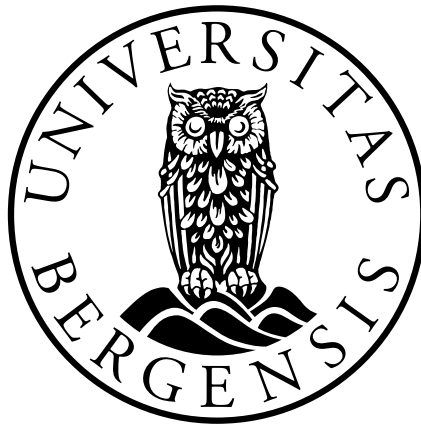


Individual peer counselling for exclusive breastfeeding in Uganda

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To all breastfeeding mothers

Contributors



This thesis is the result of collaboration between the Department of Paediatrics and Child Health of Makerere University and the Centre for International Health, University of Bergen. It was funded by The Norwegian Programme for Development, Research and Education, (NUFU: grant No. 43/2002 'Essential Nutrition and Child Health in Uganda). The research was done within the Uganda site of the PROMISE-EBF trial, a multi-centre cluster-randomised behavioural intervention trial carried out in 4 African countries, Burkina Faso in West Africa, Uganda in East Africa, Zambia in Central Africa and South Africa (www.clinicaltrials.gov, Id no: NCT00397150). PROMISE EBF is an acronym for: *Promoting Infant Health and Nutrition in Sub-Saharan Africa: Safety and Efficacy of Exclusive Breastfeeding Promotion in the Era of HIV*. Two sites were chosen for this work, Iganga and Mbale in Eastern Uganda. Iganga was the pilot site whereas Mbale was the main trial site.

My interaction with the members of the PROMISE Research Consortium and participation in the implementation of the study contributed a lot to my learning experience.

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Abbreviations

AFASS	Acceptable, Feasible, Affordable, Sustainable, Safe (WHO's criteria for formula feeding/replacement feeding)
AIDS	Acquired immunodeficiency syndrome
ARV	Anti-retroviral
BFHI	Baby-friendly hospital initiative (launched by UNICEF/WHO1991)
CI	Confidence interval
EBF	Exclusive breastfeeding
FGD	Focus group discussion
GOBI FFF	Growth monitoring, Oral rehydration salts, Breastfeeding, Immunization, Female education, Family planning, Food fortification
HIV	Human immunodeficiency virus
IBFAN	International Baby Food Action Network
IM	Intervention mapping
ORS	Oral rehydration solution
PHC	Primary health care
PMTCT	Prevention of mother-to-child transmission
PR	Prevalence ratio
PROMISE-EBF	Promoting infant health and nutrition in sub-Saharan Africa: safety and efficacy of exclusive breastfeeding promotion in the era of HIV
Qual	Qualitative methodology as minor component
QUAL	Qualitative methodology as predominant component
Quan	Quantitative methodology as minor component
QUAN	Quantitative methodology as predominant component
SCT	Social cognitive theory
SD	Standard deviation
UN	United Nations
UNICEF	United Nations Children's Fund
WHA	World Health Assembly
WHO	World Health Organisation

Original papers

This thesis is based on the following papers:

Paper I

Jolly Nankunda, James K Tumwine, Åshild Soltvedt, Nulu Semiyaga, Grace Ndeezi, Thorkild Tylleskär: Community based peer counsellors for support of exclusive breastfeeding: experiences from rural Uganda. *Int Breastfeed J* 2006; **1**:19.

Paper II

Jolly Nankunda, Thorkild Tylleskär, Grace Ndeezi, Nulu Semiyaga, James K Tumwine: for the PROMISE-EBF Study Group. Establishing individual peer counselling for exclusive breastfeeding in Uganda: implications for scaling-up. *Matern Child Nutr* 2010;**6**:53-66.

Paper III

Jolly Nankunda, James K Tumwine, Victoria Nankabirwa, Thorkild Tylleskär, for the PROMISE-EBF Study Group. “She would sit with me”. Mothers’ experiences of individual peer support for exclusive breastfeeding in Uganda. *Int Breastfeed J* 2010;**5**:16

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Abstract

Introduction

Breastfeeding remains a potent child survival strategy estimated to save up to 1.5 million infant deaths every year when optimally practiced. Despite breastfeeding being universal in most of sub-Saharan Africa, exclusive breastfeeding (EBF) is rarely practiced. Peer counselling for EBF, particularly in non-African settings, has been reported to lead to increased EBF levels. This thesis explores the experiences from the process of setting up a community-based individual peer counselling intervention for support of EBF in a trial in Eastern Uganda, and assesses its effect on mothers who opted to breastfeed.

Methods

This thesis is composed of three sub-studies done within a multi-centre cluster-randomized behavioural intervention trial (PROMISE-EBF) to assess the effect of individual peer counselling on EBF rates as one of its primary objectives. The trial took place in Burkina Faso, Uganda, Zambia and South Africa, but the focus of this thesis was on the process of setting up the peer counselling in the Ugandan urban and rural sites. The first sub-study assessed by qualitative methods the feasibility of training rural women as peer counsellors for EBF in the Iganga district in preparation for the main study. The next sub-study also used qualitative methods to explore the process of selection, training and follow-up of peer counsellors for the PROMISE-EBF trial in the Mbale district. The peer counsellors were given a pre- and post-test questionnaire to assess the effect of training and follow-up on their knowledge and attitudes towards EBF. Observations made during the study and field notes were used to understand this process. The last sub-study was cross-sectional following completion of the peer counselling visits which explored the perceptions and experiences of the supported women and how they felt about the peer counselling intervention. For this sub-study, we employed a mixed methods approach (qualitative and quantitative) and a semi-structured questionnaire for data capture.

Results

Training rural women with modest formal education to help their peers with breastfeeding proved feasible. Peer counselling for EBF was acceptable to the communities where it had been introduced by systematically involving community members and getting them, to participate in the selection process. The peer counsellors appreciated supervisory visits, which offered a venue for sharing their achievements and challenges. In the PROMISE-EBF study in Mbale, all the peer counsellors worked throughout the entire duration of the trial. Before training, the peer counsellors had some knowledge gaps and negative attitudes regarding EBF, but were positively influenced by the training and follow-up. The supported women were happy to have someone familiar from their community sit with them at home to help them with breastfeeding practices. The women receiving counselling were generally satisfied with its different aspects. Satisfaction was most prominent within the group that received 5 or more visits compared to the group that received <5 visits (80% versus 59%, $p < 0.001$). The fathers and grandmothers influenced the infant feeding decisions adopted by the mothers.

Conclusions

Systematic planning and implementation of the peer counselling intervention for EBF was useful for making it acceptable to the community. Peers offered huge potential for breastfeeding support that was highly accepted among the supported mothers. In this rural Ugandan community where infant feeding decisions were made in consultation, involving other members of the family - especially the fathers and grandmothers - during the process of peer counselling appeared to improve the desired behaviour of practising EBF. In case of scale-up of this intervention, the main points to emphasise include: community involvement, proper training using appropriate culturally sensitive curricula and effective support supervision for the peer counsellors.

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If only one more infant could enjoy a healthier life as a result of improved feeding in their first year of life, I would say “it was worth all the effort”.

Introduction

Breastfeeding has been identified as an important child survival strategy by the World Health Organisation (WHO) and UNICEF. It has been estimated that increasing optimal breastfeeding practices could save up to 1.5 million infant lives every year since breastfeeding protects infants against diarrhoeal diseases, pneumonia and neonatal sepsis [1, 2]. In addition, breast milk remains a superior “food” for babies, since it contains optimal amounts of fats, sugar, water and protein needed for their growth and development [3, 4].

In recent years, more emphasis has been given to promoting EBF in the first 6 months of life rather than just any other breastfeeding practice. Before 2001, WHO recommended EBF of infants of 4-6 months, but this was revised to 6 months following reports of the adequacy of breast milk alone for the nutrient needs of babies up to this age [5]. Following this, a number of facility- and community-based interventions have been employed to promote EBF. Of these, peer counsellors for support of EBF seem to increase the rate of EBF among the supported women [6-10]. However, most reports on peer counsellors for breastfeeding are based on studies outside sub-Saharan Africa. This thesis focuses on the establishment of peer counselling intervention to help women in a low-income and high HIV prevalence setting in sub-Saharan Africa to undertake exclusive breastfeeding for 6 months.

Breastfeeding

In humans, breastfeeding refers to a process where an infant or a young child is fed with milk from a woman’s breast. A baby is able to suck milk from the breast with the help of a sucking reflex and swallow once their mouth and throats are full aided by the proper development of the swallowing reflex. This process is facilitated by the anatomical and physiological features of the breast [11].

Anatomy of the breast and physiology of breastfeeding

I shall first briefly recapitulate on breast anatomy and the physiology of breast milk production. Breast milk is produced by the alveolar cells of the mammary glands. The alveoli open into the smallest branches of the milk-collecting ducts which unite to form the larger lactiferous ducts that converge on the areola to form the lactiferous sinuses serving as milk reservoirs. Each lactiferous sinus opens directly onto the surface of the nipple. Hormonal changes during pregnancy promote rapid growth of the mammary gland [11].

Breast milk production is facilitated by the neuroendocrine system. In humans, this process is entirely dependent on the concentration of prolactin (a peptide hormone produced by the anterior pituitary gland) in the maternal circulation. Release of prolactin is stimulated by suckling by a baby or mechanical stimulation of the nipple and surrounding tissues. The plasma concentration of prolactin depends on suckling frequency, which is the basis for recommending frequent breastfeeding in order to maintain adequate breast milk production. The milk ejection or milk let-down reflex is regulated by another peptide hormone, oxytocin, produced by the posterior pituitary gland. The milk ejection reflex can also be conditioned by other stimuli, such as a baby’s cry, and touching or seeing the baby [11].

Even with normal anatomy and physiology of the breast, women can still be unable to breastfeed successfully. The human species have been described as the only mammal in which breastfeeding is not entirely governed primarily by instinct, but is also a learned practice [12]. A woman's ability to breastfeed successfully may be influenced by several factors, some of which are endogenous while others may be environmentally induced. Some of these factors act as enhancers, whereas others may inhibit the successful practice of optimal breastfeeding [13-16].

What affects breast milk production

There have been myths about breast milk production; for example, eating certain foods has been said to increase or reduce breast milk production. However, reports have shown that the most important stimulant for breast milk production is frequent nipple stimulation through suckling by the baby and frequent breast emptying. Infrequent nipple stimulation, leaving breasts full for long periods and discomfort in the mother (pain, worry and doubt) can affect breast milk production [17].

Categories of breastfeeding practice

Infant feeding has been classified in various ways over the years, with a classical set of definitions being made by WHO in 1993 [4]. Important elements were repeated in 2001 [18]. These were: EBF, predominant breastfeeding, partial or mixed feeding, replacement feeding and complementary feeding. EBF was thus defined as feeding an infant with breast milk alone, without giving any other foods, not even water, except medicines, immunisations, vitamins and mineral supplements. Predominant breastfeeding refers to feeding an infant with breast milk, but in addition giving non-milk fluids (e.g. water, juices, herbs or tea), but with the infant deriving most of its energy-needs from breast milk. On the other hand, mixed feeding or partial breastfeeding refers to breastfeeding an infant while giving additional feeds like milk, gruel, or solids before the infant is 6 months old. Replacement feeding refers to feeding an infant of <6 months with milk other than breast milk, in conditions where a mother opts not to breastfeed. Complementary feeding refers to feeding infants with soft family foods simultaneously with breastfeeding after 6 months of age.

There has been concern over the obvious lack of a uniform terminology and strict definitions in relation to research on breastfeeding practices [19-24]. This is necessary if results comparisons between different studies in various settings are going to be meaningful and to come up with agreed recommendations to inform and guide policies. Since this thesis puts emphasis on supporting women to breastfeed exclusively, this type of breastfeeding needs further discussion.

Exclusive breastfeeding

In recent years, EBF has received more attention in view of its impact on infant survival in low income countries [2, 25, 26]. However, it is considered a strange concept not commonly practised in many cultures, even those that are generally sympathetic to breastfeeding [27-30]. The current WHO recommendation of EBF until 6 months of age was initially based on a report by an expert consultation group that showed breast milk alone could provide all the

nutrient requirements of infants up to 6 months, except when there were medically accepted reasons for using breast milk substitutes [18]. This was confirmed by later reports emphasising the adequacy of EBF in the first 6 months of life [5, 31]. It has been reported from observational studies that, even in hot climates, exclusive breastfed infants can maintain good hydration status [32-34]. Even in situations where infants were exposed to HIV, EBF was recommended if replacement feeding was not AFASS (Acceptable, Feasible, Affordable, Sustainable, Safe) [35], and it was recently recommended that infants should continue to breastfeed exclusively for 6 months while receiving prophylactic antiretroviral medicines [36].

The combined knowledge of benefits of EBF with its protection against mother-to-child transmission of HIV through breast milk compared to mixed feeding [37-39] strongly argues for increasing efforts towards promoting EBF. This is important in low resource and high HIV prevalence settings, especially in sub-Saharan Africa where alternatives to breastfeeding may not be so readily available, sustainable or even safe with regards to preparation and storage.

Benefits of exclusive breastfeeding

EBF is beneficial for both the baby and mother. Benefits for the baby may be observed in the short term during the period of EBF or later years in the child's life. The short term benefits include protection from infections, e.g. respiratory infections including pneumonia [40-44], otitis media [45, 46] and diarrhoeal diseases [47-51]. Some reports have highlighted the protective effect of EBF against pneumonia, especially in the first months of life [52, 53]. Although EBF reportedly reduced acute respiratory infection and diarrhoea deaths among infants in Dhaka slums, [25] this was not seen in the Belarus studies [54]. Preterm infants also benefit from EBF with a tendency of fewer episodes of upper respiratory infections in their first year of life [55]. Exclusively breastfed preterm babies were less likely to develop necrotising enterocolitis than their counterparts who were fed with formula exclusively or fed a mixture of formula and breast milk [56].

The results of a Cochrane review [5] on the optimal duration of EBF and its effects on child health, growth and development revealed no deficits in weight or length of infants who continued to exclusively breastfeed for 6 months. However, the authors suggested that bigger sample sizes would be required to identify small differences in the risk of undernutrition. They also highlighted the lack of uniformity in the definitions of EBF used in the studies that were reviewed.

EBF for the first 4 months prevents or delays atopic disease in infants [57]. In the long term, exclusively breastfed babies were reported to have reduced development of type 1 diabetes mellitus than in their peers with shorter duration of breastfeeding, along with an earlier exposure to cow milk and solid foods [58, 59]. It also reduced the risk of extreme obesity in children aged 39 to 42 months [60-64].

EBF tends to delay return of ovulation and post-partum menses in mothers, thus providing natural protection against further pregnancies [5, 65]. Frequent suckling by the baby

increases prolactin secretion, which in turn leads to increased breast milk production, but also suppresses ovulation. Indirectly the next pregnancy will be delayed, resulting in a better chance for the mother to recover [65-67]. The contraceptive role of EBF is especially important in areas where artificial contraception is not widely used for a variety of reasons. Despite programs promoting modern contraceptive use being in place since 1960, Uganda continues to have a low level of the use of contraceptives [68-71], and therefore EBF practice could benefit these women in terms of delaying further pregnancies.

Factors affecting exclusive breastfeeding practice

A number of factors can affect the successful implementation of EBF.

Socio-cultural influences

There are some cultural and practical obstacles to the practice of EBF. Of particular importance are those surrounding childbirth. Timely initiation of breastfeeding within 1 hour after birth may be delayed. Colostrum has been regarded as unclean and unsuitable for feeding babies, and prelacteal feeds are commonly given [27, 29, 30, 72-74].

Prelacteal feeds involve giving the baby other fluids and feeds before initiating breastfeeding. Various reasons for giving prelacteals include satisfying certain rituals, whereas others are given as a means of providing nourishment for the baby while waiting for the mother's milk to flow [14, 27, 29, 30, 73-75].

Prelacteal feeding may delay the establishment of breastfeeding and should not be encouraged unless medically indicated. Some women wait for their milk to "come in" before they put their babies to the breast, leading to their babies not learning to latch on to the breast early enough before the breasts become full. This delayed attachment of the baby to the breast also leads to inadequate emptying of breasts, and consequently to breast dysfunction, including engorgement and mastitis.

In some cultures, the common practice for women following delivery is to take a bath, rest and also bathe the baby before initiating breastfeeding [76, 77], a practice that already delays the initiation of breastfeeding. In other cultures, certain rituals that such as child naming have to be performed before a newborn is put to the breast. Since such rituals have to be performed by a specified person, this may prove a hindrance to early initiation of breastfeeding when the officiant is unavailable at the time of birth [78].

Traditional beliefs and attitudes influence breastfeeding practices in different settings [27, 73, 74, 79, 80]. In many cultures, mothers are supposed to give something in addition to the breast milk. Many of these cultures encourage the practice of giving extra water, herbs and "teas" to breastfeeding babies [29, 74, 76, 81]. For example, various studies report the notion that EBF is dangerous to the infant, thought to require water to quench thirst and promote normal development [82, 83].

Early introduction of complementary feeds is a common practice in many areas for different reasons. Many women perceive breast milk alone as not enough to cater for the baby's needs and so they introduce complementary feeds early [27, 73, 74, 84]. In Mbale, Eastern

Uganda, men and women reported that not introducing other feeds to babies in their early months is considered as the inability to provide for the family by the man. The participants in the FDGs strongly felt that babies needed some extra feeds in addition to breast milk [78].

In settings where mixed feeding for infants of less than 6 months is the norm, successful practice of EBF involves a change of behaviour by the mothers, the close family members and the community at large. However, influencing changes with regard to breastfeeding practices would require an in-depth understanding of why women behave in this way in order to give them appropriate guidance [85]. Some women have to return to work while others, especially the younger ones, have to return to school [86-88]. It is also important to understand the decision-making structures in place regarding infant feeding practices in a particular community in order to direct effort for changes in practices at the persons likely to effect the desired change [89].

Such practices need to be understood in the proper context when planning interventions for promoting EBF if they are to succeed. It is important to understand the prevailing local situation before planning and implementing a program or intervention for promoting EBF. Before setting up the peer counselling intervention described in this thesis, some formative studies were necessary to understand the infant feeding practices prevailing in the study area. From the results of these formative studies, EBF practice was not common [73, 79], and any intervention to increase the EBF level would require changes in both behaviour and practice.

Promoting the implementation of EBF requires involvement of all the stakeholders in infant feeding issues at the family level, in the wider community and among the health workers. A recent report showed that women residing in rural areas and those whose husbands supported breastfeeding were more likely to practice EBF [90]. In Bangladesh, the reasons identified for the failure of women to follow breastfeeding advice after discharge from the hospital included domineering grandmothers and husbands' interference [49]. In the same study, the advice was given to the mothers alone, without involving their family members or communities, which might explain the failure.

Healthcare facility practices

Some health facilities providing maternity services have routines whereby babies are separated from their mothers after childbirth. This practice has a negative effect on EBF as it delays initiation of breastfeeding and babies are likely to be given alternative feeds before being put to the breast for the first time. Further, some health workers may encourage giving prelacteal feeds to babies [74] with the intention of allowing the mothers an opportunity to rest after the stress of labour and childbirth or while waiting for their milk to "come in". Promoting the BFHI is important as it attempts to address these erroneous practices through its "Ten steps to successful breastfeeding" [91]. Some health facilities that have not embraced its recommendations may promote protocols for babies by advising mothers to feed their babies with it while waiting for their milk flow to be established.

Individual factors

Some biological factors concerning the mother or the baby may affect the success of EBF. Factors affecting the mother include sickness, mode of delivery (especially caesarean section), or occurrence of breast health problems during lactation. Other factors like non-smoking, non-working and multiparity of mothers can be positively related with EBF [90]. Furthermore, the mother needs to be confident in her ability to exclusively breastfeed her baby. Mothers who lacked confidence in their ability to continue breastfeeding beyond 2 months were more likely to discontinue breastfeeding within 2 weeks of childbirth [92]. Improved knowledge by mothers about benefits of EBF and how it can be accomplished should contribute positively to their performance.

Conditions affecting the baby, for example, some congenital abnormalities, sick baby or preterm births, can affect the baby's ability to suckle effectively [93]. These present a challenge for mothers of these babies who then need strong motivation and support to manage breastfeeding under these particularly difficult circumstances.

Some mothers may experience breast health problems during lactation, such as cracked nipples, engorgement, mastitis and breast abscess. These mothers tend to withhold the breast from the baby either due to pain or the belief that their breast milk is not good for the baby because of the breast health problem; as a consequence they give babies other feeds which disrupt EBF [12]. Some women with mastitis have reported rapid onset of physical illness and negative feelings, leading to some of them discontinuing breastfeeding altogether [94]. Most breast health problems experienced during lactation can be prevented through proper breastfeeding techniques that include proper attachment to the breast and promoting the complete emptying of breasts during feeds. Thus Practitioners working with breastfeeding women need to provide emotional support for those who experience mastitis, and also appreciate the difficulties they may face when starting to breast feed [94].

Strategies to increase exclusive breastfeeding

Several interventions supporting EBF have shown increase in EBF levels [7-9, 29, 95-106] suggesting that it is feasible when the mother is supported. These interventions can be categorised into 3 domains: global policies aimed at promoting, protecting and supporting breastfeeding, and health facility-based strategies and the community based approaches.

Global policies

WHO and UNICEF have played a significant role in encouraging government departments to promote breastfeeding. Worldwide, the breastfeeding culture had been eroded by changing trends towards commercial feeding, worsened by the aggressive marketing of breast milk substitutes in the 1960's and 70's. This resulted in increased numbers of children being exposed to contaminated feeds and poorly reconstituted formula feeds, leading to illnesses and poor growth, especially in low income countries with limited access to safe water.

At the 1978 Alma Ata international conference organised by WHO and UNICEF, the concept of primary health care (PHC) was strengthened. The Alma Ata Declaration highlighted promotion of proper nutrition and food security as key elements of PHC [107].

Promotion of breastfeeding was considered a way of providing proper nutrition for infants and young children. In 1980, the WHO/UNICEF GOBI-FFF campaign was launched and breastfeeding was promoted as one of the child survival strategies in low income countries.

In 1981, the WHA adopted the International Code of Marketing Breast Milk Substitutes and this Code was another global initiative aimed at protecting and promoting breastfeeding [108]. It is a set of recommendations put together with an aim of regulating the marketing of breast milk substitutes, feeding bottles and teats [109]. It was a result of concern that the health, growth and development of many infants were negatively affected by the poor feeding practices, compounded by the aggressive marketing of breast milk substitutes prevalent at the time. Adaptation of the Code by UN member countries is necessary to ensure that its provisions are effected at a national level. In Uganda the Code of marketing breast milk substitutes was first adapted in 1997 and has since been revised, but adoption of the revised version is not yet complete. Furthermore, monitoring and enforcing compliance with the Code remains the challenge.

The International Labour Organization (ILO) has put in place Maternity Protection Conventions (MPC): the MPC, 1919 (No.3), the MPC (Revised), 1952 (No.103), and The MPC, 2000 (No.183) and Recommendation No.191 which complements MPC No.183. These are meant to guide member countries in making appropriate maternity protection laws. The MPC No.183 covers different aspects of maternity protection: scope, health protection, maternity leave, leave in case of illness and complications, cash and medical benefits, employment protection and non-discrimination against breastfeeding mothers [110]. These Conventions should be implemented through laws and regulations put in place by the ILO member countries. Though few countries have ratified one or other of these conventions, all countries have been influenced to adopt some type of maternity protection legislation including Uganda which recently revised the duration of maternity leave from 45 calendar days to 60 working days.

In many countries, working women lack job security if absent from work for prolonged periods following childbirth due to lack of appropriate maternity protection laws. This forces many women to return early to work and end up introducing non-human milk feeds to their babies before six months of age hence interrupting exclusive breastfeeding [86, 111-113]. These feeds may not always be optimal or safe for these infants with regards to their preparation and storage. This is even more challenging to women employed in the private sector or those who are self employed where absence from work means no income.

However, strategies aimed at providing mothers with knowledge about introduction of other feeds, options to continue exclusive breastfeeding even when working away from home, addressing perceptions about insufficient breast milk and securing support from others helped women to breastfeed exclusively even after returning to their workplace [114]. Some workplace practices like provision of breastfeeding corners for nursing mothers, allowing them breastfeeding breaks can also support working mothers to breastfeed exclusively.

Other global efforts towards promoting breastfeeding included the 1990 Innocenti Declaration on the Protection, Promotion and Support of breastfeeding, the 1991 BFHI, with the WHO/UNICEF Global strategy for Infant and Young Child Feeding [115, 116] and

the 2005 Innocenti Declaration on Infant and Young Child Feeding. These efforts were a result of concerns that many children, especially in low resource countries, continued to suffer ill health associated with inappropriate feeding practices.

Health facility-based strategies

Providing health workers with extra skills in lactation management and later in breastfeeding counselling [4] improved their confidence and ability to support mothers to breastfeed. This was in response to the persistent inadequate infant feeding practices observed among women with young infants, with resultant poor health of the affected infants. The introduction of the Integrated Management of Childhood Illness (IMCI) strategy in 1996 by WHO and UNICEF also gave health workers extra skills for supporting mothers with young infants undertake successful breastfeeding [117].

Using health workers to support mothers to successfully practice exclusive breastfeeding has been successful in some areas [103, 118-120]. However, in Italy, giving women an early support visit by health professionals after discharge did not effectively lead to increased initiation and duration of breastfeeding [102]. In countries like Uganda, where the proportion of women giving birth in health units remains low [70, 71], many women may miss out on breastfeeding support provided at health units by trained health workers.

BFHI was introduced by WHO and UNICEF in the early 1990s as a way of promoting, protecting and supporting breastfeeding, starting in health units and continuing into the community. The implementation of BFHI revolves around the Ten Steps to Successful Breastfeeding [121]. BFHI strategy seems to work out well in supporting women to exclusively breastfeed [103, 122], especially where the majority of women readily seek care in health facilities and community support groups are established. In Brazil, with BFHI alone, high levels of initiation of breastfeeding were reported, but levels of exclusivity of breastfeeding rapidly fell after discharge from hospital [100]. The researchers thus recommended a combination of approaches and strategies to maintain high levels of EBF for longer periods [100]. This highlights the need to ensure that the community mother support groups are set up and operational, so that mothers can benefit from them after discharge from hospital. This becomes a challenge to successful BFHI implementation in areas where no organised community support groups are in place.

Community strategies

It is important to continue searching for alternative, affordable, acceptable and community relevant strategies to complement health units to improve EBF practices. A number of interventions have targeted the community in a bid to increase levels of breastfeeding. The use of mass media campaigns to disseminate messages promoting breastfeeding appears to lead to both improved levels of timely initiation as well as continued EBF [105]. This may prove useful for covering wide areas, especially where communities have access to the electronic media including radios. The peer counselling strategy has been used to promote the practice of EBF in some settings, as discussed below.

Peer counselling for exclusive breastfeeding promotion

One reported way of improving EBF levels is through support of breastfeeding mothers by peer counsellors [7, 9, 123]. The concept of peers has been applied in different settings, such as reproductive health and adolescent programmes, as well as in HIV care and support where peers have been used to share health messages with their colleagues in an informal way [124]. This approach provides an avenue for free discussion of issues considered sensitive, as well as providing some life skills to the beneficiaries. Most studies on the use of peer counsellors for EBF come from high income countries [8, 9, 123, 125-127], middle income countries [10, 103, 128] and low income settings in Asia [7, 47]. In Africa, lay counsellors for EBF support have been reported in South Africa, especially in relation to HIV infection and the mode of infant feeding [97].

Peer support interventions for EBF have been carried out in varying ways. Peer support programmes in high income countries have used telephone and face-to-face interaction between peer counsellors and beneficiaries [9, 10, 129, 130]. However, an evaluation of one of the peer counselling interventions where telephone contact was the main mode of communication showed that some mothers expressed a desire to have at least one face-to-face interaction with the peer counsellor [129]. Peer counselling interventions in India and Pakistan were based on face-to-face interaction with the beneficiary women [7, 47]. The number of visits in the different interventions also varied from 3 [10] to 15 [7] which makes the visit frequency a challenge in scaling-up the intervention. It would be useful to understand how the beneficiary women in an African setting would rate the peer counsellor intervention with regards to its packaging and mode of delivery.

Although peer counsellors are referred to by different names, including 'lay supporters,' 'peer supporters' or 'helpers' [104, 120, 129-134], their role has been similar, irrespective of the nomenclature. The attributes of the peer counsellors seem to play a role in the way they are received by the beneficiaries. In Bangladesh, the peer counsellors who were also school or religious teachers for children, or those who did sewing or handcraft at home, were more respected by the beneficiary mothers [135]. This finding may be setting-specific, but it raises the issue of acceptability of the peer counsellors by the beneficiary mothers and their families. It may be useful first to understand the social setting of the place where such an intervention is planned to be implemented. Implementation models aimed at cultures where infant feeding decisions are made on individual basis may need modifications from models aimed at cultures where decisions are made in groups, for example where the extended family has an influence on what the mother does. This was demonstrated in the Bangladesh study where the study team invited the influential family members to participate in the peer counselling sessions since they had a big influence on decisions made within the family [135].

In earlier studies done in high income settings, the beneficiary women were receptive to the peer counsellors and agreed to discuss breastfeeding issues with them [129, 130, 136]. In one study beneficiary women appreciated the peer counsellors for their non-didactic approach compared to health workers [96]. The question remains whether, peer counsellors would be easily accepted by their communities in the African setting as they live there, and whether they would more easily be approachable than health workers. It is also questioned

whether the mothers in the community would be more likely to identify with them and seek their help.

Identifying appropriate peer counsellors may pose a challenge. In most African settings, members of a community usually know each other. For the peer counsellors to be accepted by their communities it is questioned to what degree the community should be involved in their selection, the tasks they perform and information they give. It is also worth finding out to what extent this would create a sense of ownership of the peer counselling strategy by the community. It is also important that the selected peer counsellors have an interest in working with peers in their community. There is also need to consider selecting peer counsellors who are able to learn the information given during training in order to share it with their peers, while offering convincing explanations about different aspects of EBF. These issues were highlighted in an earlier study where mothers felt some peer counsellors were unable to convince them of the importance of some of the breastfeeding messages and therefore could not help them to fully overcome problems [135]. This highlights a need to strike a balance to ensure the peer counsellors needed by the community grasp the basic information and skills provided by the training.

Peer counsellors need to be trained in basic breastfeeding management and provided with skills in breastfeeding counselling. They also need to be coached on how to approach the mothers and share with them information about breastfeeding during the visits, including how to handle mothers and families that give them a poor reception. It is not clear what curriculum would be most appropriate for peer counsellors in the African setting, given the level of education in the majority of women and the social set-up. They also have to be followed up and provided with continuous support and education in order to maintain their acquired skills [135, 137]. The intensity of follow-up calls for a balance between what will lead to favourable outcome of the peer counselling intervention and what is realistic for scaling-up the intervention.

Motivation of the peer counsellors is essential for them to continue helping the mothers with breastfeeding. Earlier reports gave the following as motivators for the peer counsellors: acquisition of new knowledge, improved status in their communities, and continuous support by their supervisors [129, 130, 135, 137]. The question remains whether the motivating factors for women in a sub-Saharan African environment would be similar. It would be useful to establish the expectations of the peer counsellors regarding compensating them for their time and the form of their compensation. Paying the peer counsellors for their time might motivate them to do their work, but it may have cost implications regarding scale-up of the peer counselling at implementation level.

Studies that evaluated the impact of peer counselling interventions in high income settings showed that supported mothers appreciated their general or social support more than the practical or technical information received [96, 129, 130]. This finding suggests that peer counsellors provide more than just technical information, which will be crucial during the planning of a peer support program if it is to satisfy the needs of the beneficiary women. However, it remains to be seen whether the supported women in a sub-Saharan African setting would have similar sentiments.

Most studies on peer counsellors for EBF have reported increased levels of early initiation of breastfeeding and improved practice of EBF as a result of the intervention [7-10, 126, 137]. In Manila, the increase in EBF levels at 6 months following postnatal visits by breastfeeding counsellors was reported even in babies born preterm [138]. It was concluded that with extra support for EBF, even mothers with low birth weight babies can exclusively breastfeed. The peer counselling strategy has given positive outcomes even in areas with high HIV prevalence. In South Africa, using well trained lay counsellors to support breastfeeding mothers has led to increased EBF in both the HIV positive and negative mothers [97].

Recently a systematic review of randomized trials assessing effectiveness peer counselling in improving rates of breastfeeding initiation, duration and exclusivity was carried out. Peer counsellors improved rates of initiation, duration and exclusivity of breastfeeding [139]. A more recent review of breastfeeding promotion interventions reported a significant (6-fold) increase in EBF in developing countries; sub-group analyses showed that prenatal interventions had a significant effect on breastfeeding outcomes at 4-6 weeks, while counselling given both prenatally and postnatally significantly impacted on EBF at 6 months [140].

However, some reports found no significant difference in the levels of EBF in the peer-supported group and the control group [128]. It is critical to translate these positive research findings into successful routine practice by women in the communities and also learn from those interventions that did not seem to work when we are in the process of planning for scale-up of peer counselling in different communities, especially in low income settings. What is not clearly highlighted in the literature is a detailed description of the whole process of peer counselling from the selection of the peer counsellors through their training and supervision, and towards their acceptability of the intervention by mothers.

HIV/AIDS and breastfeeding

It is not possible to talk about breastfeeding in current times without considering HIV. The early reports that HIV could spread through breast milk from mother to infant, [141, 142] negated a lot of gains towards the promotion of breastfeeding and left many health workers confused about the messages to be passed on to the mothers. Uganda was not spared in this, as outlined under the Ugandan context.

The uncertainty about the safety of breastfeeding increases the power and influence of health workers on mothers as they act as gatekeepers to the new knowledge [143]. Due to fear of disclosure and stigma felt by HIV-infected mothers, some have ended up practising mixed breastfeeding for their babies in an effort to keep their HIV sero-status secret from their spouses and families [83, 144, 145]. Feelings of shame and stigmatisation because of their HIV status has affected the ability of some mothers to make informed infant-feeding choices [143]. The issue of whether, in reality, mothers in disadvantaged situations can make an informed infant-feeding choice has resulted in an ongoing debate. One could argue that promoting EBF rigorously for all women could work towards reducing stigma faced by HIV-infected women who opt to exclusively breastfeed. In Uganda, where many mothers

will continue to breastfeed in spite of the risk of HIV transmission through breast milk, EBF might lower this risk.

The picture is however slowly turning around, especially with the continued publication of research findings in favour of EBF as a viable and fairly safe option for feeding HIV-exposed infants [37-39, 146-148]. Similar findings have been reported in a rural Ugandan setting leading to the conclusion that use of formula feeding for HIV-exposed babies should be discouraged in similar settings [149]. The task remained how to help HIV-affected women to exclusively breastfeed, a practice that is not common in many communities in sub-Saharan Africa [30, 73, 74, 150, 151]. In a cross-sectional study in Mbale district, Uganda, the HIV-infected women had less favourable infant feeding practices compared to the HIV-negative ones with regards to giving prelacteal feeds, less EBF of infants under six months, and the early introduction of solids [79]. It is therefore important to continue trying out strategies to support mothers to exclusively breastfeed, considering that this is not a cultural norm in most areas of the world, including sub-Saharan Africa where HIV is prevalent.

Some concerns have been raised about the use of animal milk as a replacement in low resource settings, as it seems to have an inadequate content of essential fatty acids [35]. This had led to the recommendation that where modified animal milk must be used as a replacement feed, oil (preferably soy oil) should be added to the baby's diet [35]. Furthermore, a number of barriers to safe replacement feeding, e.g. high cost of replacement feeds and fuel for preparation, poor access to safe water and storage facilities, are rife in sub-Saharan Africa [152]. Finding a viable method of supporting EBF would help solve some of these challenges.

The aspect of EBF and HIV transmission may become less important following the 2009 WHO rapid advice [36] and the current guidelines [153] suggesting protection of the infant during breastfeeding by either maternal treatment with HAART or infant prophylaxis with daily oral nevirapine throughout the breastfeeding period. With this prophylaxis, the advice is that the infant should exclusively be breastfed for 6 months, preferably continuing until 12 months. The challenge remains as to how soon low resource countries can adopt this recommendation and implement it.

The WHO recommendations on infant feeding in the context of HIV/AIDS have been constantly changing depending on new research findings regarding HIV/AIDS and breastfeeding. These have led at times to changing policy recommendations even before health workers as end users have internalised existing ones. While some health workers were still trying to put in practice the 2006 revised recommendations stressing the concept of 'when replacement feeding is AFASS', new recommendations were released in 2009 [154]. In the 2009 rapid advice and 2010 recommendations [153], WHO is encouraging national health authorities to identify the most appropriate infant feeding practice (either breastfeeding with ARVs or the use of infant formula) for their communities. They are advised to promote the selected practice as the single standard of care. This may prove easier to follow, since some health workers and counsellors have been advising mothers on which feeding option to use rather than counselling them on options open to them from which mothers are expected to make an informed choice [83, 155-157].

The Ugandan context

The Government of Uganda has embraced some initiatives to protect, promote, and support breastfeeding. These include, the Code of marketing breast milk substitutes, the BFHI, Integrated management of childhood illness strategy, policy on infant and young child feeding and training of health workers in the context of HIV. In 1997, Uganda adapted the Code of Marketing Breast Milk Substitutes that is catered for under the Foods and Drugs marketing of baby foods Act of 1997. However, the main challenge is ensuring its efficient enforcement and monitoring so that all the parties concerned operate within the framework of the Code.

The BFHI approach was also launched in Uganda in 1994; up to 11 health units managed to achieve Baby Friendly status. However, with the HIV/AIDS pandemic and initial lack of appropriate guidance on how to prevent infection from mothers to babies, even these few health units lost their Baby Friendly Hospital status in the confusion that ensued after reports that mothers could pass HIV to their infants through breast milk. In recent years, the trend is changing, with more health units working towards becoming Baby Friendly, such that 15 health units achieved Baby Friendly status in 2006. Currently, 226 health units are working towards this status.

More efforts have been directed at health workers working in maternity and postnatal units, who were identified and trained in breastfeeding counselling based on the WHO breastfeeding counselling course [4]. Increasing evidence that HIV could spread from mother to infant through breast milk led to the addition of HIV and infant feeding information to form an integrated training on infant and young child feeding counselling course. This training has been targeting health workers already working and interacting with mothers during antenatal care, delivery and the postnatal period. However, training health workers already in-service may not create a sufficient pool of health workers to have a lasting effect. The question remains whether this strategy would cover more health workers if this training was included in the pre-service curriculum in greater detail as well as covering those already in service. However, the challenge is how much can be added to the already time-constrained pre-service curriculum without extending the duration of the courses.

The introduction of the Prevention of Mother to Child Transmission of HIV (PMTCT) programme in Uganda involved training some health workers as infant feeding counsellors. These counsellors provide information to mothers regarding infant feeding options for HIV-positive mothers based on the current WHO recommendations adapted to suit the local situation. These efforts have been concentrated in health units with minimal community-based efforts.

An Infant and young child feeding policy in the context of HIV has been put in place. The task is to translate the policy guidelines into practice by the health workers who interact with mothers and children. Despite these strategies being in place, the level of EBF reported in community studies has remained low [30, 73, 150, 151, 158]. The practice of giving newborn babies prelacteal feeds seems to be common [30, 73, 151]. These were mainly cross-sectional surveys using the “since birth” recall, 7 day recall or 24 hour recall.

In Uganda, almost all babies are breastfed at some time, although EBF is not commonly practised. In addition to prelacteal use, supplementary feeds are given quite early in life, leading to mixed feeding [71, 73, 150, 151]. These practices disrupt the WHO recommended practice of EBF for the first 6 months of life, which had been adopted as policy at the national level.

Over the years, the Uganda Demographic and Health survey reports have shown EBF levels for infants aged 4 to 5 months to be 34- 36% [69-71]. The same reports have highlighted mixed feeding as a common practice, with supplementary and complementary feeds being introduced as early as 2 months of age [69-71]. This state of affairs presents a dilemma in a country with a high prevalence of HIV infection in view of what is currently known about mother to child transmission of HIV through breast milk. The situation is made more complicated by the high fertility levels and small proportion of women delivering their babies in health units where the services for preventing mother to child transmission of HIV are concentrated. This is especially common in rural areas where the majority of the population reside [159]. This leads to women missing out on the infant feeding counselling services offered at the health units.

Considering the foregone discussion, it is important to establish ways of helping women to exclusively breastfeed their infants, given reports that EBF is a safer mode of feeding than mixed feeding with regards to HIV transmission through breast milk [37-39, 147, 149]. This implies many of the women delivering outside of the health units miss out on the strategies aimed at supporting them with appropriate infant feeding practices, including EBF. Because of this, strategies targeting women at the community level are likely to benefit more women in Uganda.

Theoretical frameworks

This thesis focuses on the set up of an intervention based on peer counselling that aims to improve EBF in a sub-Saharan African context. Although, the usefulness of a theory to inform and guide health behaviour interventions has been recognized [160], the intervention trial presented here was not planned and implemented using theory in a strict sense. Nevertheless, Intervention Mapping (IM) and Social Cognitive Theory (SCT) have been considered relevant theoretical frameworks for a retrospective description of the choice of intervention strategies and tools. First, I will briefly describe what IM and SCT are about. Second, I will discuss how those theoretical frameworks relate to the intervention study presented in this thesis.

Intervention Mapping (IM)

IM is a protocol for systematically developing and implementing interventions based on theories and empirical evidence [160]. It facilitates the planning of user-relevant interventions by identifying factors that are related to the desired behavioural outcomes. Further, it helps one to plan, step-by-step, how to carry out the intervention and eventually execute the plan (figure 1). Despite being presented as a series of steps, the process is iterative and the person planning the intervention has the flexibility of going back to earlier steps as he or she learns and gains experience [161]. IM has been extensively used to

develop health promotion programs by linking health behaviour determinants and performance objectives with specific theoretically derived intervention methods and practical strategies [161].

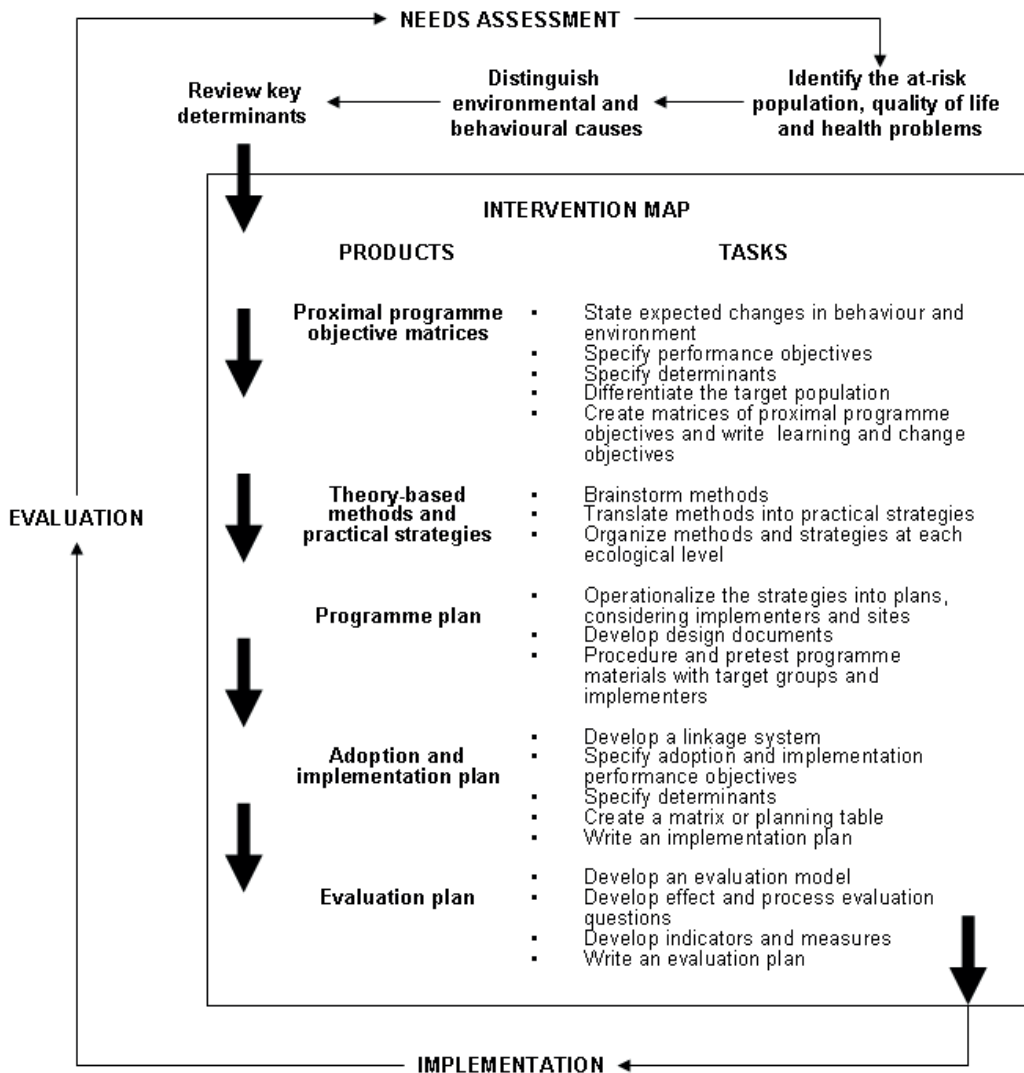


Figure 1: Intervention Mapping by Kok et al., 2004.

Three core processes have been described within IM, namely, searching for relevant literature, accessing and using theory as well as collecting new data [161] and noting the IM framework's 5 steps [160, 161]. In step 1, the programme objectives (i.e. performance and learning objectives) are defined. These objectives spell out what individuals need to learn, as well as who and what will change as a result of the intervention. The performance objectives are the behaviour patterns that need to be taught to achieve the overall aim of the intervention, whereas learning objectives are the individual and environmental behavioural

determinants, i.e. the determinants of the performance objectives. In step 2, theoretical foundations help select educational strategies and methods that match the learning objectives. Examples of these include; community empowerment, modelling, skill development, persuasive communication and social support. The goal of this step is to list intervention methods that are matched to performance and learning objectives, as well as and thinking of ways (strategies) to deliver these methods to the target group in a practical manner. Step 3 involves making an organised programme that is acceptable to both the implementers and the participants. Step 4 deals with developing a plan to implement the program, and Step 5 assists in producing an evaluation plan. Evaluation should consider both the process and effects of the intervention. Hence with IM, it is possible to determine to what extent the decisions, assumptions and expectations have been realised.

Social Cognitive Theory (SCT)

Bandura's Social cognitive Theory (SCT) builds on its precursor, the Social learning theory which proposes that people can learn new information and behaviour by observing the behaviour of others. According to SCT, behavioural determinants are grouped into 4 categories: self efficacy, outcome expectations, socio-structural factors, and goals [162, 163]. It is assumed that self-efficacy, outcome expectations and socio-cultural factors interact to influence the goals and eventually behaviour. In addition, self-efficacy is postulated to have a direct effect on behaviour [163]. SCT has been applied in studies on sexual and reproductive health behaviour in both Western and non-Western settings [164-167].

Outcome expectations within SCT may be physical, social or self-evaluative. They are positive and negative consequences one may anticipate following performance of a particular behaviour. Some physical outcome expectations are positive, e.g. pleasure, and might thus act as incentives for performing a particular kind of behaviour. On the other hand, negative physical outcomes (e.g. pain) are likely to discourage performing a particular behaviour. The social outcome expectations (norms) are the social reactions evoked by behavioural performance. One tends to anticipate what will happen in the environment as a result of performing certain behaviour, or how others will approve or disapprove the behaviour performed. If a particular behaviour fulfils the expected social norms, it reveals positive social reactions, whereas behaviour which contradicts the social norms might be censured. When one conforms to these standards of behaviour, the action leads to a self-regulatory system which works through self-sanctions. Another group of outcome expectations that may affect behaviour is the self-evaluative ones. People will evaluate their own behaviour and they will behave in a way that will give them feelings of self-satisfaction and self-worth.

The socio-structural factors within SCT are grouped as facilitators and impediments. The facilitators include those factors in the social set-up or environment that will encourage behavioural performance. An example of socio-cultural facilitating factors for EBF is if a breastfeeding mother has family members who support her attempts to exclusively breastfeed or has other family members taking over some of her daily chores so that she can dedicate more time to exclusively breastfeed her baby. The media messages a mother is exposed to may also act as facilitators if they are supportive of EBF. The woman's workplace is another example that can act as a facilitator if it has policies in place that are

friendly to breastfeeding. Impediments or barriers might be personal and socio-structural factors that discourage correct behaviour. For instance, negative messages through mass media and aggressive marketing of breast milk substitutes can discourage women from practising EBF. Some cultural beliefs and practices that encourage giving extra feeds in addition to breast milk to babies and those that consider exposure of breasts while breastfeeding unacceptable are other examples of barriers that may negatively affect EBF.

Self-efficacy may be one of the main predictors of behaviour according to the SCT and other social cognition models. Bandura [168] suggested that people's beliefs in their personal efficacy can be developed and changed by 4 main sources of experiences. These are mastery experiences, experiences provided by social models, social persuasion and reduction of stress reactions. The experience gained through this process helps to improve one's confidence in their ability to overcome obstacles. It is argued in the SCT that success helps to improve one's efficacy while failure may instead undermine it [168]. Seeing others like them succeeding helps to strengthen people's convictions about their own ability to succeed in behaving in a particular way. Competent models can therefore help those who observe them to develop skills needed to meet the demands in their environment. Increase in self-efficacy or boosting confidence in the ability to perform a particular behaviour through social persuasion might occur when people are constantly told that they have the capability to do it. Improving people's self-efficacy through stress reduction might occur by targeting people when they are in a positive mood when they feel more confident in their ability to perform certain behaviour. Perceived self-efficacy is taken as a key factor since it operates directly on motivation and action, and also through its effect on the other determinants [168].

Use of Intervention Mapping

The intervention study presented in this thesis relates to the first 3 steps and to some extent to step 5 of IM. Step 1 of IM defined the performance objectives in terms of measurable behaviour that the intervention intended to develop or change in relation to lay women counselling for EBF among their peers, and for EBF by mothers. This step also specified learning objectives in terms of individual and environmental determinants of EBF. These determinants were derived from SCT and other social-cognition models (for example, The theory of planned behaviour) and from literature reviews, and included knowledge about EBF, understanding its importance as well as acquiring skills necessary for its performance. Individual determinants of EBF comprised mode of delivery, perceived vulnerability of lactation breast problems, perceived approval or disapproval from significant others, and self-efficacy related to EBF.

Environmental socio-cultural determinants of EBF included feeding babies with prelacteal feeds and discarding colostrum [30, 73, 151], health facility practices like the bathing of babies and mothers before commencing breastfeeding, separation of babies from mothers after delivery, use of formula milk while waiting for the mother's breast milk to start flowing, lack of adaptation and monitoring of the Code of marketing breast milk substitutes, and unsupportive workplace policies towards breastfeeding [30, 73, 151]. Thus, the learning objectives specified were intended to answer the questions: "What knowledge and skills about exclusive breastfeeding do lay women need in order to counsel their peers on that

behaviour?” and “What do the mothers need to learn about determinants of EBF in order to accomplish that behaviour?”

Based on contemporary knowledge and literature reviews, it has been recognized that socio-structural factors might positively or negatively affect EBF [14, 49, 73]. Prelacteal feeds, commonly used in parts of Uganda, including the study area [30, 73, 82, 150, 151], were provided for various reasons, such as cleaning the baby’s throat, and they could act as impediments to EBF. The fear to feed newborn babies with colostrum is another example of a negative aspect that could act as an impediment to EBF practice. Furthermore, the practice of mixed feeding is common in Uganda [30, 73, 150, 151]. Many babies were given other feeds before the age of 6 months, a practice that disrupts EBF and hence another impediment to its practice.

In a study in the same area, it was found that all mothers were expected to breastfeed their babies unless they had serious illnesses, including mental illness, and this was echoed by the women and men alike [78]. Women who did not breastfeed their babies were considered to be “not good mothers”. However, in the same study, the concept of EBF was considered a sign of poverty since it signified that the man was not able to afford other feeds to give to the baby in addition to breast milk [78]. These scenarios reflect the concept of self-evaluation suggested in the SCT [169].

In step 2 of IM, the methods identified to change key determinants of EBF can be described using Bandura’s categories including: the provision of information about EBF or knowledge transfer, guided practice, skill demonstration, social persuasion, mastery experiences, skill training with guided practice and feedback, self-monitoring, modelling and changing community environment [162]. The theoretical methods were then translated into practical strategies for both performance objectives.

With regard to the performance objective of lay women performing counselling of their peers in EBF, the strategies used included: imparting to them skills about EBF, for example, how to help a woman to effectively position her baby on the breast and how to express breast milk to feed the baby when the mother has to be away for some time, return to work or if she has breast problems like engorgement. They were also taught counselling skills to use during their interaction with mothers, for example, listening to the mothers during counselling sessions and giving them confidence about their ability to exclusively breastfeed, as well as giving them appropriate information about breastfeeding. The peer counsellors visited the women in their homes to provide a conducive environment for helping the women practice the skills related to EBF, and made the intervention responsive to individual women’s needs. This also provided an avenue for peer counsellors to answer emerging women’s concerns with regard to EBF. During their visits, the peer counsellors acted as models for the women.

Peer counsellors acting as models were selected by the women themselves on the basis of trust and respect. These attributes further reinforced their role modelling position. The training in EBF knowledge and skills that the peer counsellors acquired further improved their status as models for their peers. In addition, social persuasion was used to increase women’s self efficacy and knowledge through multiple verbal sessions. During the peer

counselling visits important messages regarding EBF were repeated and the women were reassured of their being able to exclusively breastfeed their babies. This has been described as another way of strengthening people's confidence to succeed in practicing the desired behaviour [168]. The peer counsellors were equipped with counselling skills so that they could use them to reduce stress in the women who were in stressful situations related to their breastfeeding experience. This is possible for a first-time mother who may be facing difficulties in breastfeeding or generally caring for her baby, especially if she is unable to get support from her family. Reducing stress is beneficial since a positive mood enhances self-efficacy [168].

In relation to the performance objective of exclusive breastfeeding practice by the mothers, the information related to the usefulness of feeding babies with colostrum, initiating breastfeeding within one hour of birth, avoiding prelacteal feeds for the newly born babies and expressing breast milk in different situations to feed the baby. The women were also given information about the advantages of breast milk over formula milk in an effort to counter the effects of the marketing of breast milk substitutes. The methods identified aimed at creating positive norms for EBF, increasing women's awareness and knowledge, and strengthening their beliefs that they were able to perform EBF, and hence improving their self-efficacy. The strategies included use of trained peer counsellors to empower mothers through the sharing and transferring of knowledge about EBF.

In addition, social persuasion was used to increase women's self efficacy and knowledge through multiple verbal sessions. During these verbal sessions important messages regarding exclusive breastfeeding were repeated and the women were reassured of their being able to exclusively breastfeed their babies. This has been described as another way of strengthening people's confidence to succeed in practicing the desired behaviour [168].

In step 3, involving designing and organising the program, the following were done; community entry and involvement, selection of peer counsellors, training and continuous support supervision of the peer counsellors. Community participation was deemed essential at this stage. The community leaders, as gate-keepers, were first engaged in discussions about the intervention. These leaders mobilised the women in their communities for meetings where the intervention was discussed. The women were actively involved in the process of selecting the ones to train as peer counsellors, hence the participatory approach. Whereas the plan was to involve women in the reproductive age group in the selection of peer counsellors, this criterion was adapted to include grandmothers and other women who showed interest, influence and good understanding of their areas. Adaptation of the intervention also made it acceptable. The selected women were then given training where knowledge and skills about EBF were imparted. In addition to the knowledge about EBF, they were also given skills concerning the approach to use when sharing this acquired knowledge. This was to empower them to share the acquired knowledge with their peers back in their communities.

The peer counsellors were given a pre-test before the training to explore their knowledge gaps and a post-test immediately after the training to assess their knowledge acquisition from the training. The identified gaps in knowledge about EBF were filled by further discussions. Following training, the peer counsellors were given continuous support through

visits by the supervisory team. Follow-up discussions and supervision visits were opportunities to reinforce knowledge and skills regarding EBF among the peer counsellors.

Step 5 of IM deals with evaluation of the intervention. This should ideally involve evaluation of both the process and the effect of the intervention. In this thesis, focus is on the evaluation of the process, one part of step 5. This thesis used both the perspectives of the peers and the supported women to understand how they rated the peer counselling. The effect of the intervention was assessed in a formal way in the PROMISE-EBF trial and a published paper appears in the Appendix. Although it is not part of this thesis, it will be briefly discussed since it provides background for the sub-studies in this thesis.

Mixed methods

Mixed methods research is a relatively new approach to research methodology and is still subject to discussion. Mixed methods research is an approach where both quantitative (quan) and qualitative (qual) data are collected, analysed and interpreted in a single study or series of studies that seek to investigate the same underlying phenomenon [170, 171]. This approach recognises both quantitative and qualitative research as important and useful [172]. There have been some unresolved issues and controversies in the use of mixed methods in the social and behavioural sciences. However, over recent years, more scholars agree that it is possible to use both methodologies in the same study depending on the nature of the research questions to be answered [173]. The goal of mixed methods research is not to replace either qualitative or quantitative approach, but rather to draw from the strengths and minimize the weaknesses of each [172].

Mixing can take place at any stage in the research phase, from design to interpretation, and mixing is needed at least at one stage in the research process to qualify as a ‘mixed method’ study [174]. Mixing should be planned in the design phase and appropriate data collection should be chosen according to question to be answered. For example, qualitative work can inform quantitative data collection and qualitative work can shed light on unresolved quantitative findings. Quantitative and qualitative data collection and analysis can take place either in parallel or sequential phases and will thereby have the potential to inform or not inform each other [175].

When planning a mixed methods study, there are extra steps that are taken in addition to deciding the purpose of the study, research questions and type of data to be collected [175]. One step is to decide which theory the study is based on and choose the applicable methodologies. Second, a decision has to be taken on how data collection will be done and prioritised with respect to the qualitative and quantitative components. When these components are both given equal emphasis; this is referred to as equal priority in contrast to unequal priority where one component is given more emphasis than the other [176]. Last, the researcher has to decide at what stage the data analysis and integration will be done; that person may have to analyse the qualitative and quantitative data separately, and may then compare and contrast them in the discussion. Another alternative would be to connect the data analyses [175].

A system for describing different mixed method procedures has been described [177]. This system uses plus (+) symbols and arrows (→), as well as lower and upper case letters, to denote the sequence of doing and the priority given to the qualitative and quantitative components of the study, as explained in Table 1. I will apply standard notations outlined in this table to describe how I used mixed methods under the methods section.

Table 1: Notation used in mixed methods research

Notation	Explanation
Qual	Short form for qualitative methodology
Quan	Short form for quantitative methodology
QUAL	Word capitalised to imply a dominant component
QUAN	Word capitalised to imply a dominant component
+	Symbolises methodologies done together
→	Symbolises methodologies done sequentially
QUAL + QUAN	Both methodologies are equal in strength in a study
QUAN + qual	QUAN is dominant over qual in a study

The results can be reported either in a segregated or integrated manner. If mixing is done transparently, one can easily look at the study backwards and understand how the mixing was done. Furthermore, in addition to discussing quantitative and qualitative design issues, mixing should also be discussed in an appropriate mixed study. Considerations about the mixing of methodologies relevant for this thesis are given in the discussion section of this summary.

Justification for the studies

In sub-Saharan Africa, the culture of breastfeeding has remained strong, but EBF is rarely practised for a variety of reasons. Many women think breast milk alone is insufficient to cater for the baby’s nutritional requirements, so they introduce other feeds early. In Mbale, Eastern Uganda, both men and women felt that babies needed extra feeds in addition to breast milk and not introducing them to babies in their early months was due to inability of the husband to provide for the family [78]. Early introduction of complementary foods by exposing the babies to nutritionally inappropriate and unhygienic foods may present a health risk.

Sub-Saharan Africa has a high prevalence of HIV infection with the resultant spread of infection from the mother-to-infant through breastfeeding. Uganda, one of the sub-Saharan countries that have grappled with high rates of HIV infection among pregnant women, has been implementing the PMTCT programme over the last decade. In view of the current major challenge, this study was initiated to find an affordable and safe method of feeding

HIV-exposed offspring that could be used for all the babies as this would make it easier for the health workers to provide appropriate support. The increasing reports of the safety of EBF over mixed breastfeeding with regards to HIV spread from mother-to-infant through breast milk called for strategies to assist exclusive breastfeeding. Since almost all women in Uganda initiate breastfeeding, the emphasis should be put on helping all mothers to exclusively breastfeed, avoiding prelacteal feeds and initiating breastfeeding within the first hour of birth. This would have the added advantage of reducing the stigma of mothers who were HIV-positive, since they would not be easily identified by their choice of feeding method.

Where peer counselling for EBF has been implemented, there has been improvement in the levels of EBF. Limited research regarding peer counselling for EBF was reported from Africa by the time of the study; to our knowledge, no reports have come from Uganda. The concept of peer counselling, new to sub-Saharan African setting, raised questions regarding its feasibility and acceptability. The question of whether rural women with modest formal education could be trained to support their peers in exclusively breastfeed using simple counselling skills required elaboration. Moreover, the attitudes of the women and the community at large towards the peer counselling strategy had to be better understood.

Most of the reported studies on peer counselling have not elaborated on the process of setting up a strategy. The few that have attempted this do not reflect the unique sub-Saharan setting. This thesis will therefore offer more detail regarding the process of setting up a peer counselling strategy in Africa and highlight some challenges that policy makers and programme managers will anticipate in the planning of similar interventions.

It is important to understand how the beneficiary women regard peer counselling, since this was a new approach. These findings will provide insight concerning how the beneficiaries felt about peer counselling intervention aimed at helping them change their behaviour regarding EBF.

Aims and objectives

The current work was carried out within the PROMISE-EBF trial, a multi-centre cluster randomised behavioural intervention trial. The primary outcomes of the trial have been reported elsewhere and will be briefly summarised here as a background to the 3 papers that comprise this thesis.

Aims of this thesis

The aims were to document and explore the experiences of setting up a community-based individual peer counselling intervention for support of EBF in the Uganda site of the PROMISE-EBF trial, and assess its effect on mothers who opted to breastfeed.

Specific objectives

1. To assess the feasibility and acceptability of training community women as peer counsellors for exclusive breastfeeding in rural Iganga district. Paper I
2. To describe the experience of establishing individual peer counselling including training and retaining peer counsellors for exclusive breastfeeding in the Uganda site of the PROMISE-EBF trial, Mbale district. Paper II
3. To describe the experiences of the supported mothers towards individual peer counselling for exclusive breastfeeding in an African setting. Paper III

Study subjects and methods

A summary of the methods is presented here.

Study setting

Uganda is a small country of 234,060 square kilometres, but well endowed with very many ethnicities and languages (Figure 2). It currently has 112 administrative districts, with each district being divided into counties, sub-counties, parishes and villages. Each of these smaller divisions is led by an elected local council. The head official in a district is the chairperson of local council five (LCV), while the village is headed by an elected chairperson of local council one (LC 1).



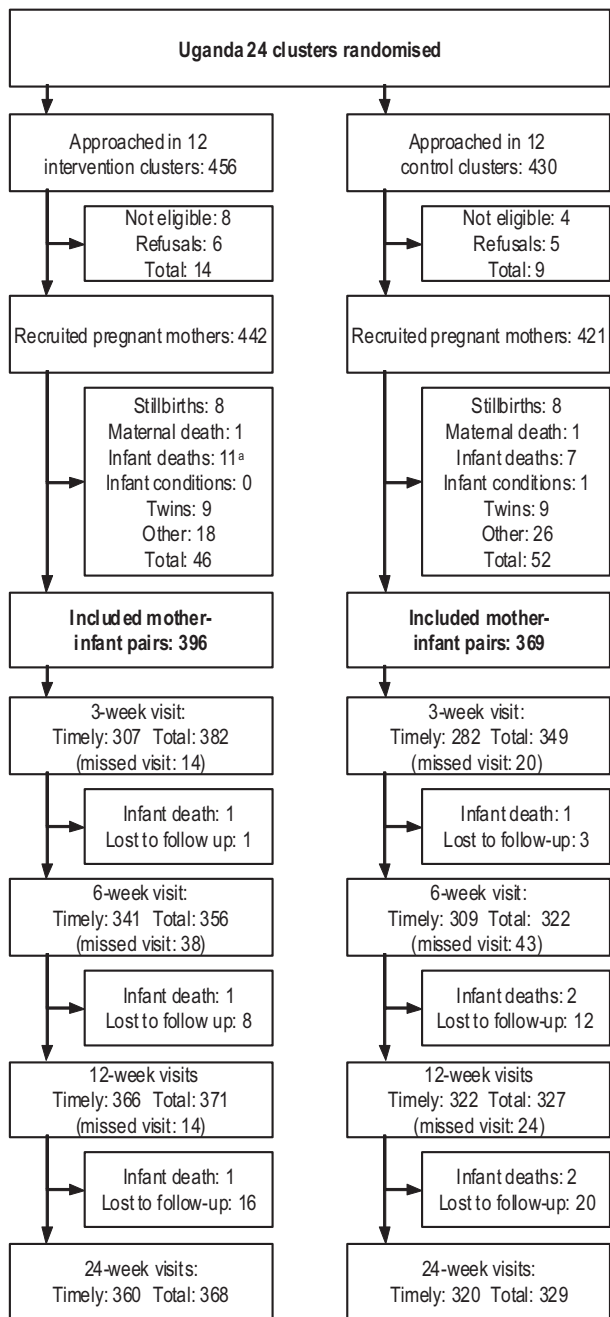
Figure 2: Map of Uganda showing Mbale (blue, to the right) and Iganga (red) districts.

This thesis is based on work done in 2 eastern districts of Uganda, namely Iganga and Mbale. Mbale is a small district currently comprised of 2 counties, whereas Iganga is divided into 3 counties. To assess the acceptability and feasibility of using community women as peer counsellors for EBF, a pilot was done in Ibulanku sub-County of the Iganga district in eastern Uganda from February to June 2004. Iganga district was selected to avoid influencing the Mbale district with peer counselling before the main study. Ibulanku sub-County is located on the Kampala-Nairobi highway, 200 km east of Kampala. The sub-County is divided into 10 administrative units called parishes with a population of 38,000, of whom about 3700 were women of reproductive age [70]. The people of Ibulanku are

Box 1: Outline of the PROMISE-EBF trial.

PROMISE-EBF trial

- Multi-centre cluster-randomised trial in 4 African countries: Burkina Faso, Uganda, Zambia and South Africa.
- Primary objective of assessing the effect of individual home-based peer counselling for support of EBF on rates of EBF at 3 months of the infant's age.
- During mapping of the study site, clusters were selected depending on their accessibility by road since multiple home visits had to be made to the mothers throughout the study period. This was done to minimise chances of loss to follow-up due to failure to access some homes during the rainy season.
- Clusters were randomised into 12-17 for intervention and 12-17 for control, >800 mother-infant pairs per country. Uganda site had 12 clusters for intervention and 12 for control.
- The clusters in Uganda were stratified into urban and rural. Half of the clusters in each stratum were randomised to intervention of peer counselling, and the other half served as a control (Figure 4).
- Eligibility criteria: all pregnant women residing in and intending to continue living in the study areas who consented to participate. After delivery, mother-infant pairs were excluded if: Infants had severe illness or abnormality preventing breastfeeding, stillbirth, twin delivery, infant death or maternal death. The numbers enrolled are presented in figure 5.
- Peer counsellors were defined as women from a community with similar characteristics and background to that of the women they were trained to support in EBF.
- Intervention comprised a minimum of 5 peer counselling visits: during pregnancy ~7 months, and the 1st, 4th, 7th and 10th week after childbirth (Figure 6).
- Mothers in the control clusters received standard care, mainly health promotion messages during antenatal care visits.
- Data were collected by independent interviewers between 2006 and 2008 during 5 data collection home visits: at recruitment (during pregnancy), the 3rd, 6th, 12th and 24th week after childbirth. Data on feeding patterns, infant morbidity, anthropometry and survival were collected at these visits.
- Data collectors were blinded to the allocation of the clusters and efforts were made not to tell them which clusters received intervention.



•Text:: ^a Infant and maternal death combined

Figure 5: Trial profile for the Uganda site of PROMISE-EBF.

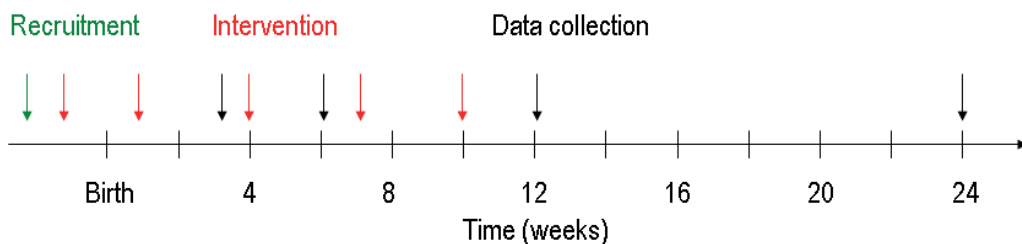


Figure 6: Intervention and data collection planned visits during the PROMISE-EBF trial: 1 recruitment visit (green), 5 intervention visits (red) and 4 postnatal data collection visits (black).

Outcome of the trial

The prevalence of EBF at 12 weeks of age in the intervention clusters was approximately twice that in the control clusters, using both the 24-hour and 7-day recall (Table 2). At 24 weeks of age, the prevalence of EBF had reduced in both groups, but it remained higher in the intervention than the control group (Table 2 and Appendix iv).

Table 2: Prevalence of EBF at 12 and 24 weeks of infant age.

	Intervention n/N (%)	Control n/N (%)	PR	95% CI
12 weeks of infant age				
EBF 24 hour recall	323/396 (81.6)	161/369 (43.6)	1.89	1.70 - 2.11
24 weeks of infant age				
EBF 24 hour recall	232/396 (58.6)	57/369 (15.5)	3.83	2.97-4.95

Peer counselling intervention

The sub-studies comprising this thesis were based on the peer counselling intervention for EBF. A detailed description of the peer counselling intervention has been made in Paper II and it will be briefly described here.

In the Uganda site of PROMISE-EBF, the intervention of peer counselling for EBF was set up in 12 clusters, 9 rural and 3 urban, each with an estimated population of about 1000 inhabitants, expected to provide 35 babies in a year given a birth rate of 3.5%. Each rural cluster consisted of one to three villages combined, depending on the village population size. One rural cluster comprised three villages because of the sparse population. Two of the three urban clusters comprised densely-populated non-formal settlement areas of Mbale Municipality and these covered a smaller area.

After randomising the clusters to the peer counselling we invited the village local council chairpersons of the 12 clusters for a meeting in Mbale town and discussed with them the planned study. Each of the leaders subsequently organized for us a meeting with women in

their respective villages, making a total of twelve meetings. At these meetings the women were sensitized to the study and requested to select one of their number to be trained as peer counsellor for breastfeeding which they did. We selected a total of 12 women one from each of the designated clusters, for training as peer counsellors for EBF for the PROMISE-EBF trial.

These women had to be aged between 18 and 45 years, resident in the study area with no plans of leaving the area within two years. They also had to be literate and numerate in the local language, willing to participate in the study including a one-week residential training and to undertake home visits in order to support their peers with breastfeeding. Those who were unable to attend the training were excluded.

We trained the twelve selected women for 6 days using simplified materials based on the WHO Breastfeeding Counselling course (WHO and UNICEF, 1993) with a focus on EBF and simple counselling skills. The methods used in the training included lectures, small group discussions, plenary discussions, role plays and hands-on practice with mothers who had just delivered at Mbale Regional Referral Hospital. The gaps identified in their knowledge and skills were addressed by the study team to ensure improvement in their skills.

In addition to counselling training, the procedures of the study were also taught; namely, how to complete the peer counsellor visit forms and to record information at each visit. The proper timing of peer counsellor visits and the key messages to share with the mothers during different visits were emphasized. All twelve peer counsellors completed the training and started supporting mothers in their villages with breastfeeding throughout the study period.

By way of assessment of impact of training on the peer counsellors they were given a pre- and post-test. This was done to assess their knowledge and attitudes towards EBF before and after training. The problem areas highlighted by the pre- and post-test were given due emphasis during the training and follow-up. During the training, the women's participation in training activities was observed and their understanding of the course content was continuously assessed during different sessions and they were given feedback.

It was agreed with the peer counsellors to counsel and support all pregnant mothers identified within their villages in order for all of them to benefit from the intervention. This was done to avoid mistrust among some women who had to be excluded from the PROMISE-EBF trial. They were to visit each mother at least five times, the first visit occurring when a mother was about seven months pregnant. The remaining visits were made during the 1st, 4th, 7th and 10th week after delivery. The key messages emphasized during the different visits are highlighted in Paper III. In case a mother requested for extra visits due to having breastfeeding difficulties, she was duly visited and these were recorded as extra visits. If the peer counsellor failed to find the mother at home on three different occasions during the week scheduled for the visit, it was declared a missed visit. The peer counsellors had flexibility to choose the most convenient times to visit the mothers during the scheduled weeks.

We gave the peer counsellors one to one supervision visits every two weeks and held meetings with all of them monthly. We observed each peer counsellor with a mother once a month and gave her feedback on her performance after leaving the mother's compound. During these encounters, we reinforced the peer counsellors' knowledge and skills. During all these interactions we made note of what we discussed with them and what we observed them doing during peer counselling sessions.

At the monthly meetings the peer counsellors presented reports about their activities, achievements and challenges which we discussed as a group. We also revised some topics about breastfeeding in response to knowledge gaps identified during observation of the peer counsellors in the field. We recorded minutes of the monthly meetings and all these notes contributed to the data used for sub-study II.

Study design for this thesis

This thesis is composed of three sub-studies and we used mixed methods with primary emphasis on qualitative methods. The third sub-study was cross-sectional with mixing of methods within the same sub-study and the thesis as a whole. The sub-studies were done within the framework of PROMISE-EBF, a cluster-randomised trial which influenced some of the processes, for example, the study setting, subjects and sampling that were dependent on the PROMISE-EBF trial methods.

The data used were collected in a phased manner in 3 sub-studies, table 3:

- A pilot on the feasibility and acceptability of training community women as peer counsellors for promotion of exclusive breastfeeding.
- An exploratory study on experience of establishing individual peer counselling including training and retaining peer counsellors for exclusive breastfeeding, and
- A mixed methods study on experiences of the supported mothers towards individual peer counselling for exclusive breastfeeding in an African setting.

Sub-study I

The pilot study used qualitative methodology (QUAL) in the Iganga district setting. The main aim of this pilot was to assess the feasibility and acceptability of training community women as peer counsellors for exclusive breastfeeding in rural Iganga district. The study team chose Iganga district to avoid influencing the Mbale district with peer counselling, since Mbale had been identified for the PROMISE-EBF trial. We visited Iganga district health office and discussed with its health team the idea of piloting peer counselling for EBF in the district. They suggested Ibulanku sub-county as study site since there were very few ongoing health programmes in that location.

Together with the district health team, we primed community leaders at sub-county level about the study. Since the leaders are the "gatekeepers" to their communities, we held in-depth discussions with them to understand the set-up of the community and how to get the women for training as peer counsellors. We made detailed notes of these discussions.

Table 3: Summary of the sub-studies.

Paper	Study design	Data collection tools	Aims	Analysis
I	Qualitative	Field notes on observations during selection process and training FGD with peer counsellors, women and men In-depth interviews with community leaders; Minutes of meetings between peer counsellors and supervisors	Feasibility of training peer counsellors for EBF Community acceptance of peer counsellors for EBF	Thematic content analysis
II	Qualitative	Field notes on observations during process of engagement with community, selection and follow-up of peer counsellors. Pre-test, Post-test for peer counsellors; Minutes of community meetings and meetings between peer counsellors and supervisors	Effect of training on knowledge and attitudes of peer counsellors towards EBF. Experience of setting up a peer counselling intervention.	Thematic content analysis
III	Cross-sectional/ Mixed methods	Interview between 10 and 24 weeks post-natal	Perceptions and experiences of supported women with peer counselling	Qual: Thematic Quan: Frequencies, Chi square tests Mixed: Concurrent

The leaders suggested having representative women for training as peer counsellors from each of the 10 parishes in the sub-county, though we had initially planned to do the pilot in one parish. After reviewing with them the sub-county demography of the population to estimate the number of pregnant women, we agreed that each of the 6 smaller parishes would have one peer counsellor while the 3 larger ones selected 2 and the largest parish

identified 3 women for training. In total, 15 women were selected by the community with guidance from the study team who were trained as peer counsellors for breastfeeding as detailed in Paper 1. I was the leader of the trainers for the peer counsellors and made notes of the observations I made during the training as well as notes during the trainers' meeting at the end of each day.

At the start of training, we divided them randomly into 2 groups of 7 and 8, which constituted the 2 FGDs that were held at the start of training and the end of training. These were intended to understand how these women felt about breastfeeding in general and EBF in particular, and to plan what to give extra emphasis during the training. We also intended to explore how these women viewed themselves regarding their role as peer counsellors for breastfeeding.

The peer counsellors were followed up for 3 months as they supported their peers with breastfeeding. They identified pregnant women in their communities by asking their friends and neighbours and the pregnant women they visited. The follow-up visits involved discussions individually with the peer counsellors to understand their successes and how they were handling any challenges they encountered. Each of the peer counsellors was observed interacting with a mother on at least one occasion during the follow-up period. All the peer counsellors met once a month with the supervisors at the sub-county headquarters where each shared their experiences with the rest of the group. During these interactions, knowledge and skills were re-enforced by the supervisors according to the identified gaps. During all these interactions, we made detailed notes on what the peer counsellors shared, and recorded our observations as field notes that contributed to the data for analysis. I was the leader of the team in charge of training and follow-up of the peer counsellors recoded notes of whatever I observed.

Two months after training and follow-up of the peer counsellors, we held 2 FGDs with 9 and 10 of the women who had been supported by the peer counsellors in 2 of the communities. We intended to obtain general views of the women about the peer counselling to inform the larger study being planned. In addition, we had 2 FGDs with 6 and 7 of the husbands of the women who had been supported. Each FGD was moderated by 2 members of the study group, one for moderating while I took the notes. The FGDs with the husbands were held at the village meeting place under a shady tree, whereas those with the supported women took place in the compounds of 2 of the participating women under a shady tree.

Together with my colleagues we observed some of the peer counsellors interacting with mothers during peer counselling sessions and recorded our observations. These included our observation of the peer counsellors' display of knowledge about breastfeeding and use of counselling skills imparted from the training. Detailed notes of proceedings during the 3 monthly meetings between the peer counsellors and supervisors were recorded. After each session we discussed the notes and came to a consensus regarding their reflection of what we had observed.

Sub-study II

The second sub-study conducted in Mbale district used the qualitative approach (QUAL). Its aim was to describe the experience of establishing individual peer counselling including training and retaining peer counsellors for exclusive breastfeeding in the Uganda site of the PROMISE-EBF trial, Mbale district. This stage was informed by what we learned from the pilot in the Iganga district. It involved a detailed account of the process of setting up the peer counselling, including selection, training and follow-up of the peer counsellors and the community participation. Furthermore, it involved pre-and post-training assessment of the peer counsellors (QUAL).

After mapping the study area, 24 clusters were identified to participate in the PROMISE-EBF, of which 12 were randomized for peer counselling for support of EBF. What is described in this sub-study, therefore, was carried out in these 12 clusters, and involves selection and training of the 12 peer counsellors, as well as assessment of their knowledge and attitudes towards EBF before and after the training. It also explores what the peer counsellors did after the training and how they were supervised.

Since using community leaders had worked well in the pilot, we invited the local leaders of the villages identified for intervention to a meeting where we introduced the study to them and asked their input on how best implement it. They suggested village meetings for selecting the peer counsellors and each one of them agreed to organise the women in their villages to come to a meeting with the study team in each village. During these meetings and discussions, my colleague and I took notes of the issues being discussed, including some of the community dynamics and observations of how the women were interacting with each other, and the agreed outcomes from the meetings. I noted the non-verbal expressions while making the notes.

The training of the peer counsellors is described in paper II. During the period that the peer counsellors were supporting the women with breastfeeding, they were given continued mentoring in the form of follow-up visits at their homes by the supervisors. During these visits, discussions were held to identify the challenges they were facing while visiting the women, and attempts were made together to find solutions. We observed each peer counsellor during a counselling session with a mother at least once every month in an effort to identify any gaps in knowledge or skills about breastfeeding. We gave the peer counsellor feedback on their performance after leaving the woman's compound, and attempted to fill their gaps in terms of knowledge and counselling skills. During these visits we also made note of areas where peer counsellors had problems for discussion with the whole group at the subsequent monthly meeting. Observations made during these visits were reflected upon after each visit and detailed notes were made. We also continuously noted any challenges experienced during these visits. These notes were read and reflected upon from time to time during the study, and trends and patterns were noted and recorded as the study progressed.

During the monthly meetings, each peer counsellor was encouraged to give a verbal report of their progress and experience, including what they found easy and what proved challenging. We also revised topics where we found knowledge gaps in many of the peer counsellors during the support supervision visits. The proceedings of these meetings were

also recorded, which were later read and discussed by the study team to identify any patterns. We sought clarification of anything we did not understand at the next encounter with the peer counsellor.

Sub-study III

The third sub-study was a cross-sectional study which described the experiences of the supported mothers towards individual peer counselling for exclusive breastfeeding in an African setting (quan). However, the cross-sectional study had an additional qualitative component as open-ended questions were also allowed into sections of the questionnaire (QUAL). The qualitative component was dominant both under data collection, analysis and interpretation, being referred to as (QUAL+quan).

A total of 370 women were interviewed between 10 and 24 weeks following childbirth using a semi-structured questionnaire about their feelings towards the process of peer counselling. This number is bigger than the number of women in the intervention arm of PROMISE-EBF as it includes all pregnant women living in the intervention area who expressed interest in receiving peer counselling visits regardless of whether they were excluded from the PROMISE-EBF trial. A profile for this sub-study is included in Paper III. The women's feelings about the usefulness of the peer counselling, the adequacy of the time that the peer counsellor spent with them, and how they were handled by the peer counsellors, were some of the aspects covered by the questionnaire. The findings of this sub-study are reported in paper III. The timeline of these sub-studies is summarised in Figure 7.

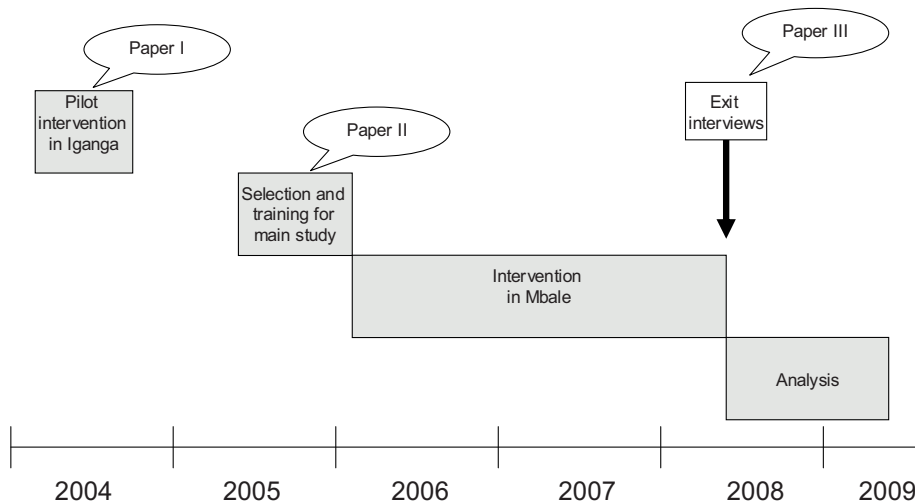


Figure 7: Timeline of the sub-studies.

Subjects

The subjects for the sub-studies used in this thesis were peer counsellors and the counselled women, table 4. For sub-study III, all the mothers identified in the intervention clusters who showed interest in being seen by the peer counsellors were visited and supported by them, irrespective of whether they were excluded from the PROMISE-EBF trial or not. This is why the number of mothers reflected in sub-study III is more than that in the intervention group in the PROMISE-EBF trial profile.

Table 4: Study subjects for the sub-studies.

Sub-study	Subjects
I	15 peer counsellors in the pilot study, Iganga
II	12 peer counsellors in the PROMISE-EBF trial, Mbale
III	450 mothers in intervention clusters in PROMISE-EBF trial, Mbale

Data collection and instruments

A participatory process was used to introduce the study to the community, both at the pilot stage and the main study. During this process, notes of all observations about it were taken. During the pilot study (sub-study 1), the instruments used included: field observation notes, notes of the in-depth interviews with the community leaders, notes made during meetings with the community leaders, and FGD guide used with the peer counsellors, supported women and the men in the community (appendix 1). In addition, reports from the district supervisors, peer counsellors as well as minutes of monthly meetings with peer counsellors, were used as data sources. During sub-study II, the instruments used were minutes of meetings with community leaders, notes of observations made during the process of selecting and training peer counsellors, and notes of discussions made during the village meetings and questionnaires (pre-test and post-test for peer counsellors, appendix 2). The notes written during the process of interacting with different groups of people in the community provided data for analysis. For sub-study III, the data were collected using a semi-structured questionnaire (appendix 3) with both closed-ended and open-ended questions during the exit interviews with the supported women.

Data management and analysis

Sub-study I

Data analysis began with our entry into the community as we discussed with the community leaders and tried to understand the local setting and context. We had the opportunity to clarify what was unclear on subsequent interactions. I read and re-read the field notes obtained from the in-depth discussions and observations while looking for patterns which were then given codes. The codes were written on coding sheet and as more notes were read and given codes a coding manual was established. Another colleague on the team read the notes and we agreed on the codes. These were read and re-read and those deemed to portray similar ideas were grouped together and given themes while those that were noted to cover

wider aspects were sub-divided and put in groups where they seemed to fit best. These processes have been referred to as splicing and linking of codes. The analysis focused on description of patterns observed and identifying the commonly recurring themes and making general impressions from the data under these themes.

The information from the taped FGDs was transcribed verbatim and the text was read and re-read to identify similarities which were grouped together and given codes. These were read again while looking for patterns and these were given themes. Interpretations from these notes were outlined under these themes. In case of any conflicting ideas in the notes, we sought clarification at the next visit to the community to elucidate what had been implied. Considering that we intended this pilot to inform the planning of the intervention for the large community randomised trial, we presented the findings under the sub-headings given in paper 1. The findings from this pilot study served as a basis to design the peer counselling intervention for the PROMISE EBF trial.

Sub-study II

Data collection and analysis was a continuous process throughout the duration of the study. From the time of initiating dialogue with the community about the study up to the end of the study, I made notes from our discussions as well as observations I made during the selection, training and follow-up of peer counsellors. I kept reading and re-reading these notes, gave them codes and discussed them with my colleague with whom we were overseeing the peer counselling intervention. I entered the codes on a sheet. We used paragraphs as the coding unit and ended up with many codes. We read through and those that had similar ideas were grouped together and themes were given to them. By the end of the study, we had reached saturation, since we were hardly getting any new ideas from the data.

The pre-test and post-test had both closed- and open-ended questions. These were targeted towards exploring the knowledge and attitudes of the peer counsellors about breastfeeding before and after training. Tallies of selected knowledge and attitude questions for all peer counsellors were computed for the pre-test and post-test as well as during intervention. These data were used to identify changes in knowledge and attitudes of the peer counsellors relating to EBF after the training. We picked some areas that were covered by the training and assessed how many of the peer counsellors had what was considered the correct knowledge about each of these areas at the different time-points. Before training, immediately after training and after 10 months of counselling, this information is summarised in Table 2 of paper II. Since the number of peer counsellors was small, these were presented as absolute numbers.

Sub-study III

For paper III, women's responses to the open-ended questions were post-coded by a team of 4 members of the study team continuously as data collection progressed. I was the lead person on this team working together with the second peer counsellor supervisor and 2 other members of the PROMISE-EBF team. The coding team worked together in a group. The team read through each of the responses to the semi-structured questions and identified ideas presented in the response, giving each a code. Similar ideas were given the same code after agreement within the team. The codes were entered on a coding sheet. The team

discussed these codes and reached agreement about the emerging experiences of the women toward the different aspects of the peer counselling process. The details of the coding process have been described in paper III. Women's experiences relating to the different aspects of peer counselling were categorised under the following pre-defined themes: satisfaction with explanations by peer counsellors, usefulness of visits by peer counsellor, and interaction of peer counsellor with the women and women's suggestions regarding future peer counselling. Selections of the mothers' responses to some questions have been presented as verbatim quotes in this paper.

The responses to the closed-ended questions were entered using EpiData 3.1 software and analysis was done using SPSS 15. Continuous variables were summarised as means. Categorical data were statistically analysed by the Chi square test or Fischer's exact test for associations in attempts to find correlations between the women's socio-demographic characteristics and their satisfaction with peer counselling.

Ethical considerations

Permission to conduct the study was obtained from the Makerere Faculty of Medicine Ethics and Research committee, the Uganda National Council of Science and Technology, and Iganga and Mbale District administration. The community leaders of Ibulanku sub-county, Mbale Municipality and Bungokho gave consent on behalf of their communities to participate in the study. The peer counsellors agreed to participate after being selected by their communities and receiving further briefing from the study team about what was expected of them. The individual women in the study also gave consent to participate by signing a consent form. The information obtained was kept confidential and study numbers were used to identify the questionnaires. While presenting quotes in the publications, we have presented them in a way that does not reveal the identity of the quoted person.

Summary of results

Paper I

Pilot experience of peer counselling for exclusive breastfeeding in a rural Ugandan setting

This paper assessed the feasibility and acceptability of training community women as peer counsellors for exclusive breastfeeding in rural Iganga district in Uganda. The idea of community peer counsellors giving EBF support was welcomed by the district health team, who identified an appropriate site for the study and participated in the whole process of priming the community leaders, selection and training the women as peer counsellors, and giving them follow-up visits. The community leaders also embraced the peer counselling approach and participated in selection of the peer counsellors, while the women and men happily received the peer counsellors in their homes.

The women were able to appreciate the messages from the training concerning breastfeeding, despite their modest formal education. This was concluded from the way they answered questions as well as discussing issues regarding breastfeeding during the training. The peer counsellors found the “counselling” approach a new way of sharing information as they were used to getting “advice” from the health workers, and they felt this was a better approach since it allowed the supported women room to come to their own decisions. They freely discussed some cultural beliefs associated with breastfeeding, some of which were considered dangerous for the babies’ well-being. Consensus was reached by the peer counsellors and the trainers on how to appropriately correct mistaken ideas concerning breastfeeding while counselling mothers to avoid antagonising the community.

The peer counsellors observed that the knowledge they obtained from the training was beneficial and they vowed to start practising it with their own babies. They were received by the community and none of them were denied access to any of the homes they visited to support mothers with breastfeeding. Each peer counsellor supported on average 15 mothers over a 2-month period. During these visits, the peer counsellors showed a tendency to share a lot of information with the mothers at one visit regardless of how relevant the information was at the time of the visit. However they managed to fit the peer counselling visits to mothers within their already busy schedules.

The peer counsellors observed that many mothers had problems with positioning and attachment of babies to the breast and they felt confident to help them. They further identified other common breastfeeding problems in their community, such as insufficient breast milk, sore nipples, breast engorgement and mastitis. They also observed that most of these problems were eased when they helped mothers to position the babies on the breast properly.

The women were happy to have someone within their community to help them with their breastfeeding problems. They were free with the peer counsellors as they felt they were like them. The men felt the midwives and traditional birth attendants should play a big role in supporting breastfeeding mothers as the women interact with them. They also felt that the

breastfeeding mother, her mother-in-law and the husband were key persons in promoting breastfeeding within the family.

The peer counsellors appreciated the supervisory visits they received from the trainers, as they offered an approach for sharing their challenges. They also had varied expectations such as improving breastfeeding practices for their own children, while some even wished to be trained as health workers. One common request to all of them was that they wished for some form of remuneration, although they had initially volunteered.

Paper II

Establishing individual peer counselling for EBF in Uganda: implications for scale-up

This paper describes the experience of establishing individual peer counselling including training and retaining peer counsellors for exclusive breastfeeding in the Uganda site of the PROMISE-EBF trial, Mbale district. Paper II It also focuses largely on the training and follow-up of the peer counsellors, and highlights some implications for scaling-up this intervention in similar settings.

The community was receptive to the concept of peer counselling for EBF. The community meetings for selection of the peer counsellors were well attended. The elderly women had some influence over the younger women's decisions during these meetings, and their opinions were respected by both the younger women and their husbands. The women had to seek permission from their husbands before agreeing to participate in the study.

Before training, the peer counsellors had knowledge gaps about aspects of breastfeeding, mainly regarding what factors increase breast milk production or how to continue breastfeeding exclusively in case they had to leave their baby at home for some reason. They also thought it was necessary for women to clean their breasts before each feed. None of the peer counsellors thought frequent stimulation of the nipples by the baby's suckling was associated with increased breast milk production. They also had negative attitudes towards feeding babies with colostrum, which they considered "dirty". Expressing breast milk for babies was also thought to be dangerous or they felt it simply "looked bad to milk a human being".

After training, all the peer counsellors showed increased knowledge about most aspects of breastfeeding. Two peer counsellors were still unable to associate more frequent suckling of the breast as a major factor in increasing breast milk production. Physiological causes of "leaking" breasts that were discussed during the training and follow-up seemed to be forgotten by all the peer counsellors. Their attitude towards colostrum had also changed; they could describe the positive effects of colostrum, such as the nutritive and protective benefits for the baby. They were all positive towards expressing breast milk and described it as a useful way of maintaining EBF for working mothers who have to leave their babies at home. Peer counsellors were also able to explain why it was unnecessary to clean breasts before each feed.

The peer counsellors were also happy about the new status they had acquired within their communities. They were interacting with more people and had made additional friends

within their communities. Furthermore, the small allowance they received from the study had helped to improve their well-being at home as they no longer had to rely on their husbands for all their family needs.

Some mothers tended to move from their homes temporarily around the time of childbirth in search of a more supportive environment. Many married women went to stay with their own parents and young single mothers also moved homes in search of social support. Such movements presented a challenge for the peer counsellors to keep scheduled visits.

Important stakeholders in infant feeding decisions were identified as the grandmothers and husbands. These seemed to exercise a lot of control over what the younger women in the community did and the decisions they made regarding infant feeding. The grandmothers also had some influence over their sons who are traditionally supposed to be the decision-makers in the homes.

Paper III

Mothers' experiences of individual peer counselling for EBF in Eastern Uganda

This paper describes the experiences of the supported mothers towards individual peer counselling for exclusive breastfeeding in an African setting. Their sentiments about future support by peer counsellors and possible extension of peer counselling to their friends are also highlighted.

The 370 women interviewed were aged 15 to 46 years with a mean age of 26 years. Overall, the majority of women (71%) were satisfied with the peer counselling they received. Over 95% expressed satisfaction with usefulness of visits, having acquired new knowledge about breastfeeding, feeling free to discuss with peer counsellors, and feeling respected by the peer counsellor during visits. Almost all the women felt they would welcome a peer counsellor for their next pregnancy or recommend one for a friend. Regarding the opportunity to ask questions, 72% felt the peer counsellor had given them adequate time, whereas 77% felt the peer counsellor had spent sufficient time with them at each visit.

The univariate analysis showed a significant association between the number of visits the women received from the peer counsellor and their satisfaction with their counselling. The women who received 5 or more visits were more likely to give positive responses regarding their satisfaction with the different aspects of peer counselling and were more likely to show overall satisfaction ($p < 0.001$).

The women's reasons for their feelings about the different aspects of peer counselling were examined. The women felt they were given enough time if the peer counsellors did not show them signs of being in a hurry, but gave them a chance to ask the peer counsellor questions.

The large majority of the women (90%) were satisfied with the peer counsellors' explanations about breastfeeding. The main reasons they gave included the peer counsellor explaining well, so that they understood how they helped them to position babies on the breast. Some women referred to their babies being healthy, or having managed to change

their breastfeeding practices for the better, as reasons for saying they were satisfied with the peer counsellors' explanations.

A few women, however, were dissatisfied with the peer counsellors' explanations because they felt they were inadequate, while others related their dissatisfaction to having received too few visits from the peer counsellor.

Almost all the women (97%) considered peer counselling a useful service. The reasons they gave varied from the baby having benefited from the peer counsellor's teaching, the woman having acquired knowledge about breastfeeding, including learning to position a baby on the breast properly, and breastfeeding exclusively for 6 months. Some women said they had saved some money by breastfeeding exclusively as they did not have to buy cow's milk and sugar. Over half the women (56%) felt there was nothing they wanted to know about breastfeeding that the counsellor did not tell them. Some, however, wanted the peer counsellor to discuss complementary feeding and family planning.

Regarding interaction between peers, almost all the women (95%) felt they could freely discuss matters with the peer counsellor. They attributed this to the peer counsellor approaching them nicely, being a familiar woman, and "sitting" with them during visits. The few women who said they did not feel relaxed with the peer counsellor attributed it to her being older than them or a stranger.

Almost all the women (99%) felt the peer counsellor showed them respect. The reasons were many, but notable among them were that the peer counsellor talked nicely to them, asked permission before talking to them, went to their homes and addressed them politely.

The women generally felt they had acquired knowledge from the peer counsellors, that their babies had benefitted from the peer counselling and they were happy to be visited at home by the peer counsellors.

Discussion

In this section, I shall discuss the methods with focus on the strengths and weaknesses of the design chosen, the validity of the sub-studies and the study as a whole. I shall also reflect on the theoretical framework as well as the findings.

From the sub-studies in this thesis, we see that it is possible for lay women from the community with modest formal education to be trained in breastfeeding counselling and acquire knowledge and skills to support their peers (Papers I and II). All the peer counsellors remained in the studies until the end. The training had the effect of leading to improved knowledge and attitudes of the peer counsellors towards EBF (Paper II). The process of setting up a community-based peer counselling strategy highlighted some factors of importance with regard to the possible scaling-up of the strategy:

- community involvement,
- understanding the power structures both at the family and community,
- identifying and involving other stakeholders in infant feeding
- adequate training and continuous support supervision of peer counsellors
- understanding behaviour of women around childbirth
- reasons why supported women were happy with the peer counselling.

These are discussed in Papers II and III.

Reflections on the theoretical framework applied in the thesis

The sub-studies comprising this thesis were not planned and implemented using theory in a strict sense but retrospectively it was found useful for describing what we did. From the studies in this thesis, there were 2 clearly defined performance objectives: lay women performing peer counselling for EBF for the mothers, and encouraging EBF practice by the supported mothers. The identification of programme objectives (i.e. performance and learning objectives) is in line with step 1 of IM, table 5. However, ideally in IM the programme objectives should have been defined after an assessment of the need, which was not done in this thesis. Having a main programme objective is considered to be an important starting point so that the methods and strategies for achieving it can be identified. The learning objectives help answer the question of what knowledge and skills the peer counsellors need to acquire to be competent to counsel and support their peers with EBF and what the mothers need to learn to practice EBF.

In order for lay women to counsel their peers about EBF, they need to be given knowledge and skills about EBF, for example, its benefits, how to practice it and for how long. It was necessary to package the information about EBF in such a way that it would be easy for the peer counsellors to understand, internalise and share with their peers. It was also necessary to impart simple counselling skills to these peer counsellors for use during interaction with their peers. This is an important aspect that was highlighted in an earlier study in which a number of the supported mothers reported that some peer counsellors were unable to give them adequate explanations about parts of the information and were therefore unable to help them overcome breastfeeding problems [135]. It was therefore important for the programme

to target training and follow-up of the peer counsellors, which was crucial for the peer counsellors to interact adequately with their peers.

From the available literature, it can be seen that certain practices that disrupt successful EBF were generally common in Uganda as a whole and the study area in particular. These included: delayed initiation of breastfeeding, use of prelacteal feeds, mixed feeding and early introduction of complementary feeds [30, 73, 79, 150, 151, 158]. It was therefore important for the programme to target these aspects to increase EBF.

Table 5: Summary of use of Intervention Mapping in discussing sub-studies in this thesis

	Intervention mapping steps	Our studies
Step 1	Define the programme objectives (i.e. performance and learning objectives)	<ul style="list-style-type: none"> - For lay women to perform EBF counselling (performance objective 1) - Individual and environmental determinants of doing peer counselling of EBF – what lay women need to learn in order to practice effective counselling. (learning objective 1) - For mothers to perform exclusive EBF practice (performance objective 2) individual and environmental determinants of EBF - What mothers need to learn in order to practice EBF (learning objective 2)
Step 2	Identified the theoretically derived methods and strategies for achieving the program objectives using the SCT	<ul style="list-style-type: none"> - Educational methods identified to achieve performance objective 1: Knowledge provision and skill training of lay women to enable them to perform effective EBF counselling (paper I and II). - Educational methods identified to achieve performance objective 2: knowledge transfer, guided practice and modelling to increase mothers actual knowledge, install positive attitudinal and normative attitudes and increase self efficacy.
Step 3	Make an organised programme that is acceptable to both the implementers and the participants	<ul style="list-style-type: none"> - Community entry and involvement - Selection of peer counsellors - Training and continuous support supervision of peer counsellors (paper I and II)
Step 4	Develop a plan for implementing the program	<ul style="list-style-type: none"> - Done in the PROMISE-EBF trial
Step 5	Evaluate both the process and effects of the intervention	<ul style="list-style-type: none"> - Evaluation of the training of peer counsellors with respect to their actual knowledge and attitudes regarding EBF (paper II) - Evaluated the process through interviews with mothers after completing peer counsellor visits (paper III). - Impact evaluation is reported in the PROMISE-EBF paper in the Lancet

In accordance with step 2 of IM, the methods identified for achieving the programme objective were: knowledge transfer, guided practice, and modelling using SCT as a basis for these methods. To be able to implement knowledge transfer, give guided practice and modelling through peer counselling, local lay women were trained to perform effective counselling on EBF in the community context. During this training they were provided with correct knowledge about EBF and skills with respect to practicing EBF, those skills being an important instrument in empowering mothers to practice EBF. In this process, IM and SCT were used to complement each other.

Step 3 of IM deals with the organisation of the programme. This involved community entry and involvement, selection of the peer counsellors, and training and continuous support supervision of the peer counsellors. As discussed in Papers I and II involving the community had a role in acceptability of the peer counselling strategy. Emphasis on community involvement when planning interventions that affect them has been made in various fora including the Alma Ata declaration of 1978 [107], and advocated in some studies involving some conditions, e.g. obesity and behaviour related to health (smoking, lack of physical activity and unhealthy diets) [178-181]. Involving communities seems to be important in programmes aimed at changing behaviour of individuals, since their decisions will be affected by influences from the community [182]. In sub-studies I and II in this thesis, it was noted that the women targeted to exclusively breastfeed were living in a family structure which had influence on whether or not they practised EBF. Their decisions were also influenced by the culture in their community, for example, the cultural beliefs and practices affected their ability to practice EBF.

The first sub-study highlighted the importance of identifying what the community wants rather than imposing on them preconceived and predetermined decisions. The insistence of the community leaders on covering the whole sub-county indicated that they had an idea about what they considered good for their community members, and as a result they clearly asked for it. The flexibility we displayed during the meetings with the leaders in accommodating their proposals within the programme might have influenced their acceptance of the intervention. Reasons for involving communities have been summarised as social justice, accountability and widening the base of values including cultural sensitivity, for decision-making in public health [180, 183].

Another strategy employed was training and follow-up to provide support supervision for the peer counsellors. This involved choosing a suitable curriculum for the context (the African setting) and the beneficiaries (the peer counsellors). It is important to carefully plan the curriculum so that it is culturally sensitive in addition to providing the required information to use, basing it on the local context where the peer counsellors will practice their skills. This is important to ensure that the content of the curriculum is relevant for the beneficiaries as this may promote the uptake of the knowledge from their own training. Support supervision is important for any programme to ensure the participants carry out their prescribed roles. In this case it was also important for keeping the peer counsellors' knowledge and skills updated so that they continuously passed on the right message to the

mothers being supported. In addition, support supervision has been reported as a source of motivation for the peer counsellors [135].

In order to support women in practicing EBF, the peer counsellors visited the women at their homes and discussed with them the importance of EBF. The methods used by the peer counsellors during these visits included information sharing, social persuasion which were described by Bandura in his SCT [162]. Some of the peer counsellors with young infants felt free demonstrating some skills to the mothers as they breastfed their own babies and shared their own breastfeeding experience. This approach could have strengthened the peer counsellors' arguments for practising EBF. In this way, peer counsellors also acted as role models for the mothers, who in turn trusted them and the information they were sharing, accepting their suggestions. This could have had a positive influence on the outcome of EBF in these mothers, hence the nearly 2-fold increase in EBF among the women who were supported by the peer counsellors (appendix 4).

That the women viewed the peer counsellors as their role models is highlighted in paper III. The women were overwhelmingly happy with the peer counselling visits; the reasons they gave for satisfaction were largely related to the way the peer counsellors presented themselves to them, including sitting with them, listening to their views and accepting them. This is an area where professional healthcare workers have been reported to fare poorly, especially when the beliefs and views of the women clash with established scientific knowledge – the health workers hardly listen or consider them as important [184].

In this case, the social cognitive theory [162] was identified as useful in articulating the learning objectives in retrospect. Peer counsellors who have not been trained and given the skills and knowledge to support mothers with EBF are unlikely to be successful. It is possible that women who do not have sufficient knowledge about the importance of breastfeeding their babies exclusively will not do it. Women lacking knowledge about the usefulness of colostrum are unlikely to feed their babies with it, and women lacking the skills of how to position their babies properly on the breast will not do it properly. Furthermore, women whose husbands or mothers-in-law insist on their giving other feeds are more likely to practice mixed feeding, whereas those who lack confidence in their ability to produce sufficient breast milk for their babies may give other feeds. Educational techniques, such as providing information, building skills and reinforcement, were then provided to empower and improve self-efficacy of the peer counsellors and mothers with respect to effective EBF counselling and performing EBF, respectively.

Talking about self-efficacy here is not intended to imply that it is the only predictor of the practice of EBF in this setting. The study was done in a patrilineal society where a woman commonly moves into her husband's home after marriage. In addition, the children belong to the husband and his clan, and these are important in decisions regarding the children, including those concerning infant feeding [184]. In such a setting, it was noted that the "significant others" for the women regarding infant feeding decisions were important. These included husbands, mothers-in-law and mothers of the women. It was therefore planned that they would be invited by the woman to join in the peer counselling sessions, if they so wished. These were considered important in decision-making at family level regarding those who could easily affect the intervention negatively if they were not brought on board. This

raises the issue of whether the intervention then remains purely one-to-one peer counselling, but in reality the counselling sessions which were attended by others in the home were few.

Recognising this, we present a point of departure from the emphasis on self-efficacy being responsible for the woman's behaviour, in this case, EBF, since subjective norms are likely to be more important to the woman in view of the context where the study was done. This argument has been promoted by some critics of the SCT who have emphasised the importance of looking beyond the immediate social and physical context to take into account a wider range of societal and cultural factors [185]. On the other hand, this may be just one of the impediments these women have to overcome and if they have attained sufficient self-efficacy, they can overcome it and go on to perform the required behaviour [168].

Step 5 of IM involves evaluation of the programme and this is partly highlighted by sub-studies 2 and 3, where the knowledge and attitudes of peer counsellors regarding EBF and the mothers' perceptions and experiences of the peer counselling process were explored.

Reflections on the methodology used

The first 2 sub-studies employed qualitative methodology which was considered sufficient to answer the set objectives. The third sub-study was of cross-sectional design, which included all the 370 women who received the peer counselling intervention, but included some open-ended questions in the questionnaire. This introduced a concept of mixed methods within the thesis. I will therefore briefly discuss the different methodologies used in this thesis.

Qualitative methodology

Qualitative research methods have been described as "strategies for the systematic collection, organisation and interpretation of textual material obtained from talk or observation, which allow for the exploration of social events as experienced by individuals in their natural context" [186, 187]. It is often used to explore phenomena that we have relatively little knowledge about. It was also suggested that qualitative inquiry could lead to a broader understanding of medical science. Qualitative methods help us to understand more about characteristics, complexities, how phenomena are interrelated, and some specific matters related to experiences, emotions, beliefs and motives. It was therefore identified as an appropriate design for the first 2 sub-studies of this thesis.

There are various methods used to collect qualitative data, such as general observations, FGDs, semi-structured interviews. The method chosen for collecting particular data is influenced by the question the researcher wishes to have answered. In this thesis, observations, FGDs and semi-structured interviews were used. A combination of methods is referred to as triangulation, which is supposed to increase the credibility of the study. What may be missed by one method can be picked by another.

In this study, we set out to understand what it takes to set up a peer counselling intervention for EBF in a community. This involves a number of players, including policy makers, community leaders and the community at large. These various bodies can have an impact on

an intervention. Despite the intervention targeting a pregnant and later a breastfeeding mother, the mother lives within a family and a wider social structure, hence the inclusion of the community. There are factors which may be beyond her control, but which may influence her ability to take up targeted behaviour, in this case EBF. This prompted us to employ different methods to try to understand the woman's context as an individual, the family level and the larger community.

Using observation of participants as a data collection method helps the researcher to capture non-verbal communication in addition to verbal communication. The non-verbal aspect may also help to explain some of the things said or left unsaid. The method helped us to identify and note a number of issues which had an impact on the peer counselling intervention that were not openly discussed. Observations also help the researcher to inquire more deeply into aspects that may not seem clear or in instances when insufficient information has been obtained.

Using FGD's helps to get information from informants that may be considered too personal and sensitive to discuss with a stranger. Informants in a FGD may find it easier to give information as if it does not relate to themselves, thus enabling the researcher to capture it. Sometimes, informants may give answers that are socially desirable. In case of the peer counsellors being interviewed by their trainers, they might have felt they had to give the answers the trainers wanted to hear. To avoid this we used FGD's to gain a greater understanding of what the peer counsellors felt about EBF both before and after the training, without making them feel as if they were talking about themselves. This proved helpful in identifying the topics that needed fuller discussion and clarification during their training.

The FGD's used with the supported women and men in the community described in paper I were designed to get a wider view of how the community considered EBF. This was again useful in identifying which messages to give more attention to, and which scenarios to concentrate on during discussions held during training. Since the topic of discussion in the FGD's was a concern of the whole community using FGD's was considered useful in providing us with a wider view of the subject by the group as opposed to individual interviews. This approach also helped us to understand better how the women and the men in the community felt about EBF. This was important to understand given that decisions on infant feeding in this community are made in consultation rather than individually. We considered this to be important in our planning the next steps of the peer counselling intervention. Triangulation of these methods contributed to improving the validity of the study.

The FGD's with the men were held separately from those with the supported women. This was intended to allow the women to express their opinions freely in a homogeneous group of women. In this community where men make the decisions for the family, having one FGD of both men and women could probably have affected the group dynamics with the women feeling shy and not expressing their opinions freely.

FGD's also have their limitations. The researcher may not have much control over the proceedings of the FGD and one needs to be careful to ensure they get the information they need through careful moderation while not taking over the process at the same time. FGD's

are also difficult to organise since it involves mobilising several participants to converge in one place at the same time. In our study we faced this challenge since the study was based in the community where people work in their fields in the mornings. We noticed that men tend to gather in groups at the trading centres in the afternoons and we decided to plan the FGD's with the men in the afternoon and sent them prior messages of invitation through the peer counsellors and their wives.

FGD's may also suffer from group effects for example having outspoken members in the group with a tendency to overshadow others and this is where a moderator becomes important to ensure that all members in the group are given an opportunity to contribute. At times two or more people might try to speak at the same time and this may pose a challenge understanding portions of the scripts where this occurred during the stage of transcribing.

Trustworthiness of research

The focus in qualitative research is on discovery, with the researcher actively involved in and acting as the main tool in the research process. The question is how the researcher may have influenced the results and this requires some discussion. In quantitative research, the standards used to determine scientific strictness are: internal validity, objectivity, reliability and generalization. However in qualitative research, these are described as: credibility, dependability, confirmability and transferability, which I will briefly discuss.

Truth value (Internal Validity or Credibility)

This refers to whether the data collected are credible and truthful findings, and covers both collection and analysis of the data. This thesis focuses on understanding the process of setting up a community-based peer counselling intervention. This involved many parties, including the community and its leaders at a higher level; the mothers, fathers and other significant individuals at family level, especially the grandmothers, as well as the selected peer counsellors. The peer counsellors were also part of the community. During our interactions with each of the different groups, we had to be open minded and very observant, taking detailed notes of all our observations. Our repeated interactions with the different groups of the community at various stages of the process helped us to understand the study setting and our support role better for the peer counsellors throughout the study period. We had the opportunity to seek clarification on any problem since we made repeated visits to the community.

During data collection, I had to face the challenge of not being very fluent in the local language and I had to rely on the interpretation by my colleagues while in the field. Notwithstanding, my physical presence in the field enabled me to observe the whole process, including the non-verbal communication. I found this a new and learning experience, given my medical training background, and I had to continuously remind myself to keep an open mind as I made these observations. I kept comparing notes with my colleague to minimise chances of missing some information due to the language barrier. My understanding of how and why the women in the community behaved in the way they did regarding decisions on feeding their babies could be influenced by my background and medical training. One example is where women had to first consult their husbands before accepting to participate in the study. I had to grapple with the realisation that much as I

thought I understood many things that happened in the community my medical training and exposure to a wider world view had influenced the way I reasoned. I had to keep this in mind in order not to distort what I was observing by what I believed since I was the main research tool. It was important to do this to avoid distorting the truth value of the studies.

On the other hand, being the main research tool in these sub-studies could have influenced the findings. As a medical doctor from the city going into the community, my presence could have affected how the members of the community behaved as I interacted with them. This could pose a danger of my failing to get a true picture of the real world out there. I made an effort to establish rapport with the community members through my interactions with them. Making repeated visits to the community during the study period facilitated my attempts at development of rapport with the community. The way I handled and interpreted the data could have been influenced by my background in quantitative research and I kept this at the back of my mind throughout the study and endeavoured to keep reflecting on the principles of qualitative research.

In the analysis, we looked at the data that had been collected, and during the process of coding and grouping of similar ideas I was able to reflect on what had transpired in the field. This was a time-consuming process with a danger of carelessness that could lead to premature conclusions. The long period of follow-up enabled me to get ample time to reflect on and try to understand the messages that I was getting from the data. It also allowed me opportunities of seeking clarification from the relevant sources in the community on subsequent visits. Working together with a colleague with a social science background and experience working with communities was helpful to me as I continuously learnt from her how to adjust my thinking from the hospital setting to the community. I kept reflecting on the ideas coming out of the data and would discuss with my colleague regarding what we had actually observed while in the field. In case of any doubts, we would seek clarification from the relevant sources in the community at the next visit.

Consistency (Reliability or Dependability)

In quantitative research, consistency is shown when a study is performed in a stable and controllable way so that it can be repeated. In qualitative research, the study should adapt to changes in the studied environment and to changes that take place during the study period, since it is difficult to ensure stability in qualitative research designs. This may be seen to contradict the rules and recommendations recognised in them. In qualitative research, when there is flexibility such that data collection and analysis are done simultaneously, dependability can be improved. The ideas obtained earlier during the data collection process offer an opportunity to re-explore certain aspects to gain an in-depth understanding.

In the sub-studies used in this thesis, our repeated visits and interactions with the community enabled us to explore in more detail certain issues on subsequent visits and interactions. In sub-study 1, we went into the community with an open mind without fixing the number of peer counsellors to recruit, and we were therefore able to accommodate the community's need to select the peer counsellors from the whole sub-county. This was the case despite our initial plan to put the peer counselling in one parish rather than the whole sub-county. This enriched our experiences in interacting with these peer counsellors more than if we had picked them from only one parish.

In sub-study II, we spent 2 years of repeated visits to the community. This exposed us to various changes in the community to which we needed to adapt. One example was the way in which women in this community behave from the time of pregnancy through childbirth and thereafter. We noted that a number of women moved from their own homes to their parent's homes, while some joined their husbands at their workplaces in the urban areas if they could expect better social support. On observing this, we encouraged peer counsellors to find out from the women before they delivered if they planned to move to another place after delivery, so that they could be found in their new places of abode if they were not too far away. This is an important aspect to consider and address in case of plans to implement the peer counselling for EBF on a large scale.

Neutrality (Objectivity or Confirmability)

Confirmability corresponds to objectivity in quantitative research, as both of these affirm neutrality so that the reality has not been distorted. With confirmability, evaluation of how neutral a research project is focuses on the data rather than the researcher. This requires the method to be systematic and thorough so that the researcher continuously and critically questions the findings in reviewing the data.

In the sub-studies, we analysed our data to understand what they showed. We kept discussing what we got from the data. During the coding, we involved 2 other members of the PROMISE-EBF study team who were not directly involved in supervising the peer counselling intervention to discuss the codes and agree on the messages coming from the data. We also looked at what appeared to be negative in the data, which helped us to review it more critically to be sure the information we got was correct (valid).

Applicability (Generalisability or Transferability)

In quantitative research, generalisability or external validity is a major criterion for evaluating the quality of a study, although it is regarded as a complex issue even in studies that yield high quality evidence. In qualitative studies, generalisation is even more complicated and controversial, with some suggesting that it requires extrapolation that can never be fully justified. This is because some findings are always embedded in a context and knowledge is to be found in particulars [188]. In 1993, Firestone [189] developed 3 models for generalisability:

- Extrapolating from a sample to a population (statistical generalisation) - suitable for quantitative studies.
- Analytic generalisation – which has relevance for both quantitative and qualitative studies.
- Case-to-case translation – more widely referred to as transferability.

According to Hamberg et al., “conclusions made in a qualitative study are not proof, but a description and an interpretation” [190]. It is important that the findings are understood by others. Hence in qualitative research, findings cannot be generalised as in quantitative research, and the equivalent term used is “transferability”. It is therefore useful to describe

the context in which the study was done and make a detailed description of the subjects for readers themselves to decide whether the findings can be relevant in other settings.

The findings of this study are likely to be relevant in similar settings, especially in sub-Saharan Africa, where most populations are rural-based with a fairly intact extended family system and male-dominated households. Furthermore, in these set-ups decisions are made in consultation rather than by individuals; for example, women are likely to consult with friends or older women before they make infant feeding decisions as opposed to communities where women make their own individual decisions [184, 185].

The cross-sectional design (quantitative)

A cross-sectional study requires a single interaction between the subject and the researcher collecting data. This implies there are markedly reduced chances of loss to follow-up.

One interest of this thesis was in understanding how the supported women felt about the peer counselling intervention and also what proportion of them were satisfied with peer counselling. The design was considered appropriate to answer these questions and we included all the women who benefitted from peer counselling in the survey. We needed to understand better the feelings of the women, and so we added some semi-structured questions to the questionnaire to collect more qualitative and quantitative information.

Inclusion of all the supported mothers reduced selection bias. The interviews were done by 2 interviewers, the author and the second peer counsellor supervisor. This could have had a risk of introducing bias by the interviewers, though this was minimised by training on the importance of recording the women's responses verbatim. There was also a possibility of social desirability of answers given by the mothers if they thought they were not supposed to speak ill of the peer counsellors. We tried to minimise this by ensuring the interviews were done in the absence of the peer counsellor.

In this survey, the majority of the supported women expressed satisfaction with the various aspects of the peer counselling for example: usefulness of the peer counselling, acquisition of new knowledge about breastfeeding and feeling respected by the peer counsellors. It was also found that women who received 5 or more visits were more likely to express overall satisfaction with the peer counselling. This could be due to increased understanding of the concepts under discussion with increasing number of visits. The various reasons given by the women for their satisfaction are highlighted in Paper III. These findings have relevance for policy on breastfeeding support for mothers. The things we seem to consider trivial for example "sitting with mothers" during discussions and not showing signs of being in a hurry seemed to be considered important by the supported women. Generally the way the peer counsellors approached the women is likely to have influenced the acceptability of the peer counselling strategy and could offer a lesson for those planning similar interventions.

Mixed methods

The sub-studies employed both qualitative and quantitative methods, hence the mixed methods approach became relevant. The first and second sub-studies were mainly qualitative, while the third was quantitative with a qualitative component. The mixing comes in at the interpretation and discussion stage. The third sub-study has mixing done at

the level of designing, data collection and discussion. With regards to the priority and sequence of mixing, the qualitative was the dominant component and the mixing was done sequentially, and hence was denoted as QUAL → quan.

Using a mixed methods design has served to bring out the views of the women who were supported by the peer counsellors both quantitatively and qualitatively. A large majority of the supported women were satisfied with the various aspects of the peer counselling. In addition, their voices are echoed in the study and this strengthens the argument for recommending the peer counselling intervention as acceptable to the intended beneficiaries. The mixing has also brought greater understanding of the reasons for the supported women to be satisfied with the peer counselling. The seemingly simple, ordinary things like 'peer counsellor sitting with her' or 'finding her at her home' for the counselling sessions seemed to make a difference to the mother's satisfaction with the peer counselling package.

From a glance at the figures, the vast majority of the beneficiary women from the counselling were satisfied with it, but understanding their reasons has added more strength to the study. This makes it relevant for policy makers and planners to learn from what the beneficiaries feel and think, and why they liked or disliked the program. The findings could inform future planning of similar health interventions in similar settings.

Speaking from a purist viewpoint, one could argue that the study could have been entirely qualitative. If this had been done, it would have expressed an in-depth understanding of how the supported women felt about peer counselling. However, this would have raised questions about whether the views of the few women studied in-depth were truly representative of all the women who were involved in peer counselling. This is where the numbers obtained from the bigger sample and the voices of the women have been combined to enhance the results.

One of the benefits of mixed methods research is the opportunity to present a great diversity of views [173]. The voices of the 'minority' were also brought out in the study. These are issues that may not be given much attention when planning health interventions, but yet they contribute to the acceptability of the same interventions and eventually to their success. This has been observed, from the results showing differing views regarding some aspects of the peer counselling intervention. This helps in the scaling-up of peer counselling as the divergent views would still be encountered, except that they would have been anticipated. Such divergent views could also be useful for the policy makers regarding peer counselling.

Mixed methods research is not without its challenges, usually taking a lot of time and being expensive. Observing processes can be time-consuming, just as data analysis of mixed methodologies, and this has cost implications. In addition, a wide range of skills are required to carry out adequately a mixed methods research. This may necessitate a larger team to work on a study, which also has its cost implications. The richness of the data is, however, a reasonable pay off. It is important to consider these issues during the planning stage to avoid unanticipated complications, such as running out of time or funds to complete the study.

Usefulness of the peer counselling intervention

In this intervention, an individual community-based approach where the peer counsellors found the women at their homes was used. The advantages will be discussed briefly, table 6. The beneficiary women felt they had acquired some important information from the peer counsellors about feeding their babies, as highlighted in Paper III. This knowledge was likely to spill over to members of the families of the beneficiary women, since they had been invited to listen during the peer counselling sessions. This approach was useful given that many women in this area deliver at home and hence miss out on the routine health education sessions provided at the health facilities. At the time of this study, there were no community health workers to support women with infant feeding knowledge and skills, and so the intervention helped fill this gap.

Table 6. Strengths and weaknesses of the peer counselling intervention.

Strengths	Weaknesses
<ul style="list-style-type: none"> • Individual approach • Home based approach • Employed familiar lay counsellors from the community • Provided important knowledge about breastfeeding to mothers • Spill over of knowledge to the household members • Improved breastfeeding practices among beneficiary mothers • Filled a gap left by the available health services 	<ul style="list-style-type: none"> • Training of lay counsellors pre-requisite • Follow-up supervision crucial • Expensive • Sustainability a challenge • Focused on one activity

The individual approach used here contrasts with the “group counselling” one that is commonly employed in a hospital setting where a health worker gives information to a group of women together. The group approach has the advantage of giving information to many women at the same time, but the personal touch that comes with the individual approach would be lacking. Some women may not feel free to discuss their personal problems in a group and may therefore not raise them to get assistance. The individual approach may therefore help the shy women to discuss matters more freely with the peer counsellor in contrast to group counselling. This is in contrast to the routine health education sessions at the health units, which usually provide for large groups of women due to the number of attendees.

Meeting the women at their homes by the peer counsellors would have provided an informal environment for them and can be seen as a positive approach. The familiar home environment in which the women received support about EBF could also have facilitated the uptake of the knowledge. This also meant that the beneficiary women did not have to spend time or money travelling to a health facility to access the knowledge. Having to spend money on transport to a health facility to access information about feeding their babies could have been a hindrance to those who could not afford. This could have contributed to the high levels of satisfaction with the peer counselling. This was echoed by the beneficiary

women who highlighted the fact that they were visited at their homes by the peer counsellor as a reason for their satisfaction, as highlighted in paper III. Similar findings were reported in the United Kingdom where the beneficiary women were happy about the informal atmosphere in which the peer counselling was held [96].

The community-based approach would be useful in areas where, for various reasons, many mothers do not have easy access to formal health facilities for delivery and other services, such as in Uganda where on average <50% of the women deliver within the health facility [159] under the care of a skilled healthcare provider. If breastfeeding support is only health facility-based, it would mean that many women would miss out on it.

The approach using community-based lay peer counsellors employed in this study contrasts the health facility-based services using health staff. The use of lay persons for some tasks in the health system is nowadays called ‘task-shifting’, with the advantages of allowing healthcare professionals to do more specialised tasks which could relieve congestion at the health units. Task-shifting may be a way of expanding access in primary healthcare in relation to HIV care [191, 192]. Task-shifting has also been practised in other disciplines where a lower cadre takes on services which are normally offered by a higher cadre of trained healthcare professionals [193]. Lay people play key roles provided they are given appropriate training and supervision [194-197]. The main challenge has been implementation and maintenance of adequate training support, pay for new staff, integration into the healthcare systems, and compliance of regulatory bodies [194]. In this thesis, the community-based peer counselling strategy can be viewed as a form of task-shifting, since the peer counsellors took on a role that is usually carried out by the trained health professionals.

One innovation that could be considered is for the lay counsellors to meet the women in the health units. This would work well where the majority of women deliver from a health facility, but those delivering from home would miss out. This approach could probably be further modified so that the peer counsellors find the mothers both in the health facilities and at the women’s homes. The danger in this approach is that the familiarity and informality associated with peer counsellors finding the women at home might be lost, yet the supported women highlighted it as important in the whole process. The appreciation of the “informality” of the peer counsellors by the beneficiary women has been highlighted in earlier reports [96]. It is also possible that peer counsellors could start considering themselves as health workers or even behaving like them after working in a hospital setting for a time. This could be counter-productive as far as supporting women with breastfeeding as “peers” are concerned, since these women might stop considering them as their peers. The first sub-study for this thesis highlighted the finding that some peer counsellors had an expectation of being trained as health workers (Paper I).

Another aspect to consider during planning and include in the budget of a lay counsellor programme is their remuneration. Since the amount spent on the peer counsellors was modest compared to paying trained health professionals, it still seems to be a cheaper option, especially considering cost savings in the health system by the EBF. This is, however, beyond the scope of this thesis. Similar observation regarding remuneration for the new cadre of workers has been reported earlier [194]

This peer counselling intervention seemed to fill the gap left by the available services in the health facilities. Due to the large number of women attending the health facility and the few health workers available to attend to them, many women are more likely to miss out on some of the services. This leads to some women not accessing appropriate support about breastfeeding when they attend the health facility. This is a gap that was filled by peer counselling intervention that provided the women with knowledge and skills about breastfeeding. The peer counselling also provided an opportunity for re-enforcing knowledge of those who had attended the health facility, but did not gain enough knowledge and skills for EBF.

The importance of follow-up or support supervision for the peer counsellors has also been highlighted in our study. It is common for knowledge to wither with time following training. This calls for repeated refresher sessions to update both knowledge and skills. At the planning stage, an organised system of follow-up and support for the peer counsellors should be included to ensure maintenance of their knowledge and skills, and to keep them motivated [7, 104, 198]. This also has implications on the resources needed to carry this out successfully, as more time is needed to be put into the intervention; but the costs should be weighed against the gains as far as child survival is concerned. It is important to ensure that the supervisory team doing the follow-up has attained skills and knowledge so that they are able to impart them accordingly. The sub-studies used for this thesis have highlighted some important issues for an African setting that is especially relevant to sub-Saharan Africa. There is untapped potential in the communities which could be used to empower them to participate in activities that can help improve the health and survival of their children. In Uganda, the community health worker concept is increasingly being used for the provision of services, e.g. the community management of fever, and such interventions have been hailed as successful and highly acceptable [199-201].

The acceptability of the peer counselling by the community will be influenced by the approach used to introduce it. Using the existing community leadership structures to sensitise the community members about the strategy, e.g. the dialogue held with the community, was important in preparing them for the peer counselling. The community was involved in the selection of the peer counsellors and they had the opportunity to choose those with whom they felt comfortable. This could have given them a sense of ownership of the peer counselling intervention and is well outlined in paper II. It is also important to understand the norms of the beneficiary community so that they are respected during the process. This is where a woman from the community is likely to have a better understanding of how the community behaves and how to avoid any unnecessary clashes that might harm the program. There are some cultural beliefs and practices about breastfeeding which may not be factually correct, but may be considered very important by the community. Some may be mistaken ideas, but the peer counsellors have to approach these very cautiously when they interact with the community. This was an aspect given attention during training to avoid unnecessary antagonism that might easily negatively affect peer counselling intervention.

For the purposes of planning a similar intervention, it is important to understand where the women go and what they do during the time around childbirth. Many women moved from

their homes around childbirth to get social support from their parents. Anticipating such moves would help one to plan with the woman before delivery so that she keeps in contact with the peer counsellor in order not to miss visits. This, however, may not be a generalisable phenomenon, hence the importance of understanding the community being targeted.

The fact that the peer counsellors sat with the beneficiary women seemed to make them feel free to discuss and voice their concerns to the peer counsellors. This scenario contrasts with what happens in education sessions in health units where health workers have been trained to handle sessions in a formal manner, an approach that may be intimidating to some women from humble social and educational backgrounds. Similar findings have been reported from high income countries where beneficiary women appreciated the social interaction and informal approach by the peer counsellors more than the actual knowledge obtained, although they considered the knowledge important [96].

The spill-over of knowledge could have occurred even beyond the household level. Some women felt empowered to first help their friends with breastfeeding before referring them to a peer counsellor, as highlighted in Paper III. This is a positive development from the intervention, since women usually tend to first discuss their problems with friends and family before seeking help from health workers. In the case of infant feeding, the beneficiary women are likely to share the correct information about infant feeding with their friends. It is important that the women are able to impart the correct information they were given so that so that they do not pass on wrong information to their friends.

One outstanding advantage of peer counselling intervention has been the increased EBF levels among the beneficiary women. The fact that women in the peer counselling group were twice as likely to practice EBF at 12 and 24 weeks of their infant's age than their counterparts in the control group shows that peer counselling helped mothers to practice EBF (appendix 4). Many women felt happy with having been helped by the peer counsellors to EBF their babies. They kept comparing their current breastfeeding experience with the previous ones, and felt they had done better with the help of the peer counsellor.

Some women alluded to their children being healthy and not falling sick as frequently as on previous occasions, as discussed in paper III. Having a healthy child as a result of peer support could have contributed to increasing its popularity, with most women recommending it for other women. From the perspective of the beneficiary women, this was something tangible they felt had resulted from the intervention. This is an important advantage one has to consider even as the costs of the intervention are discussed. Having healthy children may not only be beneficial to the mothers and their families, but also to the health system as a whole due to reduced hospital visits and expenditure on health. However, the costing of this intervention is beyond the scope of this thesis.

Peer counselling intervention had some shortfalls. In the current study, follow-up of the peer counsellors was carried out by a highly trained and specialised team in a study setting, a scenario that may be difficult to duplicate on a larger scale. This made it an expensive intervention that may be difficult to replicate under programmatic conditions.

For the successful implementation of this intervention, training of the peer counselling is crucial. In the current intervention, the peer counsellors' were taken through a 6-day intensive residential training since they came from rural communities where transport was unreliable. This led to increased costs of the training. On the other hand, this was advantageous since the peer counsellors had the opportunity to interact with each other outside class hours and discuss some of the difficult topics handled during the day. The peer counsellors had not had prior experience attending residential workshops, which turned out to be a motivating activity for them. This could have contributed to their motivation to continue with the peer counselling through to the end of the study.

The peer counsellors had to be followed-up and supervised closely in order to reinforce their knowledge and skills throughout the study period. This also contributed to the expenses of the intervention. This raises the issue of sustainability of this intervention on the basis of the costs involved. In the set-up of this intervention, each peer counsellor was checked at least once every 2 weeks, observed counselling a mother once a month, and had to attend meetings with all the peer counsellors and supervisors each month. As a way of minimising costs, the monthly meetings might be reduced to once every 2 months. However, care should be taken not to compromise quality in an effort to cut costs.

In this thesis, the peer counselling package used comprised of 5 peer counsellor visits to each mother, with one taking place before the woman delivered. The next 2 visits during the first and fourth week following childbirth were fairly close to each other since most women needed the support with their breastfeeding in the first weeks after childbirth. It was observed that the women who received 5 or more visits were more likely to show overall satisfaction with the peer counselling (Paper III). Since the peer counsellors were imparting knowledge and skills about breastfeeding to the mothers, these were likely to improve with increasing visits. The challenge remains with the practicalities of implementing 5 peer counsellor visits to each mother under programmatic conditions on a wide scale. It has been previously noted that the intensity of counselling influences its cumulative benefits with increased frequency leading to increased adoption of EBF [10, 47]. This emphasizes the importance of balancing the intensity of counselling with the outcome, while considering ways of reducing costs. The long-term sustainability of peer counsellors on a wide scale remains undetermined [198].

This peer counselling intervention was a single channel programme that focused on supporting women to EBF their infants, which could have contributed to its success. Similar findings have been reported earlier where the success of the peer counselling was attributed to the concentration on one activity, namely, support of breastfeeding [7, 10]. One way of ensuring sustainability would be integration of the counselling for EBF into the existing systems, such as the community healthcare workers who are already in place. This would then raise the challenge of how effective the community health worker would be if they given the additional task of supporting women to breastfeed successfully in addition to their other functions. Such a worker with more functions is likely to place less emphasis on the support for EBF as they try to prioritise their activities, which could affect the results negatively.

The concept of novel approaches and continuing innovation has been proposed by Bhandari and colleagues [198] as a possible way of sustaining scaled-up programmes. This could work as circumstances change and there is a need for innovations to keep up with such changes. The experiences we obtained from the first sub-study were useful in the planning and implementation of the PROMISE-EBF trial in Mbale.

Usefulness of the thesis sub-studies

This thesis has focused on peer counselling for EBF in a largely rural setting in a region of Uganda. This makes it a highly context-specific research, but the lessons learnt from this study may prove useful in most other settings. Even if the context is different, the same issues are likely to be important, despite the solutions being different. Of course, in similar settings, solutions from this study may be applicable. Specifically, this may be true in most Ugandan settings. This is especially so, since most of the Ugandan population lives in rural set-ups with similar characteristics [159]. The findings could also be applicable in most Sub-Saharan countries where the majority of the population lives in rural set-ups. However, even in high income countries where peer counselling operates, the supported women have appreciated the support they received [96, 129, 130]. What is important is that the method of implementation should be relevant to the setting.

Limitations

The limitations of the different sub-studies have been discussed in the appropriate papers and will not be repeated here. Notwithstanding, the studies for this thesis were done within a randomised controlled trial and the study procedures had to be followed. The number of peer counsellors was small and there was no comparison group which would have helped us to understand better how the women in the group with no exposure to peer counselling might have felt. The findings in this study depended a lot on recall, which raises the problem of recall bias. This may introduce errors, especially when the recall period was long. The same questions were asked at the different follow-up visits, which made it possible to cross-check the responses.

Another limitation is the number of women who were lost to follow-up, as these could introduce a selection bias, which could happen if those lost to follow-up were different. This was especially important for sub-study III. When the characteristics of the women included and those excluded in the analysis were compared, there was no significant difference between the 2 groups, indicating that there was no selection bias. One could therefore state that the analysed sample for sub-study III was not biased. Furthermore, the number of women analysed regarding their satisfaction with the peer counselling was large enough to give a fair representation of the studied women.

The team that carried out the peer counselling intervention was also involved in the assessments of the women's experiences towards the peer counselling. This presented the challenge of introducing bias, but attempts were made to minimize it by thorough training and verbatim recording of the women's responses. Another limitation was that the interviews were not tape-recorded, as this would have ensured that the exact words the women used were captured. Some attempts were made to minimize errors. The coding

process involved members of the study team not directly involved in the intervention, and consensus was reached regarding the codes.

Conclusions

Systematic planning and implementation of the peer counselling intervention for EBF was useful in making it acceptable to the community. Peers showed a huge potential for breastfeeding support and this was highly accepted among the supported mothers. In this rural Ugandan community where infant feeding decisions are made in consultation, notably involving other members of the family especially the fathers and grandmothers during the process of peer counselling, is likely to improve the desired behaviour of practising EBF. In case of scale-up of this intervention, the main points to emphasise include: community involvement, proper training using an appropriate, culturally sensitive curriculum, and effective support supervision for the peer counsellors.

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