Complementary Feeding Perceptions and Practices in the Light of the Health Belief Model
A Qualitative Study in Rural Uganda
Infant undernutrition with associated diseases is a leading cause of under-five deaths globally, causing 45% of child deaths. A critical point for the nutritional status of the infant is the time when the first foods are introduced in addition to breastfeeding, i.e. complementary feeding. Based on prior research, complementary feeding practices are inadequate in East Africa, including Uganda. Particular concerns are the not timely introduction of complementary foods and low dietary diversity of children under two years. Complementary feeding is a complex set of behaviours. Good complementary feeding comprises, in addition to nutritious food itself, the feeding moment, technique and style. The promotion of good complementary feeding practices therefore demands multiple approaches. The aim of this study was to explore complementary feeding perceptions and practices in the context of the Health Belief Model (HBM) and to gain understanding on how to promote health behaviour change for better complementary feeding.

The study was carried out in the rural area of Kirewa, Uganda. All together 9 focus group discussions (FGD) were held for caretakers of children under two: mothers, fathers, grandfathers and grandmothers. A set of educational videos on infant care and feeding practices, the GloCal-videos, were used as a projective tool in the FGDs. In addition, one individual interview with the local health care worker was conducted. The data from the FGDs and the interview were analysed with a deductive content analysis method based on the HBM.

The findings from this research demonstrate that complementary feeding practices among the study participants were suboptimal in relation to timing, dietary diversity, consistency and feeding frequency. The importance of complementary feeding as a health behaviour preventing malnutrition and stunting was not understood among these Kirewan caretakers. The findings from the HBM based analysis suggest messages about the susceptibility of children to detrimental consequences of poor feeding and their seriousness should be targeted to caretakers. Based on this study, the GloCal-videos may work as cues to action for better complementary feeding practices.
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Abbreviations and Definitions

DHS Democratic and Health Survey
FAO Food and Agriculture Organization of the United Nations
FGD Focus Group Discussion
HBM Health Belief Model
HIV Human Immunodeficiency Virus
IDI Individual Interview
IYCF Infant and Young Child Feeding
1 Introduction

Childhood malnutrition remains a global health burden, affecting the lives of millions of children, causing lifelong complications and personal as well as economic loss. Consequently, infant care and feeding have become a high priority in scientific research and global development programmes. Promoting better complementary feeding practices is a requisite to achieve adequate infant feeding globally. Prior research has proven health behaviour change theories effective in complementary feeding promotion. This study explores, how the Health Belief Model (HBM) can be applied to complementary feeding promotion in Kirewa, rural Uganda, and whether the use of the HBM reveals underlying determinants of poor complementary feeding that could be targeted with future programs.

1.1 Complementary feeding and the scope of childhood undernutrition

The first two years of a human being are a critical window of opportunity to affect health and development later in life (1,2). This is a period for rapid growth, development and learning, among other things, learning to eat solid foods. Exclusive breastfeeding is recommended for the first six months of life (2). The switch from breast milk to solid foods should and does not happen in one night, but through a process called complementary feeding. Adequate complementary feeding is a requisite for healthy growth and development (2). On the other hand, infants are most prone to undernutrition during the first two years of life which is the period of complementary feeding (3).

Childhood undernutrition with associated diseases is a leading cause of under-five deaths globally, causing 45 % of child deaths (3). In Eastern Africa, there is an urgent need for infant and child nutrition promotion (3). The prevalence of childhood underweight is high, as 28 % of under-fives are underweight and as much as half are stunted in East Africa (3). In Uganda, the corresponding figures in 2016 were 11 % for underweight and 29 % for stunting among children under five years old (4).

These alarming figures may be at least partly explained by the poor complementary feeding practices in the region. The DHS data from East Africa reveals that complementary food diversity is incomplete, meal frequency is insufficient and complementary food is introduced too late (5).
However, there has been positive development in maternal and child health in Uganda in the past years (4,6). Stunting prevalence of children under five has declined from 45% in 2000/2001 to 29% in 2016 (5,6). Nevertheless, maternal and child health remain a big challenge. When compared to the DHS of 2006, a smaller proportion of infants were fed as recommended in Uganda in 2011 (7). Particular concerns in infant feeding are the not timely introduction of complementary foods and the inadequate dietary diversity of complementary foods (7).

1.2 Complementary feeding in the context of health behaviour change

Complementary feeding can be regarded as a health behaviour preventing malnutrition (8). Considering complementary feeding as a health behaviour allows us to examine changing complementary feeding practices in the context of changing health behaviour. A myriad of theories has been suggested to explain health behaviour and the process of changing it, such as the Health Belief Model, The Social Cognitive Theory and the Theory of Planned Behaviour (9). The issue seems not to be the scarcity of appropriate theories, but which one and how to use them (9-11). Questions on how health behaviour theories could be tested, developed and applied most efficiently in interventions studies have been demanded lately (10,12).

This study applies one common health behaviour theory, the Health Belief Model (HBM), to a qualitative complementary feeding context in a resource poor setting. The complementary feeding practices and perceptions of Kirewan caretakers will be analysed based on the HBM. The HBM has not been previously used in a qualitative complementary feeding study and therefore this study provides an important novel application of the theory.

Promotion of good complementary feeding practices will not succeed only by picking an appropriate health behaviour theory. Good complementary feeding is a complex set of behaviours, comprising, in addition to nutritious food itself, the feeding moment, technique and style. Health education interventions have been found effective in enhancing complementary feeding practices (13). One promising approach in complementary feeding education seems to be educational videos (14). Using videos as a media for health education has had promising results in short-term health behaviours, especially in self-care practices (15).
This study will incorporate the educational GloCal-videos into the research design. The GloCal-videos have been produced by the GloCal research team, a joint effort of the University of Helsinki, the Ministry of Health in Kenya and Unicef (16). The videos were tested in collaboration with The Kenyatta University in Kenya. The aim of the GloCal-concept is to support the health and nutrition of families, regardless of location, literacy and available means.

The aim of this study is to apply the HBM to explain Kirewan caretakers’ perceptions and practices on complementary feeding. The educational GloCal-videos produced in Eastern African context will be used in the study design.
2 Literature review

Nutritional needs of an infant below the age of six months can be solely met with breast milk, given that the mother is not malnourished (2,17). Exclusive breastfeeding for six months not only gives the infant all nutrients needed, but also delivers the child immunoprotective non-nutrients that help to establish the immune defence (2,18). Thus, exclusive breastfeeding prevents infantile gastrointestinal infections along with other infectious diseases, also because in developing countries all other feeding options may be dangerously unhygienic (2,18). Breastfeeding after six months alongside with complementary feeding is recommended since it still provides a steady source for many nutrients (17). In addition, continued breastfeeding may have far-reaching benefits for the child as it has been shown to lower the risk for type 1 diabetes and childhood obesity (18).

2.1 Complementary feeding

Breastfeeding cannot solely meet the demands of a growing child after six months (17). Therefore, the first foods should be introduced to the infant at six months (2). The first foods are called complementary foods to illustrate that the foods and drinks are given to the child in addition to breast milk from the age of six months (2,19).

Starting complementary feeding after exclusive feeding with sterile breast milk poses many risks to the nutritional status of the child especially in poor environments (20). The complementary foods given to the child may be of poor nutritional quality or unhygienic, predisposing the child to food- and water-born infections (20,21). Inadequate quality and quantity of food as well as poor child-feeding practices together with unhygienic food preparation form a severe risk to undernutrition and related illnesses (2). If nutritionally appropriate complementary feeding is not started at six months, the child becomes undernourished, which can lead to stunting and poor cognitive development (3).

The World Health Organisation (WHO) has published a guideline for complementary feeding for both breastfed and non-breastfed children (2). The guideline for breastfed children is referred to when defining good complementary feeding in the present study. The WHO guidelines examine all the aspects of good complementary feeding, including the biological component of what is being
fed, as well as the behavioural component of by whom, when, where and how complementary feeding is practiced. These behavioural practices have been shown to be important determinants for infants’ nutrient intake (22). The WHO guidelines for complimentary feeding are summarised in table 1 below.

Table 1. Summary of WHO’s guiding principles for complementary feeding of the breastfed child (2003)

<table>
<thead>
<tr>
<th>Topic</th>
<th>WHO guideline</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exclusive breastfeeding</td>
<td>Practice exclusive breastfeeding until 6 months.</td>
<td>Benefits for mother and child, especially the enforcement of child’s immune defence.</td>
</tr>
<tr>
<td>Continuing breastfeeding</td>
<td>Continue breastfeeding until 2 years.</td>
<td>Breast milk remains an important source of nutrients. Breastfeeding may have longer term health benefits, such as preventing childhood obesity.</td>
</tr>
<tr>
<td>Time of introducing complementary foods</td>
<td>Introduce complementary foods at 6 months</td>
<td>Breast milk cannot meet growing demands of nutrients beyond six months. Introducing complementary foods earlier is risky especially in poor conditions. At six months the child is physiologically developed for other foods than breast milk.</td>
</tr>
<tr>
<td>Feeding practices</td>
<td>Practice responsive feeding</td>
<td>An active feeding style may upgrade dietary intake</td>
</tr>
<tr>
<td>Safe preparation and storage of complementary foods</td>
<td>Practice good hygiene and proper food handling</td>
<td>Hygienic practices prevent gastrointestinal illnesses especially prevalent upon the introduction of complementary foods.</td>
</tr>
<tr>
<td>Amount of complementary foods</td>
<td>Start complementary feeding with small portions and continue frequent breastfeeding. Gradually increase the size of portions.</td>
<td>Amount of food should be determined by responsive feeding.</td>
</tr>
<tr>
<td>Consistency of complementary foods</td>
<td>Consistency of food should be pureed, mashed or semisolid at 6 months. The food consistency should evolve so that at 8 months the child can eat finger foods and at 12 months family food.</td>
<td>The ages are based on normal children’s development. Food consistency should follow the child’s capabilities so that the child eats enough, and the consistency directs the development of eating skills.</td>
</tr>
</tbody>
</table>
Meal frequency and energy density

Increase meal frequency as child grows. Frequency depends on energy density and size of meals, but as an average for a breastfed child the following is recommended:
- 2-3 times / day at 6-8 months
- 3-4 times / day at 9-24 months with 1-2 nutritious snacks as desired

Based on average breast milk consumption. If breast milk intake is lower, the energy density of foods is low or intake per meal is small, increase frequency. Too frequent feeding may replace breastfeeding and is not recommended.

Nutrient content of complementary foods

Ensure that the child eats a variety of foods to meet the nutrient requirements. Include animal-based foods in the diet. Vitamin A rich fruits/vegetables should be eaten daily. Vegetable fats are important in providing adequate fat content to the diet. Avoid nutrition-poor drinks.

Need of nutrients is high due to rapid growth. All micronutrients cannot be provided by a plant-based diet. Fats are important in providing essential fatty acids and for enhancing absorption of fat-soluble vitamins. Too much fat should not be added to complementary foods, because it decreases the energy density of other nutrients.

2.1.1 Importance of good complementary feeding

Good complementary feeding is essential for the physical and mental growth and development of the infant (2). Consequently, poor complementary feeding results in malnutrition which causes shorter and longer-term complications (3). The WHO guiding principles for complementary feeding list poor practices of breast- and complementary feeding as one of the main causes for infant malnutrition (2).

Malnutrition is a broad term for all suboptimal nutritional statuses, including different forms of undernutrition as well as overnutrition (23). Undernutrition can be classified to four sub-forms: wasting, stunting, underweight and vitamin and mineral deficiencies, the so-called silent hunger (23). The four sub-forms of undernutrition are defined as follows by the WHO (24): Wasting signifies a low weight compared to height and is a sign of acute undernutrition. Stunting signifies a low height compared to the age of the child and is a sign of chronic undernutrition. Underweight signifies a low weight compared to age and may be a sign of acute or chronic undernutrition or both.
The exact definition for wasting, stunting and underweight is that the infant’s height or weight is more than 2 standard deviations below the corresponding WHO Child Growth Standard’s median (24). These deviations are illustrated in z scores, which depict the amount of deviation compared to WHO’s growth standards (25).

Vitamin and mineral deficiencies are defined in accordance with cut-off values for the micronutrient in question (24). In a global scale, the most challenging micronutrient deficiencies are vitamin A, iodine and iron deficiencies (3).

To prevent malnutrition, complementary foods should be timely and properly fed, adequate and safe, as presented in the summary of WHO’s guiding principles for complementary feeding above (26). Initiating complementary feeding before the recommended six months of age poses a risk for infectious diseases which tend to lead to undernutrition, especially in developing countries (27). Before six months of age, the gastrointestinal tract of the child is not yet developed to digest other foods than breast milk (2). Therefore, nutrients from complementary foods may not be efficiently absorbed (28). Moreover, infants younger than six months do not yet master masticating and swallowing and thus feeding solids may present a choking hazard (27). If complementary foods are started too early, the nutrient intake of the under six-months-old decreases because complementary foods replace breastfeeding (2). Even after six months, complementary foods should be given right after breastfeeding to ensure they do not replace breast milk too early (27).

Initiating complementary feeding later than at six months is also detrimental, since from there on the nutritional needs cannot be met with breast milk solely (2,27). Breast milk is low in some micronutrients (vitamin A, iodine, iron, zinc), if their maternal status and intake is inadequate (3,27). During exclusive breastfeeding the child depends on antenatal stores for some of these nutrients (27). However, with vitamin A the antenatal stores are small, and the infant’s intake of vitamin A depends entirely on the concentration in breast milk (3). The antenatal nutrient stores of the infant have mostly diminished by six months and therefore prolonged exclusive breastfeeding may cause deficiencies (27).

Optimal complementary feeding complements the nutrients provided with continued breastfeeding (27). Several issues need to be considered to ensure enough nutrients and energy is provided with complementary feeding: the amount, nutrient- and energy density of foods and
feeding frequency must be appropriate and the consistency of the food should be adapted to the capabilities of the child to ensure sufficient eating (2).

Energy- and nutrient density is especially important in the infant diet because infants can eat only a limited amount at a time due to their small gastric capacity (2,29). Thus, it is crucial that these limited amounts of food are of good nutritional quality. This is also why frequent feeding is important. Food consistency needs to be adapted to the child’s age since the child may eat less than required if food consistency is inappropriate (2). Complementary food consistency should also provide the child challenges to develop eating skills in the form of lumps and finger foods, for example (27,30). Introducing foods with appropriate challenges for eating prevent eating difficulties later in infancy (30).

Hygienic practices are always vital when preparing food, but particularly in complementary feeding because the infant is accustomed to sterile breast milk prior to the introduction of complementary foods (27). Although breastfeeding supports the development of the immune function, infants are prone to food- and waterborne infections (3,27). Gastrointestinal infections may lead to acute malnutrition, because appetite and absorption are lower and nutrient demands higher during diarrhoea (2,31). If infections are recurrent, a vicious circle of infections and malnutrition may follow, because malnutrition further weakens the immune function, predisposing the infant to subsequent infections (2,32).

Even if all other complementary feeding practices are optimal, but the feeding style is inappropriate, the nutrient intake may be compromised (22). A passive feeding style, the so called “laissez-faire” practice, may not enable the infant to eat enough, since the child is not encouraged to eat (2,22). Another inappropriate feeding style is the controlling style, sometimes associated with forced feeding (22). With a controlling feeding style, the infant may not evolve self-regulation for eating which can distort eating behaviour later in life (22). Responsive feeding, on the other hand, enhances the child’s own satiety control which impacts the development of a healthy eating behaviour, ideally lasting throughout life (33).
2.1.2 Stunting and its consequences

Chronic undernutrition in infancy results in stunting and an increased disease burden and mortality (3,27). Stunting remains a global health challenge, as the global prevalence of stunting was estimated at 22.2% in 2017 (34). Nevertheless, the severity of stunting is seldom recognised in resource-poor communities, where omnipresent stunting has made children short of stature a norm (35).

Stunting is rooted in the vicious circle of malnutrition and recurrent gastrointestinal infections (36). Catch-up growth can stop this cycle and overturn the detrimental effects of gastro-intestinal infections on growth (27). However, catch-up growth is minimal if infections are recurrent (37). In addition, the higher nutrient and energy requirements during catch-up growth cannot be met with routine complementary feeding but must be met with additional food and breastfeeding (2). If the nutritional needs for catch-up growth are not met, the child’s growth retards permanently (37). This is the case with the majority of stunted children who remain stunted for their whole life (36).

Though the process of stunting may initiate already in utero, under two-year-olds are at the greatest risk for stunting, because the growth rate of an infant is at the highest during the first few months of life (3,38,39). More specifically, the growth faltering that leads to stunting has been estimated to occur from three to 24 months (35,40). This demonstrates that complementary feeding must be started at six months of age and underlines the necessity of good quality complementary foods and feeding practices (41).

Figure 1 below illustrates the timing of growth faltering (41). The figure depicts mean weight for age (WAZ), weight for length (WHZ) and height for age (HAZ) z scores relative to the WHO growth standards for children aged 1 to 58 months. The data is combined from 54 studies. The blue line marks how height for age is below the standard already at one month and decreases rapidly thereafter until 24 months. The timing of growth faltering emphasizes the importance of adequate nutrition during pregnancy and thereafter, especially when starting complementary foods at six months (41).
Stunting not only reduces the linear growth but impedes development in all functions, including motor and cognitive skills (42). Stunting also predisposes children to a greater risk of death from infectious diseases (42). In fact, stunting per se does not cause these developmental deficits but they originate from the same psychosocial and biological deprivation caused by poverty-driven malnutrition and insufficient care (36,38). Stunting is recognized as the best marker for these multiple developmental deficits (35).

In addition to growth faltering and poor brain development, malnutrition before and during the first two years has other long-term consequences in adolescence and adulthood (1). In their article, Victora et al. (1) used childhood growth as an indicator for undernutrition. Based on previously published and their new analyses, Victora et al. (1) concluded that childhood undernutrition is associated with poorer educational achievements, smaller adult income and lower birthweight of offspring. This implies that the impairments in linear growth and brain development often last permanently and may affect even following generations (1,38).

There is also suggestive, yet insufficient, evidence from developed countries that chronically undernourished children are in greater risk for some non-communicable diseases later in life, such
as type 2 diabetes and cardiovascular disease (1). The consequences of undernutrition are inter-
generational as shown by the association of maternal body size with offspring body size. Victora et 
al. (1) suggest that the detrimental effects of undernutrition may extend even over three 
generations.

2.2 Determinants of complementary feeding practices

In the following section some factors which contribute to inadequate complementary feeding 
practices in resource poor settings will be discussed. Most of these factors are related to 
multidimensional poverty which covers human development outcomes, insecurity, vulnerability, 
powerlessness and exclusion in addition to the commonly understood economical poverty (43).

2.2.1 Food insecurity

Household food insecurity and lack of water have been discovered as barriers to meet 
international recommendations for infant and young child feeding practices in developing 
countries (44). Food insecurity and associated famine is tormenting East Africa in particular: an up-
to-date report concerning the state of food and agriculture in Africa points out that East Africa has 
had the highest prevalence of undernourished people during the whole 21st century (45). The 
prevalence has not decreased since 2010 and might even be in rise, estimates the Food and 
Agriculture Organization of the United Nations (FAO) (45).

The report of FAO (45) suggests that climate change, conflicts and a difficult global economic 
situation are the roots of this negative trend in food security. Detrimental climatic and 
environmental conditions in East Africa, such as the El Niño phenomenon in 2015 and 2016, 
resulted in meagre harvests and damage to livestock, thus causing food insecurity (45).

Food insecurity afflicting especially the small but numerous subsistence farmers in Uganda and the 
whole of East Africa is not a new challenge (46). Andersson and Gabrielsson (46) state that the 
poor productivity of these small-scale farmers is further decreased by soil degradation, constraints 
of arable land, low profits from market, plant diseases and climate change. In addition to poor 
productivity, agricultural trends of growing monotonous cash-crops not directly providing food for 
the farmer may restrict dietary diversity in Uganda (38).
Although food insecurity is a huge challenge in East Africa, there are some promising attempts to secure food availability. Andersson and Gabrielsson (46) described the role of small-scale farmers’ cooperation in sharing risks and combining labour force to promote crop diversity, preventive activities and conservation of resources. These co-operative organisms may intensify agricultural methods sustainably, thus improving food security (46). The FAO report (45) also names farmer organisations as one way to achieve better food security and adds the rise of information technology, such as smart phones, as an opportunity to share best practices between small-scale farmers.

2.2.2 The status of women

Rural women have been reported to suffer most from the negative effects of climate change to agriculture and food security (47). This is due to the lack of agricultural resources, not focusing climate change adaptation strategies on women and the already high work load of rural women, who are often responsible for child care, water collection and cooking in addition to agricultural tasks (47,48).

Though increasing agricultural productivity is necessary to tackle food insecurity, it might further decrease women’s caregiving capacities in resource-poor areas, where most of the agricultural work falls on the shoulders of women (49). Considering the numerous tasks of rural women, it is no wonder studies in Bolivia and Uganda found that women perceived lack of time due to the amount of agricultural work as one major barrier for improved child feeding (49,50). In Uganda, the burden of other responsibilities constrained infant feeding frequency and breastfeeding duration (50). Likewise, a study in India noted that mothers’ work for income during their child’s infancy may restrict good complementary feeding (51). What is more concerning, mother’s workload during the infancy of their offspring has been shown to increase globally (51).

One reason explaining women’s workload is the lack of male involvement in child care activities. Nankumbi and Muliira (49), Ickes et al. (50) and Jones et al. (52) all found the lack of father’s involvement in child care a barrier for good child feeding. Ugandan mothers in the study of Nankumbi and Muliira (50) revealed that support from husbands was minimal or non-existent, both in infant feeding or helping in other tasks of the mother.
Similarly, mothers in the Bolivian Andes also lacked support from their husbands and relatives (49). Furthermore, husbands, relatives and in-laws were reported to reinforce culturally designated family roles which thrust infant care and feeding solely upon the mothers’ shoulders. Poverty, lack of education, gender norms, men’s lack of interest in child care, and the consequent failure to integrate men in community child care initiatives, all explained why mothers missed support from the family in infant care and feeding (49). In contrast, support from the entire family to practice complementary feeding as recommended has been found a facilitator for recommended feeding behaviours (44).

In the study of Ickes et al. (52), the participants explained that the major role of mother in child care is due to men being absent from home and that child care is culturally regarded as women’s work. The mothers in Ickes’ study hoped that fathers would participate in childcare but simultaneously doubted their childcare skills. Yet, Ickes et al. revealed some promising perceptions in relation to men’s involvement in child care: men in the study thought fathers could participate in childcare “in these modern times”. Those men, who knew more than their wives about child feeding, felt more responsible to make sure the child is well fed and supported the mother. Mothers perceived father’s involvement in childcare important for the child and a possible trend in the community.

Though the burden of household and agricultural work is often heavier for women, their access to resources and opportunities, such as land, livestock, education and technology, is restricted compared to men (53). Women’s restricted financial autonomy was found a determinant for poor infant feeding in a review of qualitative studies (44). Parallelly, women in the study of Ickes et al. (52) perceived financial autonomy obligatory for appropriate child care. Participants in the study reported that men are the principal earners and users of money, who spend the money first on themselves. Men saw a high degree of women’s financial autonomy as a threat, yet women were told to have the authority in financial decisions related to food purchases. This might be because men estimated women more experienced in food purchasing and preparation (52).

Related to women’s status in the community, Ickes et al. (52) discovered that early marriage and childbearing were barriers for mothers to provide adequate care for children. Mothers in the study stated that younger mothers would provide less appropriate care for infants due to lack of experience, support and resources. Another disadvantage of early marriage was that it positioned the wife in an inferior status in the husband’s family. Mothers-in-law were told to have opposing
views of breast- and complementary feeding compared to recommendations and could, for example, tell the mother to give foods to the baby before six months. Participants in the study explained that whether the mother could oppose the mother-in-law’s opinion depended on her age and status: older mothers’ opinions were respected more than younger’s.

In addition to early marriage, Ickes et al. (52) also found polygamous marriage a barrier for appropriate infant feeding practices. Polygyny was reported to constrain mother’s feeding capabilities because it reduced financial support from the husband and decreased his time and interest to participate in child care.

Marriage at an early age and being a co-wife in a polygamous marriage both stem from the weak empowerment of women, as well as women’s lack for reproductive decision-making. Mothers’ lack of reproductive decision-making may lead to closely spaced pregnancies, which was found to restrict maternal capabilities for child feeding in the study of Ickes et al (52). Participants in the study reported that men have the utmost decision-making power in family size. Yet, the responsibility for child care is on the shoulders of mothers. A promising finding from the study of Ickes et al. (52) is that a big child count is not seen as a sign of prosperity anymore. Instead, men in the study pronounced the ability to take care of the family as a major determinant for family size.

2.2.3 Beliefs, knowledge and education

Adverse cultural beliefs related to infant feeding formed a significant barrier for infant feeding in the study of Nankumbi and Muliira (50). This was especially because the beliefs were reinforced by the elders and influential members of the community. Similarly, adverse beliefs about child’s hunger and adult food not being suitable for infants were found as barriers in India (51). Likewise, adverse beliefs emerged as a barrier for infant feeding in the review of Bazzano et al. (44). The effect of adverse beliefs on complementary feeding practices are supported by the research of Hadley et al. (54) who presents that mothers’ perceptions can predict the actual child feeding practices.

Interestingly, Engle (51) points out in her research article that not recognizing the lack of feeding and care practices as the main cause for malnutrition is one of the major barriers for appropriate infant and young child feeding in India. Instead, lack of food is seen as a main cause for
malnutrition. Engle (51) agrees that the lack of food is one cause for malnutrition but providing food aid alone does not enhance the situation if inappropriate infant feeding practices are not fixed.

Findings from several studies in resource poor settings demonstrate that caretakers seldom understand the importance of proper infant feeding practices or the severe consequences from poor feeding practices (55-59). Yue et al. (55) found that rural Chinese caretakers did not understand the meaning and causes of malnutrition nor did they understand the importance of adequate feeding for prevention of malnutrition. Similarly, a study in Madagascar showed that mothers had not grasped the meaning of malnutrition or how it could be prevented (56).

Related to misunderstanding the malnutrition and its prevention, caretakers may have challenges recognizing malnutrition even in the case of their own child (57,58). Yet, Madagascan mothers in the study of Asgary et al (56) were worried for their child not receiving a diverse diet, since it could cause sickness or malnutrition. In contrast, another study in Madagascar found that most mothers did not worry about the nutritional quality of food nor did they worry about malnutrition (59). Yue et al. (55) estimate that the misconceptions related to malnutrition and complementary feeding are due to poor sources of knowledge and relying on own experiences or those of relatives.

One issue explaining the persistence of adverse beliefs related to infant feeding may be the lack of education. In their combined analysis of the Demographic Health Survey (DHS) data from Kenya, Tanzania and Uganda, Gewa and Leslie (5) found that post-primary education of the mother and at least four ante natal care visits (only in Kenyan and Tanzanian data) were associated with children’s adequate dietary diversity (5). Ickes et al. (7) analysed Ugandan DHS data from 2006 and 2011. They found that poor literacy skills of the mother were associated with not meeting the complementary feeding recommendations (7).

Out of Uganda, an analysis of the DHS data from four West-African countries: Ghana, Liberia, Nigeria and Sierra Leone described determinants of suboptimal complementary feeding (60). Children whose mothers had not attended antenatal clinics were associated with not being introduced to complementary foods. Likewise, children, whose mothers were illiterate were associated with non-introduction of complementary foods. Restricted access to media was associated with low dietary diversity, meal frequency and minimum acceptable diet in the West-African countries examined. In addition, father’s education might play a role in complementary
feeding status, as in the Nigerian data children of non-educated fathers were associated with not being introduced to complementary foods (60).

Primary caregivers’ inadequate knowledge of breast and complementary feeding was identified as a major barrier for adequate complementary feeding in Uganda in the qualitative analysis of Nankumbi and Muliira (50). Parents’ education, both as former schooling as well as counselling related to child care, proves to be an important determinant of infant feeding and nutrition (61, 62). Maternal education particularly is associated with the nutritional status of the child (63). In their study in Ethiopia, Shirima et al. found that knowledge about breastfeeding was one of the only factors associated with the duration of exclusive breastfeeding, unlike the socioeconomic, demographic and biological variables studied (64). Correspondingly, mothers’ understanding of the significance of appropriate complementary feeding and the guidance and counselling given at healthcare facilities were mentioned as facilitators for recommended feeding behaviours in the review of Bazzano et al. (44).

2.3 Complementary feeding as health behaviour

Conner and Norman (65) define health behaviour as behaviour patterns that contribute to overall health and well-being either by enhancing or compromising it. They also suggest the definition of health behaviour to cover behaviours aiming at preventing or detecting a disease (65). With this definition, complementary feeding may well be considered as health behaviour, since good complementary feeding both enhances the health and well-being of a child and prevents malnutrition and associated diseases. Considering complementary feeding as a health behaviour allows us to examine changing complementary feeding practices in the context of changing health behaviour, which has been a topic of intense scientific research and theoretical work for decades (9,10).

Targeting health behaviour change has great potential for restraining global health problems, such as infant malnutrition (66). Yet, health behaviour change is not a simple task. According to Michie et al. (66) health behaviour change requires modification of at least one of the following: capability, motivation or opportunity for the activity. How these elements then can be affected is the focus of health behaviour theories.
Health behaviour is complex by nature and theories can provide a means to structure this complexity (66). Another virtue of theory use in health behaviour research is that it builds generalizability for study findings as the explanations and predictions from theories are based on previous scientific work (67). Review studies have suggested that theory-based health interventions are more efficient in changing behaviour than those not founded on theory (10,12).

However, there are also contradicting findings from theory use regarding intervention effectiveness (66). These inconsistencies underline the challenges with using behaviour change theories: how to operationalize theories consistently, how to report theory use adequately in research articles and how to ensure the theory used is relevant for the health behaviour in question (66,68,69). These challenges have been recognized by several researchers. Painter et al. (10) as well as Bishop and Glanz (12) demanded scientific evidence on testing, developing and applying health behaviour theories in interventions.

In the next section, one health behaviour theory, the Health Belief Model (HBM), will be presented and discussed in the context of complementary feeding.

2.4 The Health Belief Model

The Health Belief Model (HBM) was originally described already in the 1950’s by social psychologists trying to explain why people do not use health services, for example screening of diseases (70). Since then it has been used widely to explain different health behaviours, such as screening attendance, self-care behaviours and smoking cessation (12).

The four main constructs of the HBM are: perceived benefits and barriers related to a health behaviour and perceived susceptibility and seriousness of a given condition, the two latter which together form the “readiness to act” (71). In addition to these four constructs, the HBM presents a fifth concept, cues to action, as important drivers or triggers to health behaviour (71).

The creator of the HBM along with other researchers have proposed merging several behaviour theories together and adding the constructs of self-efficacy and health motivation to the original HBM (72). However, this adapted version of the HBM has rarely been in the focus of research (73). The five main constructs of the HBM are depicted in figure 2 below.
Rosenstock (71) does not specify exactly how the five core constructs of the HBM should be operationalized (74). However, he describes the five constructs in detail as follows (71):

The susceptibility construct represents the risk an individual perceives having for a certain health condition. For example, the risk an individual perceives of him or herself being malnourished. The susceptibility is not equal to the individual’s actual risk, as defined by clinical tests or procedures by professionals.

The seriousness is likewise a subjective perception an individual has for a given health condition. Both emotions and beliefs of the consequences of the condition influence the perceived seriousness. The beliefs of consequences may include far-reaching ones, like effects of the health condition on one’s economy or family. The severity and susceptibility together form the “readiness to act”.

The readiness to act does not alone determine the health behaviour or action to be taken, though if it is strong, it provides a steady motivation for the health behaviour. Perceived benefits of and barriers to a certain health behaviour may determine the course of action among several possibilities. Perceived benefits illustrate how effective, available or beneficial and individual thinks a health behaviour is. Perceived barriers, in contrast, illustrate the constraints, whether
physical, economical, or mental, an individual perceives there is when taking the health behaviour. Expensiveness, pain or social stigma are examples of these perceived barriers which create a motive for avoiding the health behaviour in question.

The readiness to act and perceived barriers and benefits together determine the likeliness of a health behaviour. In a case where the readiness to act is high and perceived barriers low, the health behaviour is more probable to be taken than in a situation where the readiness to act is low and the perceived barriers high. When the readiness to act and perceived barriers are of equal intensity, the course of action is not so evident. In this case, the fifth construct of the HBM may be critical.

Rosenstock (71) wrote already in 1966 that the fifth construct of the HBM, the cues to action, has not been subject to as careful examination as the other constructs. According to Carpenter (73), this is still the case. Rosenstock (71) defines the cues to action as “triggers” that lead the individual to the health behaviour in question. He also speculates that these cues to action are needed to set the health behaviour in process, even if the readiness to act have already provided the motivation and the perceived barriers and benefits determined the course of action.

The nature of these cues makes them difficult to study, since they may be seemingly insignificant events that individuals do not memorize, such as hearing of a treatment from a neighbour or seeing a poster related to the subject (71). In previous research, diverse behavioural interventions have been recognised as cues to action, such as text messages for diabetes prevention, behavioural recommendations in health news and simple messages in university restaurant trays to increase vegetable consumption. (75-77).

The cues to action may be categorized into external cues; such as media, education and interaction with other people, or internal; such as a perceived change in one’s bodily state (71). Rosenstock (71) explains further that the required strength of a cue depends on the level of readiness to act. For example, if someone barely perceives himself susceptible to malnutrition and does not perceive it severe, a relatively strong stimulus, such as clear symptoms of deficiency, are needed to trigger him to the health behaviour.

It is important to remember, that though the five constructs of the HBM are individual perceptions, they are all affected by social norms and interaction between each other (71).
Some reviews have examined the effectivity of the HBM to predict health behaviour as well as the impact of HBM in intervention design. In his meta-analysis, Carpenter (73) examined the predicting power of the five constructs in HBM separately. He concluded that the severity, barriers and benefits all had some predictive power of the health behaviour measured, severity being the weakest of these. Susceptibility was not associated with the behaviour outcomes. Cues to action were not considered in the review, since there were not enough studies that had measured the effect of cues to action. In the end, only perceived barriers and benefits remained as significant predictors of health behaviour (73). Mediation and moderation between the separate constructs of the HBM should be considered when evaluating the effectiveness of the HBM, reminds Carpenter (73).

The HBM has been used to design health behaviour change interventions. Sohl and Moyer (78) found interventions applying the HBM effective in mammography screening promotion. Jones et al. (74) conducted a review of studies evaluating the use of the HBM in designing health behaviour interventions concentrating on adherence behaviour. In contrary to Sohl and Moyer (78), Jones et al. (74) concluded that HBM was not related to the success of interventions. They repeated the common critique of the model, being that the creators of the HBM have not specified how the different constructs of the model should be operationalized (74). According to Jones et al. (74), this discrepancy blurs the effective use of the HBM.

Reports considering application of the HBM in qualitative studies are fewer than those from quantitative studies. The HBM has been used in qualitative designs for example in the context of seeking social support for eating disorders, perceptions of walking exercise for stroke prevention and designing an education program on sport injuries (79-81). The HBM was applied in various ways in these studies: as an analysis tool of the qualitative data (79), in the focus group study design (80) and in the interview study design (81).

The review of Carpenter summarizes how the HBM has been used in many studies concentrating on preventive health behaviour to certain diseases or conditions, such as tuberculosis, breast cancer or influenza (73). The HBM has also been applied in nutrition studies concerning, for example, menu labels in restaurants (82), food safety issues among college students (83) and adolescent folate-rich food intake and knowledge (84) However, the HBM has been rarely applied to infant care and feeding behaviours, which are the focus of this study. Yet, the use of behaviour
change theory in complementary feeding interventions has been emphasized by recent research (8,85,86).

A review on complementary feeding educational interventions called for the application of theory-based frameworks and models and presented a logic model based on the HBM as an example (13). In this model, the constructs of the HBM were defined as follows: Severity of and susceptibility to undernutrition and diarrhoea, perceived benefits of improved complementary feeding practices and perceived barriers to them. As to cues to action, nutrition support groups, text message services, leaflets, radio and TV jingles, nutrition demonstrations and practice sessions were mentioned as examples. The model was merely an example and was thus not applied into practice in the article.

No qualitative complementary feeding studies applying the HBM were found for this study. Only a handful of complementary feeding studies that applied the complete HBM were found at all. These articles mentioned the HBM as a principle for the formative research carried out before the main study (89) or as a background theory for a certain approach employed in the study (90). How the HBM was applied, was not explained in detail in these articles.

The only articles giving slightly more detail of how the HBM was applied in the complementary feeding context, were two Ethiopian interventions conducted by the same research group (91,92). These complementary feeding interventions focused on pulse use promotion in Ethiopia.

In their study design, Mulualem et al. (91) used a modified version of the HBM including also the construct of self-efficacy. The HBM was used in designing the nutrition education delivered to mothers in the intervention group. Mulualem et al. (91) reasoned that they employed the HBM in the nutrition education design to make it more relevant for the mothers, especially because strong beliefs were associated with not using pulses for complementary feeding. The researchers explained in detail how they operationalized the five core constructs of the HBM and the construct of self-efficacy to the nutrition education design. For example, one of the barriers they aimed to tackle with the education was the belief that complementary foods consisting of pulses would not be tasty and suitable for the child (91).

An almost similar controlled intervention study was conducted by the same research group in another province in Ethiopia (92). In this study, Tariku et al. (92) applied the HBM to design nutrition education for mothers.
The results of these two studies described above were parallel to each other. Tariku et al. (92) reported that diversity of complementary foods had increased in all study groups, but the difference was significant only in the HBM group. The researchers speculated that only the HBM based education approach was convincing enough to affect the dietary diversity, because it took into account the perceived barriers for increasing dietary diversity (92). Likewise, Mulualem et al. (91) found that participating mothers’ knowledge, attitudes and practices about pulse-based complementary foods enhanced only in the intervention group, which had received HBM based nutrition education.

There are other promising results for the use of the HBM in nutrition education studies in addition to these two complementary feeding studies. An intervention study on adolescent folate intake and knowledge found that the education intervention based on the HBM increased folate knowledge among adolescents (84). Another study found an HBM based educational approach effective in improving several outcomes among asymptomatic hyperuricemia patients (93). Closely related to complementary feeding, an HBM-designed breastfeeding educational intervention enhanced the self-efficacy, knowledge and attitudes of pregnant women (94).

Based on the two complementary feeding studies and other nutrition education studies presented above, the HBM seems a promising theory for complementary feeding promotion. Nevertheless, only a few complementary feeding studies have reported the application of the HBM, and none of them have applied the theory with qualitative methods. There is clearly a need to explore the utilization of the HBM in a qualitative complementary feeding study.

2.5 Theoretical framework of complementary feeding

Figure three below presents a framework of applying the HBM on complementary feeding. The benefits of good complementary feeding are related to meeting the nutritional requirements of infants. Barriers for good complementary feeding may be related to food insecurity, the poor status of women and lack of knowledge as well as adverse beliefs. The susceptibility may be observed in the caretakers’ worries for the child’s health and nutrition. The severity of poor complementary feeding and its consequences, undernutrition and stunting, may be poorly
understood in resource-poor settings. Cues to action for better complementary feeding may be categorized as internal and external cues.

**Figure 3**: Framework of complementary feeding based on the HBM
3 Aim of the study

Extensive research has shown that the period of complementary feeding is a critical window of opportunity to promote healthy growth and development of infants. Correspondingly, adequate complementary feeding is necessary to prevent stunting with its lifelong consequences. Still, the complementary feeding situation in Uganda is far from the recommended. Issues contributing to poor complementary feeding include among others food insecurity, the status of women and the lack of knowledge of proper infant feeding practices. Since complementary feeding is a complex set of behaviours driven by various determinants, diverse approaches are needed to address poor complementary feeding practices. Using behaviour change theories in health behaviour research is recommended by prior research. In this study, the HBM will be used as a theoretical background.

The aim of this study is to explore complementary feeding perceptions and practices in Kirewa, Uganda, in the context of the HBM and to gain understanding on how to promote health behaviour change for better complementary feeding.

The more specific research questions are:

1. What barriers do local caretakers perceive for good complementary feeding?
2. What are the benefits of good complementary feeding from the local point of view?
3. How do local caretakers perceive the severity of poor complementary feeding?
4. How do local caretakers perceive their children’s susceptibility to the negative consequences of poor complementary feeding?
5. What could work as cues to action for local caretakers for better complementary feeding?

In this study, caretakers refer to both parents, biological or other, grandparents and other adult people who primarily take care for the children.
4 Research location

4.1 Uganda

Uganda is a landlocked country situated in East-Africa. Uganda shares borders with Kenya, Tanzania, Ruanda, the Democratic Republic of Congo and South Sudan. Uganda has 121 administrative districts and one capital city, Kampala (95). The map below shows Uganda in relation to its neighbouring countries as well as the district of Tororo, where this study took place.

![Map showing Uganda's location](image)

**Figure 4.** Location of Tororo district (red) in Uganda. Map adapted from Wikipedia (96)

Uganda is classified as a low-income economy by the World Bank but ranks high in economic growth among African countries (97,98). Uganda has considerable natural resources including fertile land, adequate rainfall, oil reserves and some mineral reserves (95). The economy of Uganda is agriculture centred, as 72% of the workforce is employed in agriculture (95). The most important agricultural products in Uganda are coffee, tea, cotton, tobacco, sugar cane, cassava,
potatoes, corn, millet and pulses (95,99). Some illustrative statistical figures concerning Uganda are presented in table 2 below.

Table 2. Statistical figures of Ugandan population, economics, health and education (reference in parentheses)

<table>
<thead>
<tr>
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<th>2016 (100)</th>
<th>2014 (101)</th>
<th>2011 (102)</th>
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<tr>
<td><strong>Population (millions)</strong></td>
<td>41,49</td>
<td>83</td>
<td>70,3</td>
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<tr>
<td><strong>Area (thousand km²)</strong></td>
<td>241,6</td>
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<tr>
<td><strong>GNI (PPP, milliard international $)</strong></td>
<td>74,00</td>
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<tr>
<td><strong>GNI per capita (PPP, international $)</strong></td>
<td>1780</td>
<td></td>
<td></td>
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<tr>
<td><strong>Proportion of multidimensionally poor people (%)</strong></td>
<td>34,6</td>
<td>73,9</td>
<td>5,7</td>
</tr>
<tr>
<td><strong>Population living below income poverty line $1.90/day (%)</strong></td>
<td>59,2</td>
<td>54,6</td>
<td>29</td>
</tr>
<tr>
<td><strong>Adult literacy rate (%) from the age of 15</strong></td>
<td>57,9</td>
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<tr>
<td><strong>Mean years of schooling (for population aged ≥ 25 years)</strong></td>
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<tr>
<td><strong>Life expectancy at birth (years)</strong></td>
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<tr>
<td><strong>Under-five mortality rate (per 1,000 live births)</strong></td>
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<tr>
<td><strong>Under-five stunting rate (%)</strong></td>
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<tr>
<td><strong>Deaths due to malaria (per 100,000 people)</strong></td>
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GNI = Gross National Income
PPP = purchasing power parity rates
Multidimensional poverty includes poverty related to education, health and living standards.

Uganda ranks low in human development with its Human Development Index (HDI) value of 0,493 (2015) and ranking of 163rd out of 188 countries and territories (103). The HDI is based on figures assessing progress in healthy life, access to knowledge and standards of living (103). Thus, the low life expectancy, poor education measures and small GNI per capita explain the low HDI of Uganda (103). Yet, if inequality in the human development indices is taken into account, the HDI of Uganda drops to 0,341 (103). This means the human development in healthy life, access to knowledge and living standards is not equally distributed among urban and rural areas and people of different sex and ethnicities.

Uganda is an endemic malaria area and has one of the greatest malaria transmission rates globally (104). Malaria is the most often reported disease in Uganda and remains the principal reason for
morbidity and mortality. Therefore, malaria has a heavy effect on household and state economy in Uganda (104).

Another widespread health issue in Uganda is the HIV. The adult prevalence rate for HIV is 5.9% and the annual mortality is 28000 (2016), ranking tenth worst in the world (95). The heavy toll of diverse infectious diseases and childhood undernutrition in Uganda are significant health burdens as well (6,95). Nevertheless, the birth rate in Uganda is among the fifth highest in the world (95).

Despite a history of violence and civil unrest, Uganda has developed to a stable presidential republic (95). Though the current president has ruled the country since 1986, a multi-party system of governance was established in the country in 2005, suggesting at least some level of democracy (105). However, good governance is impeded by corruption, lack of transparency, and both a weak institutional government as well as a weak civil society capacity (105).

In relation to this study, it is interesting to note that only 5% of women and 10% of men in Uganda have a weekly access to mass media, such as radio or TV (6). Therefore, it may well be assumed that the videos used in this study are a completely new source of information for the study participants.

4.2 The study area

This study was conducted in the Kirewa subcounty of the Tororo district, in eastern Uganda. World Vision Finland and World Vision Uganda made the practical arrangements for the study and Kirewa was chosen as the study site because World Vision Finland had a regional development program in Kirewa. The location of Kirewa subcounty in Tororo district is presented in the map below (figure 5).
The following information about Kirewa subcounty is obtained from the World Vision Uganda Kirewa Assessment Project Report 2007 (107). Any other reports about the Kirewa subcounty were not available. The population of Kirewa subcounty was estimated at 34 254 in 2007. As in the national level, also in Kirewa the birth rate is high and family size is on average seven persons. This might be partly due to poor availability and acceptability of family planning services as well as weak gender mainstreaming.

Gender disparity in Kirewa is demonstrated in the higher workload of women, their lack of ownership of assets and unequal education and job opportunities for women. These disparities are rooted in cultural gender roles whereby women are regarded as the property of their husbands and have virtually no decision-making power.

All arable land in Kirewa subcounty is used for crop cultivation. Crop and livestock farming are both practiced mostly on a subsistence level. Major food crops in the area include cassava, millet, sorghum, maize, rice, groundnuts, beans and sweet potatoes. Some food crops as well as cotton are cultivated for resale.
Poverty is omnipresent in Kirewa subcounty, as 80% of Kirewa dwellers lived below the poverty line in 2007. Overcultivation of land which has led to decreased soil fertility is one factor behind poverty. Other factors constituting to poverty are the high population, weak gender mainstreaming, poor farming methods, unreliable weather, environmental degradation and illiteracy. Literacy rates in Kirewa subcounty are far below the national averages: 52% for females and 46% for males compared to the national averages of 68% and 79%, respectively.

Similar to the literacy rate, life expectancy at birth drags far behind the national average, being only 35 years in Kirewa subcounty. However, the stunting rate for under five-year olds is lower than the national average: 20% for boys and 15% for girls compared to the national average of 29%. Malaria remains the main cause of death for children and adults, followed closely by HIV among adults.
5 Methods and sample

Data for this study was collected in nine focus group discussions (FGD) and one in-depth interview (IDI). A qualitative approach was chosen in this study because the aim of exploring complementary feeding perceptions and practices could not be reached with quantitative methods. Qualitative research is generally described as flexible, descriptive, exploring rather than confirming, and yielding often textual data (108). Due to its flexibility, qualitative methods can reveal new insights unanticipated by the researcher, thus creating new hypotheses (108). Qualitative research methodology aims to discover the underlying meanings, associations and perceptions individuals have on certain issues (109). Therefore, qualitative research finds individuals’ definitions of phenomena equally important as set definitions (110).

5.1 Focus Group Discussions

FGDs were used for data collection in this study because they were appropriate for examining local caregivers’ perceptions and practices on complementary feeding. Focus group discussion (FGD) is a qualitative data collecting method resembling group interviews and is used in many research fields as well as popular marketing (108, 111). FGDs produce data from the participants’ interaction stimulated by the discussion questions that the moderator of the FGD poses (108,111). The discussion questions are designed in advance by the researcher to answer the research questions (111). In addition to the moderator and the participants, an FGD usually consist of a note-taker, who records the flow of the discussion. A tape-recorder is often used to record the FGD. (108)

During an FGD, the moderator asks open-ended questions to create discussion on the topic of interest and can use probes to encourage more discussion and to evoke versatile opinions (108). The role of the moderator depends on the research design and goals (111). The moderator of an FGD can guide the FGD in two aspects: by guiding the discussion topics and the discussion dynamics (111). If a moderator guides the FGD heavily in both aspects, in practice he/she limits the discussion strictly to the discussion questions presented and tries to ensure every participant is involved equally in the discussion. Morgan (111) defines these kinds of FGDs, were the moderator is heavily involved, as more structured.
There are, however, different opinions on the role of the moderator. Bloor (112) calls the moderator a facilitator and emphasizes that the facilitator should not control the group. He explains that substantial external control in an FGD might alter the original groups’ dynamics and influence even the data drawn from the FGD (112). Yet, Bloor (112) underlines that the facilitator should moderate group dynamics.

The level of moderator involvement in this study was intended to be minor but in practice the moderator had to ask more questions than designed and use many probes to encourage discussion. The moderator in the FGDs of this study did not interfere in group dynamics.

The FGD method has a number of attractive features. It is a cost-effective method, often resulting in a rich data in a relatively brief time (108). FGDs can bring insight to group or even cultural norms and meanings, produce a vast overview of the research issue in the cultural context, and reveal group opinions and the variety of opinions in a community (108, 112). FGDs are well suited for exploring complex behaviours and motivations on, as in the case of this study, complementary feeding (111).

One unique feature of FGDs is the interaction between participants (111). Interaction between participants can bring to discussion issues that would not arise in single interviews and can expose the roles of participants, even those they have outside the FGD, to the researcher. (108) The data yielding from an FGD is not simply a sum of interviews of all the participants. The participants’ interaction, for example querying, challenging and agreeing or disagreeing, might have a synergist effect to what is said in the discussion (111). This effect is sometimes called “the group effect” and is one major virtue of FGDs (111).

The challenges of the FGD as a research method are related to the group effect. The group setting has also negative aspects. It may restrict what issues can be discussed in the first place, as some topics may be too sensitive to be discussed in a group (111). The group dynamics may also prevent some participants from expressing their ideas if they conflict with group norms or if the participant is silenced by the social pressure of the group (113).

Due to the differences in group dynamics between different FGDs, several discussions are required on the same study subject to achieve a wider view of the topic, let alone theoretical saturation (114). Moreover, the behaviour of the moderator increases the diversity of FGDs. The moderator plays a critical role in the success of the FGD; whether everyone in the group participate, whether
all topics are discussed, and interesting points are followed further (114). Also, the moderator might change the FGD into a group interview with excessive control (111). The idea of an FGD is to mimic a natural discussion, but can it ever be possible with a moderator present? In addition, one major challenge in FGDs is the data produced: the analysis of lengthy and elaborated FGD data with several different speakers and a random order of the topics is burdensome (113,114).

Despite the challenges of the FGD method, they were used for data collection in this study because the aim was specifically to examine local caregivers’ perceptions and practices on complementary feeding. FGDs enable, to some extent, the collection of norms and practices at the community level. Therefore, FGDs were found the best method to explore how the HBM can be applied into the local complementary feeding context: what are the perceived barriers, benefits, severity, susceptibility and cues to action from the local caretakers’ point of view.

5.2 Individual interviews

FGDs are often used together with other qualitative methods, such as individual interviews (IDI), to produce more versatile data (112). One IDI was held in this study in order to get insight into some of the issues that arose in the FGDs. IDI is an appropriate research method even if the study subject is intimate and possibly uncomfortable to discuss in a group setting (108,112). FGDs often lead to a group consensus and striving for that might silence some contradictory opinions (112). Therefore, IDIs may evoke further opinions than FGDs, especially on sensitive issues.

IDIs consist only of the interviewee and the interviewer, who poses open-ended questions, follow-up questions and probes, depending on the research design (108). As the term individual interview suggests, IDIs are ideal for accumulating individual opinions, perspectives, experiences and feelings (108).

IDIs can be classified based on how structured they are: how restrictive the interview questions are, whether they are the same for all interviewees and how strongly the interviewer directs the flow of the interview (115). In a structured interview the questions are the same for all interviewees, they should all be covered, and they include answering options (115). In a semi structured interview, the questions are the same for all interviewees, but there are no answering options (115). On the other hand, open-ended or unstructured interviews have open-ended
questions where the interviewee can answer freely (116). Eskola and Suoranta (115) parallel open-ended interviews to a discussion, which is only slightly guided by the interviewer. In addition to these interview categories, Eskola and Suoranta (115) describe thematic interviews as a type of interview, where no questions are planned in advance, but the interviewer has designed certain discussion topics to be covered. The interview conducted in this study was closest to an open-ended interview.

The interpreter of all the FGDs, who also worked as a health worker in Kirewa, was interviewed in the IDI of this study. It was valuable to obtain his view as a health worker on the complementary feeding issues in Kirewa. The health worker’s understanding on complementary feeding and maternal and child nutrition questions was elicited by the interviewer. In addition, the interview provided more detailed information on the recruitment of the FGD participants.

5.3 Sampling

Qualitative research does not aim to have statistical significance (117). Therefore, the sample size of qualitative studies is not based on statistical measures (117). Nine focus group discussions were held in this study. The number of participants per discussion ranged from five to fourteen. Altogether, there were 68 participants in the FGDs and one individual interview. The number of FGDs was decided to nine due to time constraints and the aim to have at least one group of each caretaker (mothers, fathers, grandmothers and grandfathers).

Purposeful sampling was used to select the participants. The interpreter of the research recruited participants for the FGDs, since he best knew the study area and its inhabitants. The whole Kirewa subcounty was represented in the sample as the participants were invited from each of the subcounty’s five parishes. Only one person from each household was recruited to the FGD. The goal was to have six to eight participants in each FGD, but in practice the size of FGDs was more varied.

A focus group can consist of strangers or people, who already know each other and actually have a social group outside the discussion, such as a group of friends, colleagues or neighbours (112). The focus groups in this study were not pre-existing groups, though some of the participants knew each other in advance, since they were from the same village and thus used the same health services.
The original plan was to have eight FGDs: four FGDs of mothers (including two pilot groups), two of fathers, one of grandfathers and one of grandmothers. In addition to these groups, a ninth focus group with mixed participants was also held. The mixed group consisted of mothers, fathers, grandmothers and grandfathers from separate families. Two pilot FGDs with mothers were held and included in the analysis.

Separate FGDs consisting of mothers, fathers and grandparents were held to grasp the different caretakers’ perceptions on complementary feeding. Due to local cultural roles of caretakers, it was found important to have different caretakers presented in the data. In addition, the dynamics between different caretakers could be captured in the mixed focus group.

As to why grandparents were involved in the FGDs, was their role in the community as advisors and thought leaders. Grandmothers have been discussed to have a major role in childcare as advisors, caretakers and influencers (118,119). However, grandmothers’ perceptions of infant feeding are generally not in line with the current, biomedically based recommendations (119). Therefore, there is a need to involve grandmothers and elders in nutrition education, especially as they have not been given much attention in previous research (118).

5.4 Field work

The field work of the research took place in Kirewa, Uganda in July 2017. The study site was described in the chapter “Study Area”. Altogether nine focus group discussions were held in five days (7th July and 11th-14th July), two per day, one in the morning and one in the afternoon. The research team consisted of the master's student, who was the moderator of the FGDs, her supervisor (only 7th July), who took notes in the first two FGDs, a local note-taker for the rest of the FGDs and the above-mentioned interpreter.

The interpreter worked simultaneously, translating participants’ speeches from Japhadola to English and the moderator’s questions from English to Japhadola. This simultaneous interpreting enabled the moderator to ask follow-up questions related to what the participants said in Japhadola.

The practical arrangements for the FGDs were carried out by World Vision Uganda and the interpreter. World Vision Uganda’s Kirewa program office was used as the study facility for the
FGDs. The first two FGDs with mothers were piloting FGDs and the second one of them was held in the Kirewa health centre instead of the program office. All the remaining FGDs took place in the World Vision Kirewa program office, since the health centre was found noisy and prone to interruptions.

5.5 Data collection

The data for this study was collected in nine focus group discussions and one individual interview. In addition, background questionnaires were collected from each participant. All the FGDs and the interview were digitally recorded.

A background questionnaire was designed to describe the study sample. In addition to questions on the socioeconomic background, some more personal questions related to complementary feeding were asked in the background form because intimate questions are better asked in a personal form than in an FGD. Background forms were slightly different for the different caretakers and are found in the appendix.

Before each discussion started, the researcher presented herself and the whole research as well as reminded of the FGD principles, which were also expressed in the consent form obtained from the participants. The FGD participants were asked to introduce themselves prior to the discussion questions. Some introductory questions related to parenting served as warming up questions in the beginning of the FGD.

Focus group discussion methodology guides recommend using projective tools as focusing exercises and to encourage discussion (120). The GloCal videos were used as a projective tool in the FGDs of this research. During the FGDs, the GloCal videos served as an introduction to new subjects and discussion questions. Feedback on the videos was also collected from the participants.

The focus of this study was complementary feeding, which is why the GloCal videos shown were related to complementary feeding. The videos shown in the FGDs are presented in table 3 below along with the information, which caretakers saw the videos.
Table 3. Videos shown in different FGDs. The capital letters M, F etc. indicate which group of caretakers saw the video: M=mothers, F=fathers, GF=Grandfathers, GM=grandmothers, MX=mixed FGD

<table>
<thead>
<tr>
<th>Name of the video</th>
<th>FGD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Starting Complementary Feeding at 6 Months</td>
<td>M, F, GF, GM</td>
</tr>
<tr>
<td>Complementary Feeding at 9-11 Months</td>
<td>M</td>
</tr>
<tr>
<td>Enriching Porridge</td>
<td>M, GM</td>
</tr>
<tr>
<td>Minimum Dietary Diversity</td>
<td>M, F, GF, MX</td>
</tr>
<tr>
<td>Complementary Foods from Family Foods</td>
<td>M, F</td>
</tr>
<tr>
<td>Cognitive Development</td>
<td>M, F</td>
</tr>
<tr>
<td>What about Dad</td>
<td>M, F, MX</td>
</tr>
<tr>
<td>HIV and Breastfeeding</td>
<td>M</td>
</tr>
<tr>
<td>Exclusive Breastfeeding</td>
<td>MX</td>
</tr>
</tbody>
</table>

These videos presented in table 3 were chosen because they depicted the critical points in complementary feeding, the starting age and dietary diversity, and presented complementary feeding practices, such as enriching porridge. The What about dad -video was included to evoke discussion on caretakers’ roles in childcare.

The choice of the exact video was determined by the moderator depending on the discussion topics and dynamics of each group and was not set beforehand. Because discussions were different in each group, they were not all shown the same videos. Each video lasted about two to four minutes.

The individual interview with the health worker was conducted one week after the FGDs. An interview guide was created based on the themes that emerged in the FGDs. Videos were not shown during the interview. The interview guide included questions on the interviewee’s own opinions on complementary feeding, both regarding the recommended practices and the local practices as well as the local complementary feeding situation with its determinants and questions on the interviewee’s work as a health worker.
The HBM was used as the theoretical framework in this study. Based on former research in Uganda, the HBM was found ideal for taking into account the diverse determinants and barriers as well as beliefs and perceptions related to complementary feeding. The HBM is often used in studies, where the health condition does not give any clear symptoms, like in the case of poor complementary feeding outcomes. (12). Also, though the HBM is widely used in the field of health behaviour research, it has been applied into complementary feeding behaviour in only a few studies (91,92). Thus, applying the HBM to this qualitative complementary feeding study was found relevant.

The FGD discussion guide was based on the HBM, as the aim was to elicit the five constructs of the HBM in relation to complementary feeding. The FGD discussion guide dealt the topics presented in table 4 below.

**Table 4. FGD discussion themes.**

<table>
<thead>
<tr>
<th>Perceptions of good first foods to start complementary feeding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local complementary feeding practices</td>
</tr>
<tr>
<td>Perceived benefits of good complementary feeding</td>
</tr>
<tr>
<td>Perceived barriers to good complementary feeding</td>
</tr>
<tr>
<td>Cues to action for complementary feeding</td>
</tr>
<tr>
<td>Perceptions of balanced diet</td>
</tr>
<tr>
<td>Perceived benefits and barriers for providing a balanced diet with complementary foods</td>
</tr>
<tr>
<td>Perceived susceptibility and severity of infant undernutrition</td>
</tr>
</tbody>
</table>

The full FGD discussion guide can be found in the appendix. In all FGDs, many additional questions and probes were needed to encourage discussion. These additional questions especially gave insight to the HBM constructs. Discussion questions were also raised after watching each GloCal video.
5.6 Data transcription and analysis

The data was transcribed by Aliisa Hyvönen verbatim from an audio file to Word format with the help of the Audacity software. The participants were coded with numbers to ensure their anonymity. Qualitative analysis was used in order to gain insights into caregivers’ perceptions and practices. The content analysis was deductive, based on the Health Belief Model.

Five thematic categories were created from the HBM’s core constructs and guided the analysis: perceived barriers, perceived benefits, perceived susceptibility, perceived severity and cues to action. These five thematic categories were divided into three classes according to the various aspects of good complementary feeding: providing an appropriate complementary feeding diet, starting complementary feeding timely and breastfeeding up to two years.

Themes that emerged outside the HBM were categorized in an inductive manner. The themes that emerged from the data were complementary feeding perceptions and practices, breastfeeding perceptions and practices, social relations, solutions and the category “other”. The analysis of the mothers’ FGDs was used as a scheme for subsequent analysis: sub classes and inductive themes that emerged from the mothers’ data was applied to the analysis of following FGDs as well.

All themes were ordered into categories and subsequent sub-categories using Microsoft Office Excel 2016. Table 5 below gives an example of the categorization of the data.

<table>
<thead>
<tr>
<th>Original</th>
<th>Simplified expression</th>
<th>Sub class</th>
<th>Class</th>
<th>Theme</th>
</tr>
</thead>
<tbody>
<tr>
<td>Because some people cannot afford all the...[foods in balanced diet] 1</td>
<td>Some cannot afford all the foods</td>
<td>Poverty</td>
<td>Barriers to providing an appropriate CF diet</td>
<td>Perceived Barriers</td>
</tr>
<tr>
<td>Lack of money. 1</td>
<td>Lack of money</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poverty. 1</td>
<td>Poverty</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
5.7 The study sample

Characteristics of the mothers, fathers, grandfathers and grandmothers who participated in the FGDs are presented in table 4 below.

**Table 4. Characteristics of study participants**

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Mothers</th>
<th>Fathers</th>
<th>Grandfathers</th>
<th>Grandmothers</th>
<th>Mixed$^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>N</strong></td>
<td>31 / 45%</td>
<td>13 / 19%</td>
<td>7 / 10%</td>
<td>6 / 9%</td>
<td>11 / 16%</td>
</tr>
<tr>
<td><strong>Age group$^1$</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19-29</td>
<td>7 / 23%</td>
<td>3 / 23%</td>
<td></td>
<td>1 / 9%</td>
<td></td>
</tr>
<tr>
<td>30-39</td>
<td>3 / 10%</td>
<td>4 / 31%</td>
<td>1 / 17%</td>
<td>4 / 36%</td>
<td></td>
</tr>
<tr>
<td>40-49</td>
<td>1 / 3%</td>
<td>4 / 31%</td>
<td>1 / 14%</td>
<td>5 / 83%</td>
<td>3 / 27%</td>
</tr>
<tr>
<td>50-59</td>
<td>2 / 15%</td>
<td>2 / 29%</td>
<td></td>
<td>1 / 9%</td>
<td></td>
</tr>
<tr>
<td>≥ 60</td>
<td></td>
<td>4 / 57%</td>
<td></td>
<td>1 / 9%</td>
<td></td>
</tr>
<tr>
<td><strong>Education level$^3$</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>3 / 23%</td>
<td>2 / 33%</td>
<td></td>
<td>4 / 36%</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>14 / 45%</td>
<td>4 / 31%</td>
<td>4 / 57%</td>
<td>1 / 17%</td>
<td>3 / 27%</td>
</tr>
<tr>
<td>C</td>
<td>16 / 52%</td>
<td>5 / 38%</td>
<td>3 / 50%</td>
<td>4 / 36%</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>1 / 8%</td>
<td>2 / 29%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>1 / 3%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Child count$^4$</strong></td>
<td>4.5 ± 2.6 (1,11)</td>
<td>5.8 ± 3.5 (1,12)</td>
<td>8.3 ± 3.1 (4,13)</td>
<td>6.2 ± 2.5 (1,8)</td>
<td>5.3 ± 2.4 (2,9)</td>
</tr>
<tr>
<td><strong>Household size$^4$</strong></td>
<td>6.2 ± 2.4 (3,13)</td>
<td>8.8 ± 3.9 (3,16)</td>
<td>3.9 ± 1.5 (2,6)</td>
<td>9 ± 2.5 (4,12)</td>
<td>8 ± 2.9 (3,13)</td>
</tr>
</tbody>
</table>

1: Mothers: Age not asked in two first discussions (FGDs 1 and 2)
2: Female 6 (55%) / Male 5 (45%) in the mixed group
3: A) less than primary school B) primary school C) lower secondary school D) higher secondary school E) higher than high school
4: Mean, ± standard deviation and (range)

Out of the total nine FGDs (n=68), four FGDs were mothers’ groups consisting of 31 mothers all together. Two FGDs were held for fathers, with 13 participants. Grandfathers and grandmothers had one FGD each with seven and six participants, respectively. The mixed FGD included mothers, fathers and grandparents and was the biggest of the groups with its 11 participants. There was an almost equal participation from both sexes in the mixed FGD.

The age-class distribution varied as expected among the five participant groups. Almost all mothers were below 40 years old and at least fifth of them below 30. On average, fathers were older than mothers, but also some young fathers (below 30 years) participated in the study. Grandfathers were older than grandmothers, most of them above 60 years, whereas the majority
of grandmothers in the study were between 40 and 50 years. Participants in the mixed group were mainly 30-50 years old, only some individuals being younger or older than that.

Participants’ education level varied widely within and across the groups. Most participants had primary school or lower secondary school education. A significant percentage of participants in the fathers’, grandmothers’ and mixed groups had less than primary school education. Only a few participants had more education than lower secondary school. Illiteracy was not asked in the study but based on the background forms some of the participants were illiterate.

Average child count was somewhat lower within the mothers’ and the mixed groups than with the fathers and grandparents FGDs. Only a few participants had less than two children and most families had children spaced by every two years. Small children were present during the mothers’ and the mixed FGDs.

5.8 Ethical considerations

The topic of the research was ethical, highlighted by the fact that part of the study team was local, and the resulting data was shared between the partners. In addition, the educational videos used during the research were left for the use of locals for their benefit.

All the data collected in the project was anonymized for the analyses. Individual subjects cannot be identified in this report. Ethical permission for the study was applied and granted from the School of Health Sciences Institutional Review Board and Ethics Committee, Makerere University College of Health Sciences (Uganda). The Ethical permission can be found in the appendix.

All the people who were willing to participate in FGDs were informed carefully about their rights and their signed informed consents were obtained. Participants were informed that their refusal to participate at any time had no consequences for them. The participants’ names would not appear anywhere nor would their identities in anyway be disclosed to anyone.

All data collected was coded and stored anonymously and analysed by the author only. The original and digital data was stored at the University of Helsinki.
6 Results

In this section, the complementary feeding practices and perceptions in the Kirewa area are described. Following this, the results of the deductive content analysis based on the HBM are presented. Lastly, some family factors related to infant feeding practices among the study participants are described.

6.1 Complementary feeding practices

Figures describing breast- and complementary feeding practices among the study participants are presented in table 6 below.

Table 6. Breast- and complementary feeding figures based on the background forms

<table>
<thead>
<tr>
<th>Breastfeeding</th>
<th>31 / 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breastfeeding duration (months)</td>
<td></td>
</tr>
<tr>
<td>6-7</td>
<td>3 (9%)</td>
</tr>
<tr>
<td>12</td>
<td>5 (15%)</td>
</tr>
<tr>
<td>18</td>
<td>5 (15%)</td>
</tr>
<tr>
<td>24</td>
<td>19 (56%)</td>
</tr>
<tr>
<td>&gt; 30</td>
<td>2 (6%)</td>
</tr>
<tr>
<td>Complementary feeding starting age (months)</td>
<td>5.14 ± 1.71 (0.25; 7)</td>
</tr>
<tr>
<td>Challenges when starting CF yes / no</td>
<td>12 / 9</td>
</tr>
</tbody>
</table>

1: All mothers and 4 fathers (from the mixed FGD)
2: No data for 5 mothers N = 37
3: No data for 7 participants N = 34
4: Complementary feeding starting age and challenges not assessed in the mixed group. Data only from mothers, except no data for two mothers. N = 29
5: Mean, ± standard deviation and (range)
6: No data for 10 mothers, N = 21

Breastfeeding was the most common feeding practice of infants less than six months among the study participants. As table 6 above illustrates, out of all the participants who had given a response to the dichotomic question “did you breastfeed your last child” only one had replied negatively. Duration of breastfeeding varied widely. More than half of the respondents reported breastfeeding for two years. Two participants had breastfed for longer than two years, while only one had breastfed for less than six months.
Continued breastfeeding after starting complementary foods was challenging for some mothers due to the lack of breast milk. Still, other mothers said they could breastfeed even longer than two years and that the challenge is starting complementary feeding.

According to the background data, most mothers introduced their children to complementary foods at six months. Only seven mothers reported starting complementary foods before six months. Starting complementary feeding too late was not a concern among these mothers, as solely one mother reported starting at seven months. Nevertheless, the fathers told in their FGD, that some mothers start later than at six months, even not until one year, because they have nothing to give.

A considerable proportion of the study mothers had experienced some challenges when starting complementary feeding. One mother had such challenges with the baby refusing that she had not even started complementary feeding at one year. Yet, those who met no challenges were still the majority. The challenges were categorised into three main categories: refusing, adverse effects and difficulties during feeding which will be discussed further in the section about perceived barriers to complementary feeding.

Table 7 provides details on what kind of complementary foods were given to infants by the caretakers in this study and what foods were perceived as good first foods to give. First foods signify the foods which are consumed to start complementary feeding. First foods mentioned in the background forms (only mothers) and the FGDs were largely similar, but there were two interesting foods mentioned in the background forms that were absent in the FGDs. These were sugar water, which had been provided to the baby at the age of one week, and the tinned prepared “Cerelac”, a commercial complementary food preparation brand by Nestlé.

Another interesting comparison presented in table 7 is between the first foods reported commonly given and the first foods perceived as good to start complementary feeding with. The foods which were perceived good include more animal products (eggs and fish) and fruits in comparison to the foods actually given. Also, beans were mentioned as good first foods, but were not reported as foods given to infants when starting complementary feeding. On the other hand, tea and sugar water were mentioned as first foods given, but not mentioned as good foods, nor were other drinks, except milk. Porridge was a predominant first food and was mentioned
repeatedly in background forms and FGDs both as a food that is given and as a food perceived good to give.

Table 7. Common first foods to start CF with, perception of good first foods and foods commonly given to children under two.

<table>
<thead>
<tr>
<th>First foods</th>
<th>Foods perceived as good first foods</th>
<th>Foods given to under two-year olds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Porridge</td>
<td>Porridge (M,F,GM)</td>
<td>Porridge (millet, maize, mixed, soya, with milk) (M,F,MX)</td>
</tr>
<tr>
<td>Porridge mixed with katogo (=mix of banana and pea nuts)</td>
<td>Enriched porridge (M,F)</td>
<td>Enriched porridge (milk, soya, fish) (GF)</td>
</tr>
<tr>
<td>Cow milk</td>
<td>Mixed porridge (F)</td>
<td>Potato (M,F,GF)</td>
</tr>
<tr>
<td>Matooke (plantain)</td>
<td>Potatoes (MX)</td>
<td>Sweet potatoes (M)</td>
</tr>
<tr>
<td>Banana</td>
<td>Rice (F,MX)</td>
<td>Matooke (M,F,GF)</td>
</tr>
<tr>
<td>Sugar water at 1 week</td>
<td>Matooke (F)</td>
<td>Rice (M,F)</td>
</tr>
<tr>
<td>Tea</td>
<td>Millet (F)</td>
<td>Millet bread (M,F,GF,GM)</td>
</tr>
<tr>
<td>Tinned prepared (Cerelac)</td>
<td>Soft foods like potatoes and matooke (GM,MX)</td>
<td>Milk (cow’s) (M,G,M,F)</td>
</tr>
<tr>
<td>Soft foods (M)</td>
<td>Eggs (F)</td>
<td>Dried fish (GM,</td>
</tr>
<tr>
<td>Rice (M)</td>
<td>Dried fish¹ (F)</td>
<td>Fruit (M,GF)</td>
</tr>
<tr>
<td>Milk (M)</td>
<td>Beans (GM)</td>
<td>Papaya (M)</td>
</tr>
<tr>
<td>Family food (F)</td>
<td>Fruits (F)</td>
<td>Oranges (M)</td>
</tr>
</tbody>
</table>

Data from all FGDs and mothers’ background questionnaires (italic)
1: "Omena” = dried, small “silver fish”
M=mothers, F=fathers, GF=Grandfathers, GM=grandmothers, MX=mixed FGD

As the findings above indicate, there are several issues to improve in complementary feeding practices in Kirewa, especially concerning the appropriate timing and quality of complementary foods. Nevertheless, the infant feeding situation is not as inadequate as it used to be a generation or few ago. In their FGDs, the grandparents were asked if infant feeding practices have changed from when they had small children themselves. The grandparents reported positive changes. Formerly children were fed cold leftovers, too spicy food, bread even before six months and
feeding was not correctly timed. Some grandparents expressed that poor feeding practices have changed thanks to sensitization.

6.2 Complementary feeding perceptions

6.2.1 Reasons to give mentioned foods to under two-year olds
As the list of the foods given to under two-year olds suggests, there is a variety of complementary foods available in the study area. Reasons to give these foods were asked in the FGDs. The reasons revealed constraints in food supply as well as perceived effects on child’s health and reasons related to child’s development. The reasons to give the foods mentioned in table 7 above are presented in figure 6 below.

As figure 6 illustrates, constraints in the food supply included factors such as availability, seasons, poverty and that those are locally available foods. Poverty was mentioned in several topics during the FGDs as well as the background forms.

Perceived effects on child’s health were mentioned as reasons to give the foods presented above. The complementary foods mentioned were perceived having positive effects on health: giving energy, having nutrients that boost growth and nutrients that are similar to breast milk. One caretaker told giving only milk to the infant, because other foods caused adverse effects, such as diarrhea and constipation.

Immediate feedback from the child was also a reason to give the foods, though not categorically a health effect. However, having this reason indicates that the caretaker reacted to the child’s response while feeding, that is, practiced responsive feeding. Yet, several caregivers reported using force when the child refused to eat.
Issues related to the child’s development were mentioned as reasons, especially for giving only soft foods. Soft foods were given because the intestines are not yet fully developed, the throat is not used to hard foods and the baby cannot yet chew, hence soft foods are easier to eat, and soft foods enable easier defecation. Mentioning these reasons suggests that the caretakers adapted the foods according to the physical development of the infant.

The caretakers’ view of good complementary foods described above gives an insight to the local situation. Moreover, the interview of the health worker in Kirewa provided another view to the same subject. The health worker described same local foods as good complementary foods, as mentioned by the caretakers: sweet potatoes, millet and maize porridge mixed with soya, dried fish and peanuts. However, the health worker pointed out that though a mixed porridge of maize/millet, soya, dried fish and peanuts would be nutritionally rich, most of the nutritious ingredients (soya, peanuts and dried fish) for it need to be bought. In reality, mothers do not have the money to buy these ingredients and majorly give porridge containing only millet flour.
In addition to describing the foods given to infants, the participants were asked if they provide a balanced diet to small children. Caretakers’ discussion on this question was contradictory. Many caretakers assured at first that they do give a balance diet to infants, but further in the discussion it appeared, that only those who could afford to provide all the food groups, gave a balanced diet. Yet, the common opinion was, that it is possible to give a balanced diet to children. According to the participants, all the food groups mentioned in the minimum dietary diversity -video were available in the community, but people were not familiar with the importance of mixing them and using them together. Another new aspect taught by the videos was, how some food groups can be substituted with others, which the fathers found relieving. All in all, caretakers seemed to understand the need for a balanced diet.

6.2.2 Perception of dietary diversity

As demonstrated above, dietary diversity of complementary feeding is something to improve among the study participants. Therefore, it is important to understand how local caretakers perceived dietary diversity. Participants in the FGDs often referred to the term balanced diet when discussing dietary diversity. How the participants defined the term balanced diet is illustrated in table 8 below. Grandmothers did not discuss the topic of balanced diet, which is why they are not included in the table.

<table>
<thead>
<tr>
<th>Mothers</th>
<th>Fathers</th>
<th>Grandfathers</th>
<th>Mixed</th>
</tr>
</thead>
<tbody>
<tr>
<td>All food groups</td>
<td>It's the classification</td>
<td>Giving different types of foods which give different nutrients for wellbeing</td>
<td>Different foods in a same meal and different kind of meal during one day.</td>
</tr>
<tr>
<td>All nutrients</td>
<td>Giving various foods to the baby</td>
<td>Foods needed for healthy growth</td>
<td></td>
</tr>
<tr>
<td>Balanced diet = fruits?</td>
<td>A meal which contains different food values: protein, vitamin, carbohydrate, calcium</td>
<td>Foods which change children's thinking capacity and attitude, to start to think about the right things.</td>
<td></td>
</tr>
<tr>
<td>Changing foods</td>
<td>Different foods with different values</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Different nutrients</td>
<td></td>
<td>Foods which remove some diseases</td>
<td></td>
</tr>
<tr>
<td>Different foods together</td>
<td></td>
<td>Eating different types of foods</td>
<td></td>
</tr>
</tbody>
</table>

Table 8. Definition of balanced diet by different caretakers. The only complete definitions are shaded.
All in all, the term balanced diet, which was locally used to indicate dietary diversity, was fairly well understood. Nevertheless, only one definition in the fathers’ group and the only definition given in the mixed group (shaded in table 8 above) met the comprehensive definition of a balanced diet indicating a diet, were different foods from several food groups are combined in one meal.

Changing foods or meals was perceived as the central idea of a balanced diet, but the importance of having different foods in the same meal was not generally pronounced. Yet, the need for a balanced diet can be distinguished from the mothers’ and grandfathers’ definitions above: to have all the nutrients, which the grandfathers in turn associated with healthy growth and improved thinking capacity of the children.

The Kirewan health worker likewise brought up in his interview that the community members did not know the correct definition for a balanced diet. He pointed out that though the caretakers understood the idea of having different foods and a change of meals over time, they seemed not to have assimilated the importance of having different food groups in one meal.

The Kirewan caretakers presented recognized the need for a balanced diet. Mothers described that a balanced diet is important and good for babies in order to give them energy and to grow well. Participants in the mixed group stated that it is even better for children to have a balanced diet and in larger amounts than adults, because it makes them grow well.

6.2.3 Perception of starting complementary feeding
When discussing, what would be a good age to start complementary feeding, most participants thought six months is a good age. Nevertheless, in the fathers’, grandfathers’ and mixed FGDs there were some differing opinions on the starting age.

One father thought that complementary foods can be introduced to the infant at three months, if the mother lacks breast milk. Another father expressed that “real food”, except drinks and porridge should only be started at one year. He did not indicate the starting age for porridge and drinks. One grandfather claimed that the correct starting age for complementary feeding can be judged from the infant’s behaviour after breastfeeding, irrespective from the age of the baby.
Some participants in the fathers’ and mixed FGDs said five months would be a good age to introduce complementary feeds.

Traditional herbs are common in Kirewa, and many caretakers in the mixed FGD agreed giving them to the child even before six months. Caretakers reported giving traditional medicines for stomach ache and to increase the baby’s appetite for breast milk, irrespective of the child’s age. The health worker perceived traditional medicines as a major issue impeding exclusive breastfeeding. According to him, traditional herbs are given to toddlers rather than medicines, because mothers find them effective.

Drinks were not perceived as food by local caretakers and could be started earlier than at six months. The grandmothers unanimously thought it is beneficial to give infants other drinks in addition to breast milk before six months. Giving other drinks before six months was supported by the infant’s need to regulate the temperature and water content of the body. Water was also thought to have no effect on the child, which was why it was given even straight after birth. Other drinks were also thought to add immunity and prevent excess sleepiness. Giving other drinks than breast milk before six months was even associated with good feeding and better school performance later in life.

The caretakers gave mostly physiological reasons for their perception of a good age to start complementary feeding. These reasons included development of the enzymes and the digestive system as well as the ability to chew and turn food in the mouth. The physiological reasons given demonstrated some level of physiological understanding. In addition, mothers, fathers and grandfathers stated that by six months the breast milk production has decreased, hence they must start complementary feeding. The caretakers also thought the baby has grown by six months and needs more food in addition to breast milk. One mother perceived starting complementary feeding at six months as an insurance for potential future misfortune; the baby has better chances to survive even without the mother, if she has received complementary feeds from six months.

In addition to the starting age for complementary feeding, the caretakers were also asked about introducing new foods to the baby. Mothers thought an adequate frequency for introducing would be at least one new food per week. Fathers and grandfathers described why new foods should be introduced regularly as follows: different foods give different nutrients for good and rapid growth
also for the brain and for the baby to become stress-free, different foods give the nutrients of a balanced diet and by giving different types of foods the baby learns to eat them.

The mixed focus group provided an overall definition for good feeding. According to them, good feeding includes a variety of foods that are timely fed. Timely feeding was explained as portioning the food to several meals per day thus not letting the baby to starve.

6.3 Health Belief Model based analysis of the complementary feeding data

In the next section the constructs of the Health Belief Model are used to analyse the background and FGD data. The HBM was described in detail in the Literature review (from page 22).

6.3.1 Perceived Barriers to good complementary feeding

The perceived barriers to good complementary feeding are presented in figure 7 below. Perceived barriers were mentioned in all FGDs. The barriers were categorized based on the different aspects of complementary feeding: appropriate diet, timely starting, continued breastfeeding and challenges when starting as well as overall barriers.
Figure 7. Perceived barriers to good complementary feeding. The capital letters M, F etc. indicate which group of caretakers mentioned the barrier. M=mother, F=father, GF=Grandfather, GM=grandmother, MX=mixed FGD, HW=health worker’s interview. CF = complementary feeding, BF = breastfeeding.

**Barriers to provide an appropriate complementary feeding diet**

Barriers to provide an appropriate complementary feeding diet were mentioned by mothers, fathers, grandmothers and the health worker. Several barriers were related to the lack of resources needed for food provision: poverty, lack of arable land and lack of food.
Poverty was a predominant perceived barrier in the mothers’ and fathers’ FGDs. Yet, how poverty affected complementary feeding was not well demonstrated in the FGDs. One association of poverty to poor complementary feeding was explained by the fathers, as they told that it is impossible for some to buy the seeds and seedlings needed to cultivate diverse crops.

Though poverty in the Kirewa subcounty is tangible, the health worker disagreed that it would be the main reason for not providing an appropriate complementary feeding diet. He told parents often perceive it as the main or only barrier, though the ingredients for an appropriate diet could be accessible:

“And basically, when you try to explain this to the parents some of the points they always bring in is poverty. Well, which I sometimes don’t agree up to because to me, -- I see the feeds there, the foods are there.” (Health worker interview)

Lack of food is naturally intertwined with poverty but in the Kirewan community, which relies heavily on subsistence farming, lack of food is likewise due to poor yields and to the lack of arable land. The health worker associated inadequate arable land to large families, because the arable land is insufficient compared to the size of the family.

Another factor hindering the subsistence farming are the unstable weather conditions, also mentioned as a barrier to providing an adequate diet. Even normal seasonal changes, with the regular dry season, impair the dietary diversity, let alone extensive draughts experienced in the Kirewa area during recent years.

The caretakers perceived issues related to attitudes, knowledge and behaviour as barriers to provide an appropriate complementary feeding diet for infants. Lack of knowledge was demonstrated as giving incorrect statements about foods and nutrients, not knowing how to mix food groups, how to prepare fish for infants and how to enrich porridge. The health worker stated parents lack knowledge about proper feeding and misunderstand the concept of balanced diet.

Cultural beliefs, myths and taboos were perceived as barriers by mothers and fathers but above all by the health worker. The health worker perceived the myths and taboos related to food as the greatest barriers to adequate complementary feeding:
“So some of these things [taboos] are still affecting us when it comes to child feeding. And sincerely, if there was anything we could do, is we should have first fought off these taboos and the beliefs that we have --” (Heath worker interview)

The health worker elaborated that most taboos restrict particularly children’s dietary diversity. He also suggested, the taboos are reinforced by elders and cultural leaders in the community.

In addition to taboos actually limiting the dietary diversity of children, the health worker reported cultural beliefs which associate malnutrition to other reasons than poor feeding. He told signs of malnutrition in children may be associated to evil spirits or bad neighbours. Hence, parents may not perceive better infant feeding as an important and the only cure to malnutrition.

Ignorance mentioned in the mothers’ FGD may be related to cultural beliefs or lack of time. Likewise, the lack of fathers’ participation may result from ignorance or lack of time. Interestingly, only mothers and the health worker saw the lack of father’s involvement as a barrier. The health worker argued that the lack of father’s involvement is critical because mother’s have an excess of responsibilities to care for alone. Father’s role in childcare will be discussed more widely in subsequent sections.

Another barrier related to the father was him being often the first one to eat, when the family ate together. This came up in the mothers’ FGD, but the mothers did not perceive it as a barrier, unlike the health worker. The mothers explained they let the father eat first and often the most nutritious food to show respect to him.

**Barriers to start complementary feeding timely**

Barriers to start complementary feeding timely included the lack of knowledge and lack of food discussed already. Two barriers affecting specifically the timely initiation of complementary feeding were the traditional herbs and the child refusing to eat. Traditional herbs could be given from the very first day to the baby, as discussed above.

When starting complementary feeding, it is normal to have the challenge of the baby refusing. Pointing out refusing as a barrier may indicate the mother’s inadequate capabilities, time, support and knowledge about starting complementary feeding.
**Barriers to breastfeed up to two years**

Frequent pregnancies were perceived as a barrier by mothers and the health worker because breastfeeding during pregnancy was not recommended after the fourth month. The health worker also brought up the issue of the new-born taking all the attention from the mother, thus leaving the siblings, even under two-year-olds, to less attention and care.

**Challenges when starting complementary feeding**

Challenges when starting complementary feeding may not be major barriers to good complementary feeding but were presented in all FGDs. Adverse effects mentioned were vomiting, diarrhea and constipation. Mothers mentioned time consuming as a challenge which indicates that mothers may not have time to feed the infant properly. Fathers rarely fed children, because they were not home. Therefore, children may not be used to the father feeding, as indicated by the grandfathers.

**Overall barriers**

Overall barriers present the barriers that could not be clearly categorized into other subclasses. Lack of health resources came up in the mothers’ FGD as well as in the health worker’s interview. Lack of health resources was described as understaffing at the health centre by mothers and long distance to health facilities by the health worker. The health worker elaborated the issue by revealing that there is no health program currently running in the Kirewa area and that the health care professionals have insufficient salaries and must pay work-related expenses from their own salary.

The overall barrier of too large families was clearly mentioned only by the health worker. He perceived it as a fundamental reason for poor complementary feeding and malnutrition in Kirewa. Frequent pregnancies lead to large families and the primary reason for frequent pregnancies was the lack of family planning. Family planning methods were not used because they were scarcely available, especially for remote communities, there was not enough knowledge about them and men were not involved in family planning. The health worker gave insight to men’s family planning attitudes by telling that most women use family planning services without their husband’s knowledge, to avoid domestic violence. His opinion was that health care workers have not involved men adequately in family planning services. Moreover, polygamous relations exist in the area and a man having several wives naturally increases the family size, which again is a challenge for good infant care and feeding.
6.3.2 Perceived benefits of good complementary feeding

The perceived benefits of good complementary feeding are presented in figure 8 below. Perceived benefits were mentioned in all FGDs. The benefits were categorized based on the different aspects of complementary feeding: appropriate diet, timely starting and continued breastfeeding up to two years.
Figure 8. Perceived benefits of good complementary feeding. The capital letters M, F etc. indicate which group of caretakers mentioned the benefit. M=mothers, F=fathers, GF=Grandfathers, GM=grandmothers, MX=mixed FGD, HW=health worker’s interview. CF = complementary feeding, BF = breastfeeding, EBF = exclusive breastfeeding.
Benefits of providing an appropriate complementary feeding diet

All the caretakers as well as the health worker mentioned benefits of providing an appropriate complementary feeding diet. Most of the perceived benefits were related to physical wellbeing, such as healthy growth. Still, some benefits related to mental or social wellbeing were brought up as well.

Preventing malnutrition, though could be thought an obvious benefit of an appropriate complementary feeding diet, was only mentioned by mothers and the health worker. This may suggest the other caretakers do not perceive malnutrition as a likely consequence of poor complementary feeding practices. Nevertheless, the caretakers mentioned prevention of some other negative outcomes as benefits of providing an appropriate complementary feeding diet. Among these were protection from diseases, prevention of parasites and prevention of bad behaviour, specifically, stealing food.

Other behaviour-related benefits were mentioned in the fathers’, grandmothers’ and mixed FGDs. Fathers thought providing an appropriate complementary feeding diet familiarizes children with different foods. Thus, fathers saw an appropriate complementary feeding diet as nutrition education. Likewise, satiety regulation and weight management were perceived as benefits in the mixed group. Grandmothers and the mixed group mentioned appropriate complementary feeding as a way to develop the parent-child relation.

The health worker was the only one to mention benefits to the mother in addition to the benefits for the baby. He explained that when preparing nutritious complementary feeds for the baby, the mother might eat some nutritious food herself. He also described that as the mother needs not to breastfeed as frequently when the infant eats complementary foods, she will have more time to do productive work.

Benefits of starting CF timely

From all the caretakers’ FGDs, only the mothers’ and the mixed FGDs reported specific benefits from starting complimentary feeding timely at six months. Most of these benefits were related to the benefits of exclusive breastfeeding and were already discussed in the “Perceptions of starting complementary feeding” -section above.
**Benefits of BF up to 2 yrs**

Perceived benefits of continued breastfeeding were mainly physiological and brought up only by the mothers and grandmothers. Again, mothers mentioned prevention of malnutrition as a benefit, which might indicate that they understand the risk of malnutrition. In the Kirewa area, where family planning methods often are beyond reach as described earlier, continued breastfeeding for two years and even longer is used as a contraceptive method.

6.3.3 Perceived susceptibility

The perceived susceptibility to negative health outcomes from poor complementary feeding is presented in figure 9 below. Perceived susceptibility was mentioned in the mothers’ and mixed FGD and background forms and in the health worker’s IDI.
Figure 9. Susceptibility to negative outcomes. The capital letters M, F etc. indicate which group of caretakers mentioned the factor. M=mothers, F=fathers, GF=Grandfathers, GM=grandmothers, MX=mixed FGD, HW=health worker’s interview.
The perceived susceptibility was considered in this study as susceptibility to negative outcomes, if good complementary feeding is not practiced. The susceptibility was not as evident in the background, FGD and interview data as were the perceived barriers and benefits. The worries related to children’s health and nutrition were categorized to the susceptibility construct of the HBM, because being worried for something indicates the subject of worrying is something likely or at least possible to happen.

Worries related to children’s health and nutrition were only asked directly in the first two mothers’ FGDs, which might explain why most of the caretakers did not express worries in the FGDs. The worries expressed were mostly negative outcomes that result at least partly from inadequate feeding: stunting, malnutrition and diseases. The other worries presented were causes to these negative outcomes: inadequate food and water and poor access to health care services.

Worries related to children’s health and nutrition were asked in the background form from all caretakers. These worries were related to all basic needs of children: food provision and feeding, education, clothing and shelter and hygiene. What stands out is that only mothers mentioned specific worries related to feeding: nutritious food and timely feeding. All other food-related worries were on a general level. One father expressed an issue about taking care of two babies of the same age from two different mothers. This confirms polygamy exists in the community and among the study participants.

The health care worker was not asked about worries, but about stunting. He pointed out that Kirewan children are susceptible to stunting and malnutrition.
6.3.4 Perceived severity

The perceived severity of negative health outcomes from poor complementary feeding is presented in figure 10 below. Perceived severity was mentioned in the mothers’ FGD and in the health worker’s IDI.

![Severity Diagram]

- Sickness and loss of appetite
- Children’s feeding worries
- Stunting not recognised severe
- Severity of poor feeding not understood
- Poor complementary feeding is risky

- Protection for future misfortune
- Poor feeding affects school performance
- Good feeding prevents diseases
- Good feeding prevents malnutrition

**Figure 10.** Severity of negative outcomes. The capital letters M and HW indicate which group of caretakers mentioned the factor. M=mothers, HW=health worker’s interview.
The perceived severity was considered in this study as severity of the negative outcomes if good complementary feeding is not practiced. Similarly with the susceptibility, severity of the negative outcomes was not quite evident in the data. Some of the worries related to children’s health and nutrition were categorized under the severity-construct, because they clearly demonstrated that the issue was comprehended severe. The other subclass of the severity-construct is reasons why good feeding is important. These reasons were mentioned already in the perceived benefits but equally demonstrated understanding of the severity of a negative outcome, such as malnutrition.

Worries related to the severity of a negative outcome were only present in the mothers’ FGD and the health worker’s interview. The sickness and loss of appetite and children’s feeding worries indicate that mothers understand the severity of a child not eating well.

The health worker revealed from a local point of view, how the caretakers perceive negative outcomes of poor feeding. He argued that local caretakers do not comprehend the severity of poor feeding or stunting:

“Most of them don’t take this [stunting] as to be something serious. Because they think, with time, the child, it will gain the height.” (Health worker interview)

The health worker told that consequences of poor feeding are often associated to something else than poor feeding, for example evil spirits or bad neighbours, as described in the barriers-section.

Some of the mothers’ perceived benefits can be also seen as a demonstration of severity as illustrated in the figure 10 above. Good feeding was mentioned to prevent diseases and malnutrition which are clearly perceived as something serious demanding preventive measures. Poor feeding was said to affect school performance, thus not being insignificant. The severity of poor feeding was demonstrated by a mother, who saw it as a possible cause for future misfortune:

“That it is good to introduce your baby at six months to other foods, because you can’t tell your future from there, anything can happen, death, sickness, and you know. If the baby has not been eating, that mean the baby might suffer.” (Mother, G4)
6.3.5 Cues to action

The cues to action for good complementary feeding are presented in figure 11 below. Cues to action were present in all FGDs.

**Figure 11.** Cues to action. The capital letters M,F etc. indicate which group of caretakers mentioned the cue. M=mothers, F=fathers, GF=Grandfathers, GM=grandmothers, MX=mixed FGD, HW=health worker’s interview.
The cues to action were categorized into two subclasses: learning from videos and intended change in behaviour. Participants reported learning both complementary feeding practices and perceptions from the videos. The learnt practices reveal which infant feeding practices were new to the caretakers: smashing the food, using a spoon to feed, mixing different food groups, starting complementary feeding with small portions and enriching porridge were not familiar to all caretakers.

From all the caretakers who participated in the study, the fathers were most active in reflecting the videos. Fathers mentioned learning issues related to the provision of food and family relations. Fathers perceived they should work hard to afford the foods recommended in the videos:

“-- *that the video also teaches me that I have to work hard, because some of those foods, to get them, it requires money.*” (Father, G6)

They reported learning how to feed the mother during and after pregnancy, which apparently was something new to the fathers. Many perceptions learnt were related to family relations: looking after children, caring for the pregnant mother, improving family relations and understanding the shared responsibility of child feeding.

As described above under the breastfeeding perceptions, the term exclusive breastfeeding was not completely understood by the caretakers and they reported learning the term from the video. Two mothers in the mixed FGD described that after learning from the video, they will not be giving water or porridge to babies under six months any more.

The intended changes in behaviour were statements participants made during the FGDs. Many of them were related to the issues they reported of learning. Fathers mentioned intended changes related to the wellbeing of the whole family: planting new crops, ensuring the family is well fed and improving love for the wife. One father described what the videos induced in him as follows:

“They have seen some types of foods, that they had even forgotten. It has taken time without eating those, like yams. -- And so he is going to look for the seedlings and he plants.” (Father, G6)
Source of knowledge

Related to the cues to action, are the sources of infant care and feeding knowledge (table 9). The caretakers were already familiar with many aspects of infant feeding and were asked where had they got this knowledge from. The sources of knowledge elaborate the data about cues to action as these might be sources of cues to action as well.

Table 9. Caretakers’ source of infant health and nutrition knowledge. The mixed group was not asked this question.

<table>
<thead>
<tr>
<th>Source</th>
<th>Mothers</th>
<th>Fathers</th>
<th>Grandfathers</th>
<th>Grandmothers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Straight feedback from child</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Fellow mothers</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Own parents</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Grandparents</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Health care professionals</td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Health centres</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>School</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Trainings / Nutrition sensitization</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Government manuals</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Automatic</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

Mothers, fathers and grandfathers had been advised by parents, grandparents and fellow mothers as well as health care professionals and educational institutions. Grandmothers did not mention parents as sources of knowledge but added government manuals about child feeding and nutrition as an information source. Health centres are presented separately from health care professionals, because mothers mentioned learning from posters at the health centre. All except mothers mentioned specifically World Vision trainings as a source of knowledge. One mother referred to the straight feedback from the child when deciding what to feed. One father thought some of the child care practices are automatic.
6.4 Family related factors influencing complementary feeding

To explore how the Kirewan caretakers perceive the role of children, the feelings of having children and the ideal child count were discussed in the FGDs. The caretakers expressed in the FGDs that children are helpful, they generate development and continuity and they bring respect from the husband and the community. The idea of a good number of children to have ranged from two to twelve.

What stood out, was the difference between the number of children perceived good to have and the actual number of children the caretakers had. The difference was greatest in the fathers’, grandfathers’ and grandmothers’ groups. The fathers were the only ones who thought the ideal number of children should be more than the amount they had. In contrast, grandfathers thought the good number of children to have would be much less that what they have. Grandfathers justified their idea of having less children on the limited resources and land area compared to the big families.

6.4.1 Gender roles related to producing children

The mothers’, fathers’ and the mixed FGD were also asked, who decides the number of children. Most mothers reported that they make the decision together with their husband or completely independently. Unlike the mothers, most men in their FGD reported that it is mostly them who decide the number of children and only to a lesser extent some women.

This question provoked a vivid discussion in the mixed group, where most participants stated that the number of children in a family is the father’s decision. The explanations given in the mixed group for who decides the number of children revealed issues related to gender inequality and traditional gender roles. One grandfather depicted the traditional gender roles as follows:

“-- So men have been recognized as superior being that his voice is supposed to be heard in the family and nobody can decline whatever he has said. -- The culture also places the man above the
"The woman is looked as a man’s property. So a slave cannot order the master.”

(Grandfather, G9)

Nevertheless, the same grandfather emphasized that the man should involve his wife when making the decision of the number of children to avoid having too many children. Likewise, a father expressed that the number of children should be a mutual decision discussed between the husband and the wife. Interestingly, one grandfather in the mixed group indicated that if the number of children is too big for the man to care for, the man will part the wife and leave the children to her alone to care for.

6.4.2 The role of father in child care

The role of father in child care invoked discussion in the mothers’, fathers’ and mixed FGDs as well as in the interview of the health worker. The GloCal video “What about dad” appeared thought-provoking for the participants. Participants in one of the mothers’ FGDs expressed that only some fathers participate in child care, and out of those, most fathers take care of only the first and second born child, as expressed by one mother:

“Like me for the first and the second born because the family is still small to handle. But after, when the family increases, the responsibility also increases. So it finds like, the stress is there, you’re supposed to look for this and that. So they [fathers] don’t have time for the babies.”

(Mother, G1)

Another mother stated that the lack of father’s participation in child care determines the number of children she wants to have:

“She is saying that maybe four is the right figure. Because men don’t support children. -- if she has four she can possibly take care of them by herself.” (Mother, G9)
These mothers gave various reasons for the lack of father’s participation in child care. They told fathers do not have time, fathers cannot handle the stress of caring for the growing family, they are too young when they become fathers, thus not ready for it, and some fathers think child care is the work for women. One mother stated that fathers do not have love for children.

Nevertheless, many fathers in the FGDs demonstrated their love for children by telling how they like to play with them, buy food for them and take care of the new-born.

The mixed and one mother’s FGD discussed whether the father can feed the children. Some mothers replied it is acceptable and they would actually like that the father fed the children. The reality was, however, that only some fathers fed their children, because fathers did not have time to feed children. Yet, mothers gave also reasons why some fathers do feed children: they want their children to grow and develop well, to make the child feel loved and to know the father.

In the mixed group the issue about father feeding children evoked disagreements between mothers, fathers and grandfathers. The mothers in the mixed group said fathers do not feed children whereas the fathers said they do. One of the fathers in the mixed group explained that fathers have no time to feed children, because they go to the trading centres and happening places where they might stay until late.

The significance of the father’s presence in child care was discussed in several FGDs. Mothers thought it is good that the father spends time with the children because it shows the man loves the child and also enables the child to develop love for the father. Nevertheless, mothers thought only those fathers who have been trained understand these benefits of spending time with the child.

The fathers, in turn, perceived being with children important because they could educate them, teach them respect, learn to know their children and the children could also get to know the father. Fathers also said that they can show love for the children, that playing with the children develops the child’s strength and that it is very important to be close to the children because then they will also tell all their problems to the father.
6.5 Perceived solutions to solve the poor complementary feeding situation

Mothers and the health workers expressed solutions to the complementary feeding barriers. The solutions are summarized in table 10 below.

**Table 10. Solutions to complementary feeding barriers**

<table>
<thead>
<tr>
<th>Mothers</th>
<th>Health worker</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less children to ensure arable land resources</td>
<td>Using locally available food stuffs</td>
</tr>
<tr>
<td>More people should cultivate land</td>
<td>Using cheaper alternatives for meat and fish</td>
</tr>
<tr>
<td>Promoting horticulture for diversity</td>
<td>Nutrition demonstrations with local foods</td>
</tr>
<tr>
<td>Men should educate their children and acquire more land</td>
<td>Nutritional clubs to promote complementary feeding in the communities</td>
</tr>
<tr>
<td></td>
<td>Getting men involved in nutritional issues</td>
</tr>
<tr>
<td></td>
<td>Sensitize elders and cultural and religious leaders</td>
</tr>
</tbody>
</table>

The solutions the mothers brought up were targeted to the local community: how they should cultivate more land, engage in horticulture, produce less children and educate them. These solutions were related to the resources and demonstrate that mothers perceive poor complementary feeding as a question of inadequate resources. The solutions of the mothers also depict how strictly the local caretakers are bound to the land resources.

The health worker, on the contrary, stated solutions related to better service and knowledge delivery to the locals and in addition, two food related solutions. The health worker’s solutions of getting men involved and sensitizing elders are related to the barriers of lack of male involvement and adverse cultural beliefs that were discussed earlier.
7. Discussion

7.1 Reflection on the study findings

The aim of this study was to explore in the light of the Health Belief Model how do families in Kirewa, Uganda regard complementary feeding and how do they currently practice it. The main findings indicate that the complementary feeding practices of local caretakers who participated in this study were suboptimal. Local caretakers recognised benefits and barriers as well as susceptibility, severity and cues to action related to complementary feeding.

7.1.1 Complementary feeding practices

Breastfeeding was the most common feeding practice of infants in this study. Duration of breastfeeding varied significantly, which might partly be due to misunderstanding the question to concern exclusive breastfeeding, though the question focused on breastfeeding over all. Still, only three out of the 34 respondents had breastfed for less than eight months and almost two thirds had breastfed for at least two years.

These findings are slightly different from the Ugandan DHS 2016 (6) which examined current breastfeeding in Ugandan households. According to the DHS, 43,2 % of children were breastfed at two years, which is less than in this study (62 %) (6). Regional data from the larger region (Bukedi), where the Kirewan study site was located, indicated that the median breastfeeding duration was 20 months (6).

Participants in this study breastfed for longer than the regional average, which might be partly explained by the rural setting, as the last DHS found, that children in rural areas are breastfed longer than in urban areas (6). Continued breastfeeding seems not to be a major challenge in the study area, as most of the children were breastfed for two years, just as recommended by WHO (2).

Starting complementary feeding may be an issue to concentrate on when aiming to improve infant nutrition in Kirewa. Though most participants reported starting complementary foods at the age of six months, some comments in the FGDs suggested, that complementary feeding may be started
much earlier with liquids and traditional herbs. Some participants expressed they had to start complementary feeding too early because they lack breast milk. On the other hand, some started later than at six months, even not until one year, because they had nothing to give in addition to breast milk. These findings are supported by prior data of too early and too late complementary feeding initiation in Uganda (6,121).

The foods described as the first ones given to a child were mostly starchy foods (porridge, rice, potato etc.) and drinks, such as tea, sugar water and cow milk. Similar foods were described to be given as complementary foods for children in Ghana and Ethiopia (122,123).

The participant’s ideas of good first foods included more animal based and diverse foods than what they reported giving for infants. This might indicate caretakers understand the need for diverse complementary foods, but poor availability restricts the diet. The dietary diversity of a child may still increase with age, as the foods given to under two-year-olds by the study participants were more diverse than the first foods.

According to the Kirewan health worker, dietary diversity of complementary foods is an issue in the area. Mothers mostly give a non-enriched porridge made from only millet flour, because other foods need to be bought. These findings are in line with the results of the Ugandan DHS, were most common food groups given to children under two were grains and other drinks than milk (6).

The complementary feeding diet diversity among caretakers in this study appears to be far from the recommended. Special concerns are related to the small amount of animal-based foods and the use of low-nutrient-value drinks, such as tea and sugar water (2). Similarly, the Ugandan DHS estimated that only 30 % of complementary fed children were fed according to minimum dietary diversity, that is, at least four food groups per day (6).

Reasons to give mentioned foods were categorized into constraints in food supply, effect on child’s health and development of the child. Interestingly, nutritional benefits did not arise in the fathers’ FGD when discussing reasons to give mentioned foods to infants, but when discussing the foods good to give, nutritional reasons came up. This might be explained by the poor ability to apply nutritional knowledge to the available food stuffs. In other words, caretakers understand that some foods they lack would be ideal for the children but do not understand how they can use the locally available foods to form a diverse diet.
According to Engle et al. (22) and the WHO guidelines for complementary feeding (2), one important aspect of good complementary feeding is the feeding style, which should be responsive (2,22). There were indications of a responsive feeding style in this study, as some caretakers told the immediate feedback from the child influenced what foods they fed. Also, in the case of the child refusing a food, the caretakers had multiple techniques to continue feeding in a responsive manner. Nevertheless, some mothers and grandmothers reported using force in feeding as a technique to overcome refusing. This suggests a controlling feeding style, which might be detrimental for the child (22).

7.1.2 Complementary feeding perceptions

Adequate dietary diversity is a crucial factor in complementary feeding (2). However, the idea of dietary diversity, or a balanced diet, as it was described locally, was not thoroughly understood among the study participants. A child’s need for a balanced diet was well pronounced among participants, but the definition they gave lacked the central idea of having diverse foods in every meal. Nevertheless, the participants could explain the idea of a balanced diet fairly well, given that the concept of dietary diversity was suggested the most difficult to understand among low-income mothers in a complementary feeding education intervention (92).

As described above, initiating complementary feeding too early or too late was a challenge among the study participants. Initiating complementary feeding before the recommended six months was justified by the lack of breast milk which compelled the caretakers to start complementary feeding. One caretaker thought complementary feeding could be started irrespective from the age, judging on the behaviour of the child. Similar ideas were reported in a study of Bangladeshi mothers who thought that complementary feeding should be started before six months because breast milk is insufficient or that it could be started upon refusal to breast milk (124).

Despite some caretakers not initiating complementary feeding timely, most of the caretakers in this study claimed to start complementary feeding at six months. Reasons to start at six months were mainly physiological and demonstrated a good understanding of the development of an infant.
7.1.3 Perceived barriers to good complementary feeding

Poverty and food insecurity
Poverty was one of the most often mentioned barriers for good complementary feeding. In contrast, the Kirewan health worker did not agree with poverty being the greatest barrier. The caretakers in this study might have used poverty as a defence for not thinking about other, more complex and self-dependant barriers for good complementary feeding. This resembles the findings from India by Engle (51), who argued that one of the major barriers for appropriate child nutrition is perceiving the lack of food as a main barrier instead of lack of care or feeding practices. Parallelly, Hadley (54) suggests that fixing the lack of material resources is not sufficient alone to meet complementary feeding recommendations.

Obviously, poverty has a critical role in the poor complementary feeding situation in Kirewa, where 80% of the population live below the margins of poverty (107). Yet, it seems that only major improvements in income might enhance complementary feeding. Though adequate dietary diversity of the complementary fed child was associated with wealth, only children from the highest wealth quintile had better odds for receiving an adequate dietary diversity in the analysis of the 2011 Ugandan DHS data (5). There was no significant difference in dietary diversity between children from the second, third and fourth wealth quintiles when compared to the first one (5). This suggests small improvements in income alone would not enhance the dietary diversity of complementary feeding.

According to the World Vision assessment report on Kirewa, underlying factors for poverty in the region include degrading soil fertility, poor farming methods, pests, unreliable weather and using low yielding crops (107). Poverty, lack of agricultural resources and food insecurity are thus intertwined and omnipresent threats in the Kirewan community which relies heavily on subsistence farming. Correspondingly, lack of food, lack of arable land and unpredictable weather were mentioned as barriers in the FGDs of this study. Household food insecurity emerged as a barrier for appropriate infant and young child feeding also in a review of qualitative studies in low-income countries (44).

Food insecurity not only constrains the food supply, but also constrains the care for the infant, as mothers’ workload expands in food insecure environments (125). The heavy burden of agricultural, household and child care work that mothers have may impair their ability to provide
adequate child care (49,126). Similarly to many other developing countries, also in Uganda women contribute more to agricultural work than men (127). Still, mothers in this study did not mention the high burden of other work and responsibilities as a barrier for good complementary feeding. Interestingly, the Kirewan health worker pointed this out and stated that women have more responsibilities than men and that the lack of male involvement in child care is a barrier for good complementary feeding.

*Lack of father involvement in child care*
Although mothers did not perceive their heavy burden of work as a barrier in this study, they did perceive the lack of male involvement in child care as a barrier for good complementary feeding. This finding is in line with earlier studies in Uganda (50,52). Cultural norms regarding child care as women’s work and the fact that mothers spend more time with young children, because men tend to work outside of home, contribute to the unequal distribution of child care responsibilities (52,128,129).

In this study, the health worker saw involving men in nutritional issues as one solution to poor complementary feeding practices. Male involvement in child care was, indeed, shown to have a positive effect on child nutritional status in a previous study in Uganda (128). The mothers in this study as well as the study of Ickes et al. (52) wished their husbands would be more present in child care activities. Respectively, the fathers in this study also valued spending time and being present with the child. Therefore, there seems to be a positive atmosphere for sharing child care responsibilities between the parents in the study area.

Prior research in Uganda suggests, that men do not know enough about child feeding in order to support their wives (128). In this study, the Kirewan health worker stated that both parents lack knowledge about proper feeding, which was especially apparent when discussing dietary diversity. Lack of knowledge about breastfeeding and complementary feeding was found a major barrier to appropriate IYCF also in a qualitative study in rural Uganda (50).

*Adverse cultural beliefs*
Related to the lack of correct knowledge lies another barrier. Cultural beliefs, myths and taboos contradicting with current complementary feeding recommendations were present among the study sample, for example, in the form of traditional herbs given to infants at any age. The local health worker perceived these as one of the most important barriers, but also the mothers and fathers mentioned them as barriers in their FGDs. The health worker suggested that to fight off
the taboos, the elders and cultural leaders of the community should be sensitized. This reminds a finding of a former study in Uganda, where community elders and respected people reinforced cultural practices (50). Therefore, it is important to target the complementary feeding messages to grandparents and other elders in the community in addition to primary caretakers.

The health worker indicated in his interview that there is a myriad of cultural beliefs and taboos related to maternal and child nutrition. Likewise, a recent review stated that restrictive perinatal diets are a significant concern in many areas, as more foods may be restricted from than allowed to mothers (130). Nonetheless, these cultural beliefs and practices stem from local ideas of how child feeding promotes health (131). Therefore, the local ideas and practices should not be understated but taken into account when promoting the recommended complementary feeding practices.

**Gender norms and lack of family planning**
Another cultural factor influencing the complementary feeding situation in the study area was gender norms. According to local gender norms, men are superior over women and a wife must respect her husband. This respect was demonstrated, for example, in the eating order in a family. Mothers told in their FGD that they let their husband eat first from the whole family, even before children, to respect him. Men were told to be offered the most nutritious food, such as the biggest pieces of meat. These observations of patriarchal gender norms are supported by prior research in Uganda (132,133).

A qualitative research found that gender norms affect how adolescents use family planning services (133). Gender norms were brought up in the FGDs in this study when discussing family planning. The barrier of too large families and lack of family planning services was clearly expressed by the health worker and could be read between the lines when the caretakers discussed parity issues.

Lack of family planning services results in high parity and small birth intervals which have been associated with infant malnutrition and mortality (134). In a qualitative study in Bangladesh, mothers themselves perceived small birth intervals as a barrier to breastfeeding (135). Too large families and small birth intervals were perceived as barriers for good complementary feeding also in this study. The mothers suggested having less children as a solution to ensure adequate arable
land for food security. In addition to solving the concrete lack of family planning methods and services, the health worker reminded in his interview that fathers need to be involved in family planning.

7.1.4 Perceived benefits of good complementary feeding

The study participants mentioned mainly benefits affecting physical health, such as growth and development of the body. Development of the brain was mentioned in several FGDs as well as better school performance. Seems that the participants have understood the importance of good complementary feeding for growth, health and behavioural development. These benefits mentioned are in line with the WHO guidelines for complementary feeding which state that adequate complementary feeding is a requisite for optimal development in all domains (2).

In addition to the benefits for physical health, which are probably most apparent, also mental and social benefits for the child were mentioned in the FGDs, such as good complementary feeding for the development of eating habits, satiety regulation, weight management and the parent-child relation. Mentioning these benefits suggests that the participants apply a responsive feeding style and understand the benefits of it (22).

What is alarming, the benefit of good complementary feeding in preventing malnutrition was weakly understood. It was mentioned only in one mothers’ FGDs in addition to the health worker, who revealed that malnutrition is often associated to other reasons than poor feeding. Yue et al. (55) had similar findings in China, where caregivers did not understand that malnutrition is caused by poor feeding (55). This is clearly something to target nutrition education on.

7.1.5 Perceived susceptibility and severity

While the perceived barriers and benefits were abundant in the data, the susceptibility and severity were scarcely present. In other words, the participants brought up eagerly the positive effects of good complementary feeding and what hinders them from practicing it but did not express the negative effects of poor complementary feeding nor their children’s risk for these negative effects.
This might be due to the nature of complementary feeding, being a normal and even automatic practice of child care, which is not necessarily considered as a health behaviour preventing malnutrition. Also, though good complementary feeding has immediate effects on the child, the longer-term health benefits that show in adolescence and adulthood are difficult, if not impossible, to associate with good complementary feeding (54). Similarly, the gradually developing negative outcomes of poor complementary feeding may not be associated with the seemingly trivial feeding practices.

Complementary feeding is not clearly a preventive behaviour for a certain disease or symptom, like those behaviours the Health Belief Model was originally designed for (70). In the case of poor complementary feeding, caretakers may not be as aware of the negative health outcome as in the case of, for example, neglecting vaccinations or screenings. The caretakers of this study not being aware of the negative outcomes of poor complementary feeding might explain why they hardly brought up issues related to the susceptibility to or severity of poor complementary feeding.

Nevertheless, all caretaker groups expressed worries related to child health. These worries were majorly not related to complementary feeding, though “good feeding” was mentioned as a worry. Only mothers expressed specific worries related to complementary feeding. This suggests mothers have the best understanding of the aspects of infant feeding and thus feel susceptible of not practicing complementary feeding correctly.

Malnutrition, diseases and stunting worried the mothers in this study, which implies they felt their children are susceptible to these negative outcomes. Mothers being concerned about their children’s sickness and loss of appetite indicates they understand the severity of a child not eating well. These worries were brought up only in the mothers FGDs, perhaps because mothers feel more responsible for the feeding of the child.

The question remains, do other caretakers than mothers understand their children’s susceptibility to malnutrition and stunting and the severity of these negative outcomes? Although mothers seemed to recognize the severity of malnutrition, diseases and stunting, they did not demonstrate understanding of how poor complementary feeding leads to these outcomes, nor did the other caretakers. The health worker concluded local caretakers do not comprehend the severity of poor feeding or stunting.
Only few prior studies have concentrated on the perceived severity or susceptibility of poor complementary feeding. However, the findings from those studies are similar to this study. One study in Ghana and another in China concluded that most mothers and caregivers failed to understand the severity of the negative outcomes of poor complementary feeding (122,55). Based on her research in India, Engle (51) proposed that not recognizing the lack of feeding and care practices as the main causes for malnutrition is one of the major barriers for appropriate infant and young child feeding (51).

The lack of perceptions of severity and susceptibility may be one factor behind the poor complementary feeding practices among the study participants. This is supported by the findings of Debela et al. (13..) from Kenya. Debela et al found that maternal knowledge on the health consequences for not following recommended dietary practices was associated with the height for age for children. That is, understanding the severity of poor feeding practices was associated with better growth. The findings of Debela et al., other previous research presented above and this study support concentrating nutrition education on increasing the awareness of the health consequences of poor feeding.

According to the HBM, the susceptibility and severity form together “the readiness to act” which motivates the health behaviour (71). Therefore, understanding the susceptibility to and severity of poor complementary feeding is a crucial step to better complementary feeding practices. Rosenstock (71) and Michie (66) also state that when the readiness to act is weak, more intense cues to action are needed to trigger the individual to perform the health behaviour.

7.1.6 Cues to action

The study participants reported learning new complementary feeding practices but also ways to improve family relations from the GloCal videos. This suggests that the videos indeed influenced the participants. The videos even triggered intended changes in behaviour among some of the participants, who stated changing their behaviour after seeing the videos. For some, the videos also served as memory clues, reminding of the use of some foods they had forgotten.

However, there were some differences in how eagerly the caretakers discussed the videos, the fathers being the most eager. Compared to the other caretakers, the fathers gave more
statements about changing their behaviour after seeing the videos. The fathers expressed many thoughts how they would improve infant feeding and care for the mother and the child after seeing the videos. Generally, the fathers in this study seemed willing to improve maternal and infant care and feeding practices.

The importance of involving men in maternal and health care issues is supported by recent research. Involving men appeared to enhance maternal and child health via several mechanisms in a recent review article (137). However, men involvement must be carried out carefully to avoid negative effects, for example, on maternal autonomy (137).

The GloCal videos had an influence on the local caretakers and seemed to work as cues to action for better complementary feeding practices in this study. Moreover, the videos encouraged some of the participants to enhance their family relations and share the responsibility of child care. The good reception the GloCal videos met in this study is not surprising, considering prior research on videos in health behaviour change interventions (138-140). Two review studies concluded however, that videos have not had uniformly positive effects on diverse health behaviours (141,142). In their review, Abu Abed et al. (142) emphasized that the presentation techniques in the video and complexity of the target behaviour determine the effectiveness of the video.

Ramsay et al. (143) found six characteristics of child feeding videos that enhanced motivation and learning: 1. using real scenarios, 2. providing short segments, 3. presenting simple, single messages, 4. delivering a skill in action, 5. having a setting participants can identify with and 6. supporting conceptualization of the information (143). These six characteristics are achieved in video modelling.

Video modeling appears to be a promising technique to initiate health behaviour change (141,144). Video modeling is defined as demonstrating the target behaviour actively with real actors in a real setting (144). The GloCal videos include modeling of the desired complementary feeding techniques in a culturally appropriate setting.

In a community where infant feeding is openly present, complementary feeding practices may be learnt socially already years before having own children by the means of observing how caretakers in the surrounding community practice it (54). In resource-poor settings, these socially learnt complementary feeding practices are seldom optimal (54). Based on the findings from this study, complementary feeding practices among the Kirewa caretakers were not optimal. The video
modeling provided by the GloCal videos may serve as an important alternative for the cultural model of complementary feeding in the Kirewa area. Videos might be an appropriate tool to promote complementary feeding practices, as benefits of good complementary feeding are not immediate, and thus cannot be learnt by a trial-and-error learning model (54).

7.2. Evaluating the use of the Health Belief Model in this study

The five constructs of the HBM were diversely apparent in the analysis of the study data on complementary feeding. The barriers and benefits were well presented in the data. The cues to action were fewer and almost entirely related to the GloCal videos shown in the FGDs. In turn, the perceived susceptibility and severity were difficult to distinguish in the discussion data.

Previous quantitative studies on eating behaviour and the HBM have had varied findings on the predictive value of perceived susceptibility and severity constructs (145-147). No qualitative studies discussing the perceived susceptibility and severity in relation to eating or feeding behaviours were found.

The HBM has been applied to diverse health behaviours most of which, however, have been preventive health behaviours, sick-role behaviours and using of screening services (73,148). Eating or feeding behaviours have rarely been in the focus of the HBM and only two studies where the HBM was applied to the complementary feeding context were found for this study. The two Ethiopian studies which applied the HBM were interventions and the HBM was used in the intervention design (91,92). Qualitative complementary feeding studies applying the HBM were not found for discussion. This is not surprising as the HBM has some characteristics, which makes applying it to the complementary feeding context challenging, as discussed earlier in relation to susceptibility and severity.

There were several advantages for using the HBM as a theoretical background in this study. The HBM identified well the barriers for complementary feeding among study subjects. The HBM revealed that longer term benefits of complementary feeding are not completely understood among the study sample. What is more, the HBM brought up the absence of the perceived susceptibility and severity, that is, readiness to act for poor complementary feeding. This is an important finding which can guide future programs on infant nutrition in the area.
There are some uncertainties related to the use of the HBM in this study. The question remains, does the HBM fit the complementary feeding context in a culture very different from where the model was created. The HBM itself does not include a culture-specific construct which would clearly take into account the normative and cultural determinants for health behaviour (149). Therefore, it is essential to modify the HBM and its construct to the target culture (150). In this study, the FGD guide was designed bearing in mind the local context and the HBM, thus applying the HBM to the local culture.

### 7.3 The reliability, validity and relevance of the study

Reliability and validity are often used as quality criteria also for qualitative research, even though their use has been criticized because they have been developed in the context of quantitative research (151). However, for the evaluation of this study, reliability and validity are discussed. In addition, other factors of the study will be reflected on, as proposed by Tuomi and Sarajärvi (151).

The reliability of this study is increased by explaining the study methods in detail, providing the FGD discussion guides and extracts of the study data (152). Theoretical transparency, ensured by the descriptive figures of how the HBM was applied in the analysis, contribute to the reliability. However, the reliability of the analysis was not confirmed by another researcher, as suggested by Silverman (110). On the other hand, the analysis was conducted in two separate reading sessions by the same researcher, which does promote the reliability of the findings (152). Another factor weakening the reliability of the study is the transcription of the FGD audiotapes. Some significant pauses, overlaps and non-verbal reactions may have been ignored in the transcription, especially as the transcriptions were not checked by another researcher.

The impact of the researcher on the setting and the subjective values of the researcher undeniably influence the validity of the study. These issues are always present particularly in cross-cultural research and cannot be eliminated but merely taken into account. In this study, the use of the local health worker as interpreter in the FGDs increased their validity. The validity of the analysis was enhanced by analysing a small data-set first (the mother’s FGDs) and comparing later analysis to the scheme that was created in the analysis of the mothers’ FGDs. Using an established theory for the analysis and comparing results also increases the validity of this study (152).
In addition to the validity and reliability, Tuomi and Sarajärvi (151) suggest considering the following factors when evaluating a qualitative study: the target and aim of the study, the data collection, the informants of the study, the researcher-informant relation, the duration of the study, the data analysis and the reporting of the study. These will be discussed in more detail below.

Complementary feeding perceptions and practices were the target of this research because of the interest of the researcher. Prior research also demonstrated the poor complementary feeding situation in Uganda, but there is a lack of research on the underlying perceptions and reasons for poor complementary feeding practices. The data collection method and technique were justified by the aim of the study, as described in detail in the Methods-section.

The informants of the study were caretakers of children below 2 years old, because they were assumed to have the most current experiences and views of complementary feeding. The recruitment of informants was carried out by a local health worker and the entire sub-county was presented in the sample. The relation between the informants and the researcher was weak, because the researcher was a complete stranger and came from a different culture than the informants, as discussed further below in the limitations-section.

The data was collected during a limited three-week time period in July 2017. A longer field work period would have enabled several FGDs and the transcription of the audiotapes near the study site, with the possibility to contact the translator. The data analysis was deductive and based on the HBM and has been presented with examples in this report. The report of the study has been written by the researcher herself and includes extracts from the FGD data as well as the deductive analysis, which increases the reliability of the study.

7.3.1 Limitations of the study

Limitations in time and other resources available for data collection were the root for all limitations in this study. In addition, FGDs, like all research methods, have some intrinsic limitations, which are shortly described in the context of this study.
**Language barrier**

When conducting qualitative research in a foreign culture and language, the language barrier might affect heavily the validity of the data (153). In this study, the language barrier between the FGD moderator and participants caused some sources of uncertainty to the data.

The FGDs were held in English with the health worker interpreting simultaneously in the local language, Japhadola. FGD participants had diverse levels of English, as some participants discussed almost fluently in English, while others hardly understood it. Therefore, some FGDs were entirely dependent on the interpreter, while other groups discussed partly in English. Non-English speakers may have been more silent in the partly English-speaking groups, because the participants’ speeches in English were not translated back into Japhadola. What is more, all the discussion was not interpreted in English. The health worker translated passages that he estimated important for the FGD. This means, some interesting passages might have been left out from the data.

Having the interpreter translate the discussion questions changed the nature of the focus group from a discussion to resemble more a group interview. The idea of an FGD is to mimic a natural discussion (111), which is lost with the language barrier and the use of an interpreter. Also, many participants seemed to regard the FGD as a lecture or teaching moment and were thus perhaps not in ease to express their opinions. The seating of the FGD participants in rows in front of the moderator might have contributed to a lecture-like atmosphere. However, the benches at the study site were bolted to the floor and could not be moved to a more agreeable circle position for the discussion.

The authenticity of the discussion might have been affected by the presence of the interpreter and especially the moderator who was a foreigner. Though the health worker was familiar to the participants, his presence may have affected the discussion. The so called “social desirability bias”, caused by the lecture-idea, the presence of the moderator and the health worker, most presumably affected what was said by the participants.

According to the health worker, who recruited the FGD participants, some participants had false expectations for the FGDs. While recruiting, the health worker faced expectations related to getting some financial support or schooling for children on behalf of the research, probably because the research was conducted by a European (or white=mzungu). To redress these
The health worker explained that the FGD is for research and education purposes. The participants thus expected receiving some education or teaching in the FGDs.

As in all studies, all people recruited could not participate in the study due to, for example, the burden of agricultural work during the rainy season. The participants in this study may have been already more interested in infant care and feeding issues than those who refused to participate. This type of selection bias can hardly be avoided in any non-randomized research, especially in qualitative work (154).

Illiteracy affected the collection of the background data. Some participants were illiterate and based on the background questionnaires, literacy skills were generally poor among the participants. Though the health worker and note taker assisted participants to fill in the background forms, all participants did not receive help, as some questions were clearly misunderstood and one of the participants’ forms was not readable at all.

**Inexperienced research staff**

The moderator of the FGDs as well as the interpreter and note-taker were non-professionals and had little or no experience in focus group research. The note-taker and interpreter were orientated to the FGD setting and its requirements by the moderator. Two pilot FGDs for mothers were organized during which the moderator and interpreter could practice their skills. Note-taking requirements were scrutinized with the note-taker prior to her first FGD.

Still, the inexperience of the interpreter, note-taker and moderator shows in the data. The interpreter did not stay completely objective and interfered in the discussion as well as tried to moderate the discussions. This might be due to his role as the local health worker.

The notes taken were not in accordance with the audiotape in some parts of the FGDs. In many FGDs, the moderator posed several questions at a time. This made the discussion more difficult for the participants and complicated the transcription of the audio data. At times the moderator used non-objective probes, such as “yeah, that’s good”, which might have given the participants the impression that some ideas are better than others.

Though the design of the FGD discussion guide was carefully planned, it had some deficiencies. The susceptibility and severity were not as evidently asked in the discussion questions as were the benefits and barriers. There was a methodological inconsistency regarding the susceptibility, as only the mothers were asked directly about worries related to their children’s health. Besides,
there is a possibility that the FGD discussions and background forms were not sensitive enough to collect the perceptions of susceptibility and severity. This might partly explain the lack of susceptibility and severity perceptions in the data.

**Limitations of FGDs as a research method**

Like all research methods, FGDs have some methodological limitations. These were discussed in detail in the Methods-section. Especially apparent in this study was the challenge of not all group members participating equally in the discussion. Some participants might have had opposing views of the matters discussed and did not dare to express them under the social pressure of the group. The opinion of the silent members in the FGD was thus not heard. As a result of the FGD method and a natural-like discussion setting, not all FGD were posed the same discussion questions, and thus cannot be compared.

When interpreting the results of this study, it is important to keep in mind that, as a qualitative study, the results do not represent anything else than what was said by the participants in this study. They cannot be generalized and have no statistical significance. Also, the analysis of qualitative data is always subjective to some extent. Therefore, another research could have made different findings from the data in this study. However, the analysis was performed two separate times with several months in between to yield a more valid analysis.

### 7.3.2 Strengths of the study

In spite of its limitations, the study certainly adds to the understanding of the complementary feeding perceptions and practices in a rural Ugandan setting. Prior to this study, no qualitative studies have applied the HBM to complementary feeding behaviour. Therefore, the present study has some theoretical contribution in the field of health behaviour research. Using the HBM as a theoretical framework also made it possible to compare the results from this study to other studies that have applied the HBM, building some generalizability for the study findings (67). Theory use also helps to structure the complexity of health behaviour, which is well apparent in the case of complementary feeding, a complex set of behaviours and practices (66).

Another advantage of this study was involving fathers and grandparents in the FGDs in addition to mothers. Previous studies have emphasized the need to involve fathers and grandmothers in
infant care studies and programmes (118,128). Thus, the study contributes to the yet weak understanding of caretakers’, other than mothers, role in infant care.

There were some methodological strengths in this study as well. Using the GloCal videos as an activation tool in the FGDs kept the participants focused and provoked discussion. Discussion between the moderator and the FGD participants was enabled by using the interpreter who simultaneously translated the discussion. Simultaneous interpreting in FGDs allows the moderator to guide and redirect the discussion in response to what the participants say and thus go deeper into the discussion topics (153).

FGD is not perhaps the best method to examine delicate issues, such as personal barriers to infant care in the case of this study. The background forms offered a confidential opportunity for the participants to express their challenges and worries related to infant feeding. Therefore, including questions on infant feeding into the background forms was a merit in this study.

Besides the contributions to the fields of infant nutrition and health behaviour research, this study has significance for the local community. The findings from this study will be shared with the local health worker. The GloCal videos were left to the community to use as instruction material in maternal and child health. Moreover, the local caretakers, who participated in the FGDs, saw them as something valuable, as stated by the health worker:

“People coming out from the FGDs were happy. They thought it was the best they ever had because of the videos and how they connected to what was discussed.” [Health worker interview]
8 Conclusion of the study

The aim of this study was to explore complementary feeding perceptions and practices in the context of the Health Belief Model and to gain understanding on how to promote health behaviour change for better complementary feeding.

The findings from this research demonstrate that complementary feeding practices were suboptimal among the study participants in relation to timing, dietary diversity, consistency and feeding frequency. The importance of complementary feeding as a health behaviour preventing malnutrition and stunting was not understood. The study findings are summarized in figure 12 below.

The HBM was applied successfully in the FGD discussion guide and the data analysis. Use of the HBM revealed the lack of perceived susceptibility and severity among caretakers. This is an important finding, because reinforcing the susceptibility and severity could motivate the local caretakers to adopt better complementary feeding practices, that is, develop readiness to act. Barriers were well identified with the use of the HBM as was the lack of some benefits, such as prevention of malnutrition. Based on the findings of this study, the GloCal videos may work as cues to action for better complementary feeding practices.

This study described the complementary feeding perceptions and practices in the light of the Health Belief Model in a rural setting, in Kirewa, Uganda. The HBM was found applicable to the complementary feeding context as well as the study setting. Based on the current findings, future research and programs should concentrate on messages about the susceptibility of children to detrimental consequences of poor complementary feeding and their seriousness as well as methods to provide the cues to action for better complementary feeding.
Figure 12. Summary of the study findings
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Aliisa Hyvönen
Helsinki, 29th March 2019
10 References


52. Ickes SB, Heymsfield GA, Wright TW, Baguma C. ‘Generally the young mom suffers much:’ Socio-cultural influences of maternal capabilities and nutrition care in Uganda. Matern Child Nutr. 2016;20: e12365


102. Human Development Indicators Uganda. UNDP; [cited 9.8.2018]. (Human

103. Human Development for Everyone. Briefing note for countries on the 2016 Human
http://hdr.undp.org/sites/all/themes/hdr_theme/country-notes/UGA.pdf


107. World Vision Uganda, Kirewa Assessment Team. Kirewa Assessment Project

108. Family Health International, Mack N, Woodsong C, United States, Agency for
International Development. Qualitative research methods: a data collector’s field guide.

109. Simon Carter, Lesley Henderson. Approaches to qualitative data collection is social
sciences. In: Handbook of health research methods Investigation, measurement and

110. Silverman D. Interpreting qualitative data: David Silverman. Fifth edition. London:
SAGE; 2014. 489 p.


113. Bowling A, editor. Handbook of health research methods: investigation,


Background Questionnaire
for mothers members who were invited to participate in focus group discussions in a study of complementary feeding perceptions and practices.

Thank you for your participation in this complementary feeding study. Some questions on your background and family are asked in this form. The answers will only be used for this research and will not be shared to anyone else except the researchers. Please feel free to ask questions you may have about this form / the whole research.

Name: __________________________________________________________________________

1. Education level (circle the option best describing your situation):
   A) less than primary school
   B) primary school (1-7 years of school all together)
   C) lower secondary school (8-11 years of school)
   D) higher secondary school (12-14 years of school)
   E) higher than high school (more than 15 years of school & higher education)

2. How many persons live in your household? What are the roles of these persons? (eg. Father of children, grandmother, father-in-law....)
   __________________________________________________________________________
   __________________________________________________________________________
   __________________________________________________________________________

3. Number of children in family: __________________

4. Date of births / ages of children:
   _____________________________ _____________________________
   _____________________________ _____________________________
   _____________________________ _____________________________
   _____________________________ _____________________________

5. Did you breast feed your baby? (circle the right option in your situation)
6. If yes, how long did you breast-feed your baby?
__________________ (months and years)

7. At what age did your (youngest) child get his/her first taste of food other than breast-milk / formula?
__________________ (age in months and years if full years of age)

8. What was the first food(s), other than breast milk, you gave to your child?
________________________________________________________________________________
________________________________________________________________________________

9. Did you have challenges when giving the first foods to your baby? How did you manage them?
________________________________________________________________________________
________________________________________________________________________________
________________________________________________________________________________

10. Are you concerned about your child's / children's health and nutrition? If yes, how?
________________________________________________________________________________
________________________________________________________________________________
________________________________________________________________________________
________________________________________________________________________________

Thank you for your responses!
Background Questionnaire
for fathers who were invited to participate in focus group discussions in a study of complementary feeding perceptions and practices.

Thank you for your participation in this complementary feeding study. Some questions on your background and family are asked in this form. The answers will only be used for this research and will not be shared to anyone else except the researchers. Please feel free to ask questions you may have about this form / the whole research.

Name: ________________________________________________________________

1. Education level (circle the option best describing your situation):
   A) less than primary school
   B) primary school (1-7 years of school all together)
   C) lower secondary school (8-11 years of school)
   D) higher secondary school (12-14 years of school)
   E) higher than high school (more than 15 years of school & higher education)

2. Number of children in family: ____________________

3. Date of births / ages of children:
   ____________________   ____________________
   ____________________   ____________________
   ____________________   ____________________
   ____________________   ____________________
   ____________________   ____________________
   ____________________   ____________________
   ____________________   ____________________

4. How many persons live in your household? What are the roles of these persons? (eg. Father of children, grandmother, father-in-law....)
5. On average, how much time do you spend with your child/children in a day? What do you usually do together (eat, play...)

________________________________________________________________________________
________________________________________________________________________________
________________________________________________________________________________

6. Are you concerned about your child’s / children’s health and nutrition? If yes, how?

________________________________________________________________________________
________________________________________________________________________________
________________________________________________________________________________

Thank you for your responses!
Background Questionnaire
for grandparents who were invited to participate in focus group discussions in a study of complementary feeding perceptions and practices.

Thank you for your participation in this complementary feeding study. Some questions on your background and family are asked in this form. The answers will only be used for this research and will not be shared to anyone else except the researchers. Please feel free to ask questions you may have about this form / the whole research.

Name: ________________________________________________________________

1. Education level (circle the option best describing your situation):
   A) less than primary school
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   D) higher secondary school (12-14 years of school)
   E) higher than high school (more than 15 years of school & higher education)

2. Number of children in family: ______________________

3. How many persons live in your household? What are the roles of these persons? (eg. Father of children, grandmother, father-in-law....)
   ________________________________________________________________
   ________________________________________________________________
   ________________________________________________________________

4. Did your children seek assistance for child care from you? What kind of assistance?
5. Did you give advice to your children about taking care of their children? What kind of advice?
________________________________________________________________________________
________________________________________________________________________________
________________________________________________________________________________

6. Are you concerned about your grandchild's / grandchildren's health and nutrition? If yes, how?
________________________________________________________________________________
________________________________________________________________________________
________________________________________________________________________________
________________________________________________________________________________

Thank you for your responses!
11.2 Focus Group Discussion topics related to the GloCal videos on complementary feeding

Target groups: Women with children between 0 - 23 months, their husbands and grandparents. Group size: 6 to 8 discussers. A written consent is asked from participants before discussion starts. Participants should fill (with assistance) also a small questionnaire before discussion. Two videos will be watched in each discussion.

1. Perceptions about susceptibility
2. Perceptions about severity
3. Perceived benefits
4. Perceived barriers
5. Cues to action

Introduction

- Thank you all very much for being here!
- Introducing the researcher (Aliisa) and other organizers: who will be taking notes and why.
- The purpose of this focus group is to discuss how children under two years of age are fed in this community (after exclusive breastfeeding). Later on we will watch four GloCal videos on complementary feeding and discuss about them. These videos have been made in Kenya and we are asking your help to make them better and suitable for this area.
- There are no right or wrong answers.
- Everything you say is confidential and the information you give is only available to the investigators. Please, do also appreciate the confidentiality of other participants. Things said here should not be discussed elsewhere.
- Feel free to ask any questions during the discussion.
- This discussion will take approximately 1 – 1,5 hour.
- Everybody has the right to share their thoughts. Please speak one at a time.
- We are tape-recording this discussion because in that way we don’t have to rely solely on our memory and your answers will be recorded correctly. The recording will be for our use only; nobody else will hear what you said here. Is it ok for you, if we record this discussion? [If somebody refuses, kindly ask to leave]
- Now let’s start by introducing ourselves. Maybe you could tell your name, how many children you have and what is the age of your youngest.
- My name is Aliisa. I am going to lead the discussion and [name] will make notes.
Complementary feeding discussion topics

1. **What food do you think should be given as first food to a baby (after breast milk)?**
   - Why this food/these foods?
   - Are there challenges when giving the first foods to a baby? How could they be managed?
   - Whose advice is good in these questions?

2. **What foods are generally given to babies younger than 2 years?**
   - Why these foods? (traditions, baby likes something, advertisements...)
   - How do you know what foods are suitable/good for your child?
   - Are there foods that are not suitable for young children?
   - Does the food given to the child change when the child grows older?
   - What if a child doesn’t like certain foods?
   - Does your child get soda, candies, cookies etc? Why/why not?
   - Are there any benefits in continuing to breastfeed a child who has started eating food?

3. **Whose advice is important to you when deciding what to feed your child? (healthcare worker, tv, grandmother, father, peers...)**
   - Is it easy to follow these advices?

4. **What is a balanced diet?**
   - Does a small child need to get
     - Fruit?
     - Vegetables?
     - Pulses
     - Meat/fish/eggs?
     - Oil/fat?
   - Do you manage to give these? Why yes/no? How often?
   - If not, how could you be able to give these foods to your child?

5. **Is it important, that a child gets a balanced diet / eats well?**
   - Why? What are the advantages?

6. **Are you worried for your child's eating and well-being?**
   - What do you worry about and why?
1. **Video: Starting complementary feeding**
1. What do you think of the video?
   - At what age do you think it is good to start complementary feeding?
   - Who decides when the baby should start eating foods?
2. 0:21 - 0:47 : What difficulties have you had when feeding the first foods to your baby?
   - How did you solve them?
3. 0:48 - 1:05 : What do you think of giving only small amounts of food to your baby at a time?
4. 1:27 - 1:33 : What do you think about giving mashed foods to your baby?
5. 1:34 : What about giving new foods regularly?
6. 1:47 : What do you think about continuing breastfeeding until 2 years of age?
7. Is there something important missing from the video or something that should be cut out from the video?

**Video: Minimum dietary diversity**

1. What do you think about the video?
   - Why does a small child need lots of nutrients / foods from different food groups?
2. 0:20 : What do you think about the animation?
   - Did you understand why calcium, protein and fat are needed?
3. 0:40 : Do you use foods from all of the food groups mentioned (grains, animal products, oil, vegetables and fruits)? Why / why not?
   - Is it important to use foods from all of the food groups? Why / why not?
   - Is it possible to use foods from all of the food groups? Why yes/no?
   - How would it be possible?
   - Should different foods be given at one meal? Why / why not?
   - Are the food and meal examples in the video something you could give to your child here?
   - Do different seasons influence, what you can feed your child?
4. 2: 26 : What do you think about giving plenty of water or sugary foods to you baby?
5. Is there something important missing from the video or something that should be cut out from the video?

**Video: Complementary food from family food**

1. What do you think of the video?
   - What do you think of giving family food to your baby?
     - Is it possible? Why / why not?
     - How could it be made possible?
2. 0: 19 : Do you take portions aside from family food for your baby? Why / why not?
3. 0: 28 : Do you add meat / milk / oil or vegetables to your baby's food? Why/why not?
4. 0: 48 : It was said in the video, that when having soups / stew foods (/ watery food), the liquid shouldn’t been given to the baby. Why do you think is that?
5. Is there something important missing from the video or something that should be cut out from the video?
**Video: Enriching porridge**

1. What do you think of the video?
2. Do you feed porridge to your child?
   - What kind of porridge?
3. 0:20 : In the video it was said, that the porridge you feed your baby should be thick, not watery. Why do you think is that?
4. 0:41 : What do you think of adding milk, oil, or other foods to the porridge?
   - Do you enrich the porridge with oil / milk / fruits...? Why / why not?
   - Why do you think the porridge should be enriched?
5. 1:22 : It was said in the video that giving lots of fruit and vegetable to the child is important. Why do you think is that?
6. Is there something important missing from the video or something that should be cut out from the video?

**Video: What about dad?**

1. What do you think of the video?
   - What do you think of giving an extra meal to the mother when she is pregnant?
   - What do you think of giving a variety of foods to the pregnant mother?
2. What do you think of participating in taking care of the newborn?
   - How have you / do you think a dad could participate in child care?
3. What do you think about learning to know the baby?
   - Is it important, that a dad spends time with the baby? Why?
4. Is there something important missing from the video or something that should be cut out from the video?

**Ending discussion**

- Is there a subject that was not covered in (all of the) videos? Would you like to know more on some subject?
- Is there something else you would like to say / ask?
- Thank you for this discussion!
11.3 Ethical Review Board Approval Letter

June 29th, 2017

Prof. Marja Mutanen
Department of Food and Environmental Sciences
University of Helsinki, Finland

Dear Prof. Marja,

Re: Approval of research protocol #SHSREC REF: 2017-049
“A Qualitative study on complementary feeding perceptions and practices using educational videos as discussion tool among families and health workers in Kirewa, Uganda”

Thank you for submitting an application for ethical review of the above - referenced research protocol. The committee reviewed it and granted approval for one (1) year, effective June 29th, 2017. Approval is valid until June 28th, 2018.

Continuing Review
In order to continue work on this study (including data analysis) beyond the expiration date, the School of Health Sciences Research and Ethics Committee must reapprove the protocol after conducting a substantive, meaningful, continuing review. This means that you must submit a continuing report form as a request for continuing review. To best avoid a lapse, you should submit the request six (6) to eight (8) weeks before the lapse date. Please use the forms supplied by our office.

Amendments
During the approval period, if you propose any change to the protocol such as its funding source, recruiting materials, or consent documents, you must seek School of Health Sciences Research and Ethics Committee approval before implementing it.

Please summarize the proposed change and the rationale for it in a letter to the School of Health Sciences Research and Ethics Committee. In addition, submit two (2) copies of an
updated version of your original protocol application - one showing all proposed changes in bold or 'track changes,' and the other without bold or track changes.

**Reporting**
Other events which must be reported promptly in writing to the School of Health Sciences Research and Ethics Committee include:
Suspension or termination of the protocol by you or the grantor
Unexpected problems involving risk to participants or others

Adverse events, including unanticipated or anticipated but severe physical harm to participants.

**Monitoring**
The School of Health Sciences Research and Ethics Committee has a duty to ensure that all research is conducted in accordance with the research governance code of practice. In order to ensure compliance, the School of Health Sciences Research and Ethics Committee undertakes random monitoring audits. If your research project is selected for monitoring audit, you will be given three (3) week's notice to prepare all documentation for inspection.

It is your responsibility to inform us in the event of early termination of the research project or if you fail to complete the research project.

**Documents approved for use along with the protocol include:**
- Informed consent form (English version)
- Translated informed consent forms (Luganda and Japadhola version)
- FGD interview guide
- Glocal videos on complementary feeding

Do not hesitate to contact us if you have any questions. Thank you for your cooperation and commitment to the protection of human participants in research.

**Final approval is to be granted by Uganda National Council for Science and Technology**

Yours sincerely,

[Signature]

Mr. Paul Kutyabami
Chairperson, School of Health Sciences Research and Ethics Committee