MAKERERE UNIVERSITY

KNOWLEDGE ATTITUDE AND PRACTICES ON INFANT AND YOUNG CHILD FEEDING AND THE ADOPTION OF THE CONTEXT SPECIFIC COMPLEMENTARY FEEDING RECIPES AMONG MOTHERS OF CHILDREN AGED 6-23 MONTHS.

A case study of Katanga slum-Kampala district

BY

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DECLARATION

I **BAMWESIGYE DIAZ** hereby declare that this dissertation is my original work and it has never been published or submitted to any institution(s) for the award of a degree.

Signature..... **Date**.....16/08/19.....

Bamwesigye Diaz

This special project has been submitted for examination and award of bachelor's degree in human nutrition of Makerere University, with my approval as the supervisor.

Signature ..... **Date**..16th/Aug/19.....

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DEDICATION

To my mother, Dativah Tumuheirwe. You're my incredible of all times, I'm very grateful for everything in my life.

To the late Mwesigwa Paddy, dad and life mentor. Rest in Peace.

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ABSTRACT

Background: Globally, 45% of all child deaths are attributed to malnutrition. Few children are exclusively breastfed and less than a fourth of children 6-23 months of age are introduced to optimal complementary feeding practices. Only 23 countries have breastfeeding rates above 60%, complementary feeding was poor with lack of correct information and practical support among most mothers. Include the aim/objective of the study

Methods: A descriptive cross-sectional study involving both qualitative and quantitative methods was used. Quantitative data collected included weight, height and MUAC and qualitative data included semi-structured questionnaires that assessed knowledge, attitude and IYCF feeding practices. Also, standard IYCF recipes designed in local languages were used to assess knowledge on IYCF and educate caretakers on IYCF practices.

Results: In pre-behavioral change nutrition education data collection, malnutrition prevalence was slightly high with 22.8% stunting, 9.2% wasting, and 11.7% underweight with male children more affected than female children. Complimentary feeding practices were suboptimal with a minimum dietary diversity of 17% and minimum meal frequency of 22.9%. Breastfeeding practices of mothers were convincing as the majority of mothers (72.1%) initiated breastfeeding within the first hour of birth. IYCF attitude was above average with more than 57.1% of mothers accepting continued IYCF practices although mother and caretakers' knowledge on IYCF and recipes was low. Behavioral change nutrition education influences the adoption of dietary diversity, nutrition knowledge, attitude and practices of mothers on infant and young child feeding practices. Majority of the mothers n=83 (59.3%) put the recipe and its recommendations into practice, and 72(86.7%) mothers were willing to continue putting the recipe and its recommendations into practice.

Conclusion: Nutrition education programs aimed at social behavioral change and improving the nutrition status of children are easily adopted by mothers and show significance.

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LIST OF ACRONYMS

UBOS	UBOS Uganda Bureau of Statistics
ICF	Inner City Fund
WHO	World Health Organization
UNICEF	United Nations Children's Emergency Fund
MoH	Ministry of Health
ANI	Accelerating Nutrition Improvement
MUAC	Mid Upper Arm Circumference
SPSS	Statistical Package of Social Sciences
WFP	World Food Program
FAO	Food and Agriculture organization
FANTA	Food and nutrition technical Assistance
USAID	United States Agency for International Development
IYCF	Infant and young child feeding
HIV	Human Immune deficiency Virus
AIDS	Acquired Immune deficiency syndrome.

CHAPTER ONE

1.1 Introduction

Uganda has made progress towards addressing malnutrition, but the prevalence of stunting among children less than 5 years (29%) (UBOS& ICF, 2017) remains higher than the World Health Organization's recommended threshold of less than 20% (WHO, 2003). Although the causes of malnutrition are multidimensional (UNICEF, 1990), poor infant and young child feeding practices play a key role among Ugandan children. Currently, only 66% of children are exclusively breastfed. Only one child in every three children starts complementary foods at six months of age. The dietary diversity and feeding frequency of Ugandan children is also low (30% and 42% respectively). Only 15% of children 6-23 months of age receive a minimum acceptable diet. Minimum acceptable diet is a composite indicator that combines feeding frequency and dietary diversity. Anemia is a public health concern with over half all children below the age of five years (55%) being anemic (UBOS, 2016)

Substantial evidence shows that maternal malnutrition during the prenatal period, or infant malnutrition during the early postnatal stage, can produce lasting damage to the structure and function of the developing body systems, resulting in deficits which manifest by early childhood (Shirley, 1991; Galler, 2017). Non-communicable diseases, child's development in different domains, morbidity and mortality risks in life have been associated with early nutrition deficits of the child's first 1000 days (WHO, 2009). Through adequate nutrition, the first two years of life, provide a critical window of opportunity for appropriate child growth and development (WHO, 2009). Growth and development is very rapid up to the second birthday of every child hence the likelihood of serious damage due to nutrient deficiencies in the first 2 years of a child's life(1,000 DAYS, 2018).Therefore, appropriate infant and young feeding practices, exclusive breastfeeding, and complementary feeding are essential for proper child's growth and development.

The government of Uganda, with support from Development Partners, has put in place strategies to address malnutrition including but not limited to food fortification of wheat flour and oil, micronutrient supplementation and deworming (MoH, 2014). While these strategies are globally accepted, there is need for affordable, locally contextualized complementary feeding recommendations which are more likely to result in long-term improvements in complementary feeding practices than generalized recommendations (WHO, 2015). Uganda did not have context specific complementary feeding recipes, until 2016.

In 2016, the Ministry of Health with support from the World Health Organization supported the country to develop the first context specific complementary feeding recipes, using Optifood-software. This was part of a larger multi-country project called the Accelerating of Nutrition Improvements in Sub-Saharan Africa (ANI, 2013). Since the closure of the project in 2016, the dissemination and use of these recipes has largely been ignored.

Several studies in Sub Saharan Africa have shown that interventions to broaden participation and stakeholder participation can change the social determinants and lead to reduced child malnutrition but there is a gap in the evidence base for urban slums. Such gaps need to be addressed because rapid changes and growth in many cities in developing countries have led to ineffective responses to the impacts of urbanization on child nutrition and to concern over high levels of child malnutrition. (WHO, 2012). Urban slums have children with high levels of malnutrition, but have largely been given no attention, with most interventions only focusing on rural areas. Therefore, this study seeks to assess the impact of the Ministry of Health' complementary feeding recipes to improve complementary feeding practices among children 6-23 months old in urban slums of Kampala.

1.2 Problem statement

Despite the global efforts to avert malnutrition, there has been minimal improvement; with 207 million children under 5 years undernourished and 41 million overweight or obese. About 45% of annual deaths among children less than 5 years of age are associated with malnutrition (WHO, 2018).

To a large extent, breast feeding recommendations have not been met by most countries worldwide. Globally, only 40% of children younger than six (6) months are breastfed exclusively (given nothing but breast milk) and only 23 countries have exclusive breastfeeding rates above 60% (WHO, 2018).In Uganda, only 60% of infants below 6 months of age are exclusively breastfed as evidenced by 7% of infants who reportedly consume plain water, 6% non-milk liquids, 8% other milk, and 11% complementary foods in addition to breast milk while 2% are not breastfed at all (UBOS & ICF, 2018), contrary to the IYCF recommendation that all children below 6 months of age must be exclusively breastfed.

The situation is worsened by poor weaning practices such as introduction of complementary feeds either earlier or later than recommended (Wamani *et al*, 2005; Ssemukasa & Kearney, 2014). To date, only 14% of children aged 6-23 months have met the criteria for a minimum acceptable diet (UBOS, 2016) with no documented urban setting evidence. Notably, 86% of the Katanga slum dwellers reportedly had children; 44% of whom; feeling unhealthy (Stoy, 2011).

Ministry of Health Uganda was supported by WHO to develop context specific food based complementary feeding recipes of the country (MoH, 2018). However, they have been applied in few areas of the country in Western and Eastern region (Bekele and Turyashemererwa, 2019). Therefore, there is a need to promote context specific complementary recipes in other areas of nutrition vulnerability such as slums, like Katanga slum area in Kampala district to improve nutrition status and dietary diversity of children aged 6-23 months in the area.

1.3 General objective

To assess knowledge, attitudes and practices of infant and young child feeding and the adoption of context specific complementary feeding recipes among mothers/ care takers of children aged 6-23 months of age.

1.4 Specific objectives

- To assess the nutritional status of children aged 6-23 months.
- To determine nutrition knowledge, attitudes and practices of mothers/ care takers of children 6-23 months of age
- To assess the dietary diversity of children aged 6-23 months in Katanga slum
- To assess the adoption of the MoH complementary feeding recipes

1.5 Hypothesis

Behavioral change nutrition education using complementary feeding recipes does not influence nutrition knowledge, attitude and IYCF practices of mothers/ care takers of children aged 6-23 months in Katanga slum.

1.6 Justification

Malnutrition in children below 5 years of age is a common problem in Kampala district.

Cultural beliefs, social and education level of mothers/ care takers and caregivers, knowledge and attitude of the mothers have been linked to be the great causes of malnutrition among the children.

Ministry of health has developed context specific complementary feeding recipes to help guide mothers/ care takers on the improvement the nutrition status of the children.

This study therefore is focused on assessing the adoption of the recipes through social behavioral change and further guide other similar studies.

CHAPTER TWO

2.0 Methodology

2.1 Study design
A cross-sectional study design was employed.

2.2 Study setting
The study was conducted in Katanga slum area, Kawempe division- Kampala District.

The area is multi-tribal with the dwellers doing small scale business such as vending and others unemployed with street children being part of the locality.

2.3 Study population
The study population will include mothers/care takers with children 6-23 months of age in Katanga slum area Kampala district.

2.4 Sample size determination
The sample size has been calculated using Cochran (1963) for calculating representative samples.

$$\text{Sample size (SS)} = \frac{Z^2 \times P(1-P)}{C^2}$$

$$\text{Sample size (SS)} = \frac{1.96^2 \times 0.405(1-0.405)}{0.005^2}$$

SS = 370 participants

Where;

SS = Sample size

Z =Value that is; 1.96 for 95% confidence interval

P = 40.5% prevalence of malnutrition among children 0-59 months in Kampala district

C = 0.05 (for 95% confidence interval)

Note: *Kampala malnutrition prevalence was taken as a sum of underweight, stunting and wasting prevalence of Kampala malnutrition statistics (UBOS, 2016).*

2.5 Participant recruitment criteria

Probability sampling was used to recruit mothers/ care takers with children 6-23 months (with the guide of the local leader) that consented and are willing to participate in the study. The area leadership tour guide helped in identifying all mothers/ care takers with children 6-23 months of age in the area and any mother reached upon was asked for their consent. On deliberate acceptance, mothers/ care takers were taken upon and interviewed.

2.6 Data collection method

Semi structured interviews was used to collect qualitative data.

Nutrition assessment was done through anthropometry.

2.7 Data collection tools

Semi structured questionnaires were used to collect qualitative data from 140 households.

MUAC tapes was used to measure mid upper arm circumference.

Length board and a weighing scale were used to measure length and weight respectively.

2.8 Data cleaning and analysis

SPSS, WHO Anthro and Excel statistical packages were used for data entry, cleaning and analysis.

CHAPTER 3

3.0 Literature review

3.1 Malnutrition in children

Malnutrition refers to deficiencies, excesses or imbalances in a person's intake of energy and/or nutrients (WHO, 2018). It can be caused by various factors classified as Immediate causes which include diseases, inadequate dietary intake, underlying causes that is food insecurity at house hold levels, inadequate care, insufficient health services and unhealthy environment and basic causes which are inadequate education, political and economic factors. (Adamu *et al.*, 2016), however, poverty, inequality and poor diets remain major causes (WFP, 2018).Malnutrition in children occurs mostly during the first two years of life, it can be acute or chronic. Chronic malnutrition is virtually irreversible and can start during pregnancy or even after birth. Its causes range from poor breast feeding and complementary feeding practices, infections to poor maternal nutrition. Shirley (1991) illustrates that maternal malnutrition during the prenatal period, or infant malnutrition during the early postnatal stage, can result into lasting damage to the structure and function of the developing body systems, resulting in deficits which become manifest by early childhood.

Nutrition status of a child is assessed through anthropometric approach by measuring different parameters such as weight, height, MUAC, skinfold; biochemical by analyzing the body nutrient profile, clinical examination through analyzing any visible sign malnutrition and through dietary approach by assessing the dietary intake (Hartman & Shamir, 2009). WHO classifies malnutrition as either under nutrition which is sub categorized as stunting (low height for age), wasting (low weight for height), underweight (low weight for age), micronutrient deficiencies or insufficiencies (a lack of important vitamins and minerals), and over nutrition which includes obesity, diabetes, cancer and cardiovascular disorders that contribute to child's development in different domains, morbidity and mortality risks in life (WHO, 2009).

Children who are malnourished do not reach their optimal sizes in adulthood stage, their cognitive functioning is impaired thus their education competency is low, they have a low immunity and are prone to infections, the risk of mortality and morbidity is high. Malnutrition also hinders the social and economic productivity (The Mother and Child Health and Education Trust, 2017).

3.2 Global overview of malnutrition

Globally, malnutrition rates remain alarming with 150.8 million (22.2%) children under five years of age are estimated to be stunted and 51 million (7.5%) children under five years of age wasted, 38.3 million (5.6%) children under five years of age are overweight (UNICEF, WHO, & The World Bank, 2018). Anemic children were 20%, 250 million preschool children are considered to be vitamin A deficient and anemia contributes to 20% of all maternal deaths globally whereas 38 million babies are born with iodine deficiency (FAO, 2017).

3.3 Malnutrition in Uganda

Nutrition in Uganda is still a national challenge despite the efforts by ministry of health and the different programs to narrow down malnutrition. Stunting levels in children under five years of age were 29%, 11% are wasted and 5% are overweight (UBOS, 2016). Stunting is high in males (31%) than in females (27%). About 4 in 10 children born to mothers/ care takers with no education (37 percent) are stunted compared with 1 in 10 (10 percent) of children born to mothers with more than a secondary education. 82.6% of children 0-1 months are not exclusively breast fed and 78.8% of the children are not initiated to complementary feeding at 6 months of age, 43.3% urban malnutrition, 43% infant and 23% child mortality rates (UBOS, 2016). Malnutrition in women of child bearing age was 17% (FANTA, 2010).

Poverty, food insecurity and ignorance are the major causes of malnutrition (USAID, 2018). Understanding that child malnutrition, hunger and knowledge are directly associated with inappropriate feeding practices, this calls for a shift from food based approaches towards feeding behavior change interventions.

3.4 Overview of IYCF

WHO (2018) reveals that 45% of all child deaths globally are attributed to malnutrition. Few children are exclusively breastfed and less than a fourth of children 6-23 months of age are introduced to optimal complementary feeding practices. Child malnutrition has life-long consequences that impair child development and the country's prosperity (Cusick & Georgieff, 2016).

IYCF has received increasing attention over the past 25 years. The WHO and UNICEF joint global strategy (WHO, 2003) has significantly fostered appropriate practices of young and infant child feeding in mothers and caregivers.

In Uganda, IYCF has been well addressed in policy which has been divided into;

i. Feeding the Infant/Young Child under normal Circumstances.

ii. Feeding the Infant/Young Child Exposed to HIV/AIDS.

iii. Feeding the Infant/Young Child in other Exceptionally Difficult Circumstances. (MoH, 2012)

To assess effectiveness of IYCF feeding practices, several indicators were developed. These include: Core indicators such as early initiation of breastfeeding, exclusive breastfeeding under 6 months, continued breastfeeding at 1 year, introduction of solid, semi-solid, or soft foods, minimum dietary diversity, minimum meal frequency, minimum acceptable diet, consumption of iron-rich or iron-fortified foods and Optional indicators such as children ever breastfed, continued breastfeeding at 2 years, age-appropriate breastfeeding, predominant breastfeeding under 6 months, duration of breastfeeding, bottle-feeding, milk feeding frequency for non-breastfed children (Daelmans *et al*., 2009).

The minimum acceptable diet indicator is used to assess the proportion of children age 6-23 months who meet minimum standards with respect to IYCF practices. Children age 6-23 months who have a minimum acceptable diet meet all three IYCF criteria below:

i. Breastfeeding, or not breastfeeding and receiving two or more feedings of commercial infant formula; fresh, tinned, or powdered animal milk; or yoghurt

ii. Fed with foods from four or more of the following groups: a. infant formula, milk other than breast milk or other milk products; b. foods made from grains, roots, and tubers, including porridge and baby food from grains; c. vitamin A-rich fruits and vegetables; d. other fruits and vegetables.

iii. Fed the minimum recommended number of times per day according to their age and breastfeeding status:

a. For breastfed children, minimum meal frequency is receiving solid or semisolid food at least twice a day for infants aged 6-8 months and at least three times a day for children age 9-23 months

b. For children age 6-23 months who are not breast fed, minimum meal frequency is receiving solid or semisolid food or milk feeds at least four times a day. (UBOS, 2016)

3.5 Breastfeeding

Breast feeding is the gold standard for providing young infants with the adequate nutrient requirements (Haider *et al*., 2003Exclusive breastfeeding (giving nothing but breast milk) is recommended up to 6 months of age with continued breast feeding along suitable complementary feeding up to the second birth day of any child to achieve their optimal growth (WHO, 2013; Kramer & Kakuma, 2012) unless contraindicated. The benefits range from strong immunity, good cognitive performance, reduced mortality and morbidity risks to a proper physical posture (Chessa & Randall, 2012; Hoddinott *et al*., 2008). How good a mother, a woman is, is decided by breastfeeding practices thus breastfeeding is a reflection of good mothering (Stearns, 2009)

Out of the 194 evaluated nations, the global breast feeding scorecard found that only 40 per cent of children younger than six months are breastfed exclusively and only 23 countries have exclusive breastfeeding rates above 60 per cent. Nearly 70 per cent of countries in Africa have high rates of continued breastfeeding at one year, but in the Americas, only four countries have such high rates. However, at two years of age, the rates of continued breastfeeding drop off dramatically to 45 per cent (UNICEF& WHO, 2017). Sinhababu *et al.* (2010) reports 1.4 million global deaths cases of children less than five years of age due to sub optimal breast feeding.

In Uganda, only 66% of children under the age of 6 months are exclusively breastfed, while two per cent are not breastfed at all. In addition, the percentage of children exclusively breastfed decreases sharply with age from 83% of infants age 0-1 month to 69% of infants of age 2-3 months and, further, to 43% of infants of age 4-5 months. Children 6-23 months of age were not breastfed at all were 49.3%, 8.6% of children 6-23months of age were exclusively breastfed. More so, 80% of children 6-9 months of age were breastfeeding and consuming complementary foods, 64.8% 12-23 months of age were breastfed and consumed complementary food (UBOS, 2017).

The reinforcement of breastfeeding has been strongly affected by social and economic status, maternal employment, maternal attitude and knowledge (Haider *et al*., 2003; Kodish *et al.*, 2015; Gebrian, 2014). In a study of evaluation of feeding practices and to avert their barriers, (Fahmina *et al.*, 2014) significant changes in exclusive breastfeeding and complementary feeding practices were observed with behavioral change interventions in communities of nutrition concerns.

3.6 Complimentary feeding

Optimal complementary feeding was identified as a priority action to prevent childhood malnutrition by the Haitian Nutrition Policy which analyzed data from the Haiti Demographic Health Survey using the World Health Organization 2008 infant and young child feeding indicators to describe feeding practices among children aged 6–23 months; 29.2% of the children aged 6-23 months had minimum dietary diversity, 45.3% had minimum meal frequency and 17.1% experienced minimum acceptable diet (Heidkamp *et al*., 2015).

A case control study in Central Sulawesi province- Indonesia (Hijra *et al.,* 2016) found out that inappropriate complementary feeding increased the risk of stunting in children of 12-24 months of age by 8.26%. Similarly, the percentage of mothers who practiced optimal complementary feeding was 40.5% with low timely complementary feeding (56.4%), appropriate meal frequency (60.6%) and dietary diversity of 40.5% in a community-based cross-sectional study in North-West Ethiopia (Gessese *et al.*, 2014).

In Uganda, a descriptive survey (Ssemukasa & Kearney, 2014) that evaluated infant weaning practices at Nsanji health center III, Wakiso district (n=250) revealed 22% of mothers introducing solid foods before 1 month, 14% at 1-3 months and 6% at 4-6 months. Complimentary feeding was introduced earlier than recommended. 21% of children aged 2-3 months received complementary food instead of breast milk and 19% of children aged 6-8 months were exclusively breast fed instead of complementary feeding whereas 42% and 49% of children above 12 months were complemented twice and 3-4 times respectively in a cross-sectional study conducted in Hoima district in Western Uganda (n=720) (Wamani *et al.*, 2005).

The inappropriate complementary feeding practices were attributed to cultural beliefs, social and education level of mothers and caregivers, knowledge and attitude of the mothers (Nankumbi & Muliira, 2015; Dewey & Adu-Afarwuah, 2008; Tang Li *et al.*, 2015; Tariku *et al.*, 2015; MQSN, 2015; Mavenjina & Stella, 2014)

However, there was convincing evidence that complimentary feeding behavioral change interventions in children aged 6-23 months improved their feeding practices and growth in 29 studies conducted in developing countries (Cecilia *et al.*, 2014; Fahmina *et al.*, 2014).

3.7 Nutrition education

Nutrition education has long been recognized as strong enhancer of feeding practice behavioral changes and a booster of IYCF indicators. In food insecure areas, participatory community based nutrition education for care givers improved dietary diversity of children 6-23 months of

age (Kuchenbecker *et al.*, 2017). Mothers and caregivers have shown strong motivation to adopt IYCF practices through nutrition education interventions that focus child's health benefits (Chiutsi-Phiri *et al.,* 2017; Mulualem *et al.,* 2016).

Post nutrition education program studies have revealed that nutrition education programs have a positive impact on IYCF indicators in the intervention groups in Kenya and Western Uganda (Ickles *et al*., 2017; Mutiso *et al*., 2018).

Uganda

Malnutrition among children occurs almost entirely during the first two years of life and is virtually irreversible after that. Food interventions at schools are unlikely to address infant feeding and young child malnutrition as they cater for older children.

The solutions to the problem emerge from a clearer distinction between hunger and malnutrition and the knowledge that child malnutrition is directly associated with inappropriate feeding practices. This requires a shift in thinking, from food-based approaches towards feeding behavior change (Gupta & Rohde, 2004)

Lack of correct information and practical support can be reversed by providing individualized counseling and community based nutrition education (UNICEF, 2017). Area specific programs were recommended for providing comprehensive nutrition and health education for mothers, to protect, promote and sustain the optimal IYCF practices in IYCF practices cross sectional study in Guntur district, India. (Swapna & Kalyan, 2015)

CHAPTER 4

4.0 Results

4.1 Social demographic characteristic

Amongst the respondents in the survey, 7.9% (n=11) were <19 years, those aged 20-30 years were 65% (n=91) while those aged 30-35 years were 19.3% (n=27), 32.1% (n=45) had had no formal education, 6.4% (n=9) of the respondents attained education up to primary level whereas 25.7% (n=36) never completed primary, 28.6% (n=40) had attained secondary education. Majority were married and depended on their husbands for home finances.

Table 1: Social demographic results.

Variable	Frequency (n)	Percent (%)
Age of the respondents		
<19 years	11	7.9
20-30 years	91	65.0
30-35 years	27	19.3
> 35 years	11	7.9
Occupation of respondents		
Casual worker	51	36.4
House wife	56	40.0
Office job	6	4.3
Self-employment	25	17.9
Agriculture/Farmer	2	1.4
Level of education of respondents		
No formal education	45	32.1
Not completed primary	36	25.7
Completed primary	9	6.4
Secondary education	40	28.6

Diploma level education	7	5.0
Certificate level training	3	2.1
Marital status of mother		
Single	10	7.1
Married	99	70.7
Widowed	4	2.9
Separated	17	12.1
Single parent	10	7.1
Number of children owned by the mother		
1-3 children	101	72.1
4-6 children	34	24.3
7-8 children	5	3.6

4.2 Nutrition status of children aged 6-23 months in Katanga slum Kampala district.

Children who were wasted were 17% whereby 6.6% were severely wasted. Stunting levels were 38.9%, the proportion of children severely stunted was 10.7% and 19.5% of the children were underweight with 8.5% severely underweight.

Children 12-23 months of age were the most affected by wasting (13%), stunting (41.7%) and underweight (20.5%) than children 6-11 months with wasting levels were 10.6%, stunting (7.9%) and underweight (7.5%). Males were more affected by malnutrition with wasting of 34%, stunting 37.7% and underweight 39.9% than females whose nutrition status was, wasting 10.8%, stunting 49.8% and underweight 15% as shown in the figures below

Table 2. The nutrition status of children aged between 6-23 months in Katanga slum, Kampala district.

		Percentage of children 6-23 months classified as malnourished according to three anthropometric indices of nutritional status: height-for-age, weight-for-height, weight-for-age an MUAC							
		Weight-for-length (Wasting)		**length-for-age (stunting)**		**Weight-for-age (Underweight)**		**MUAC for age**	
Sex	Age categories	Percent-age below -3 SD	Percent-age below -2 SD	Percent-age below -3 SD	Percent-age below -2 SD	Percent-age below -3 SD	Percent-age below -2 SD	Percent-age below -3 SD	Percent-age below -2 SD
Male	6-11	9.5	9.5	0	9.5	4.8	9.5	0	4.5
	12-23	2.5	12.5	4.7	34.9	7	18.6	0	0
Female	6-11	0	0	0	5.9	0	0	0	0
	12-23	0	10.8	17.1	26.8	5	10	0	0
Combined	6-11	5.3	5.3	0	7.9	2.5	5	0	2.4
	12-23	1.3	11.7	10.7	31	6	14.5	0	0

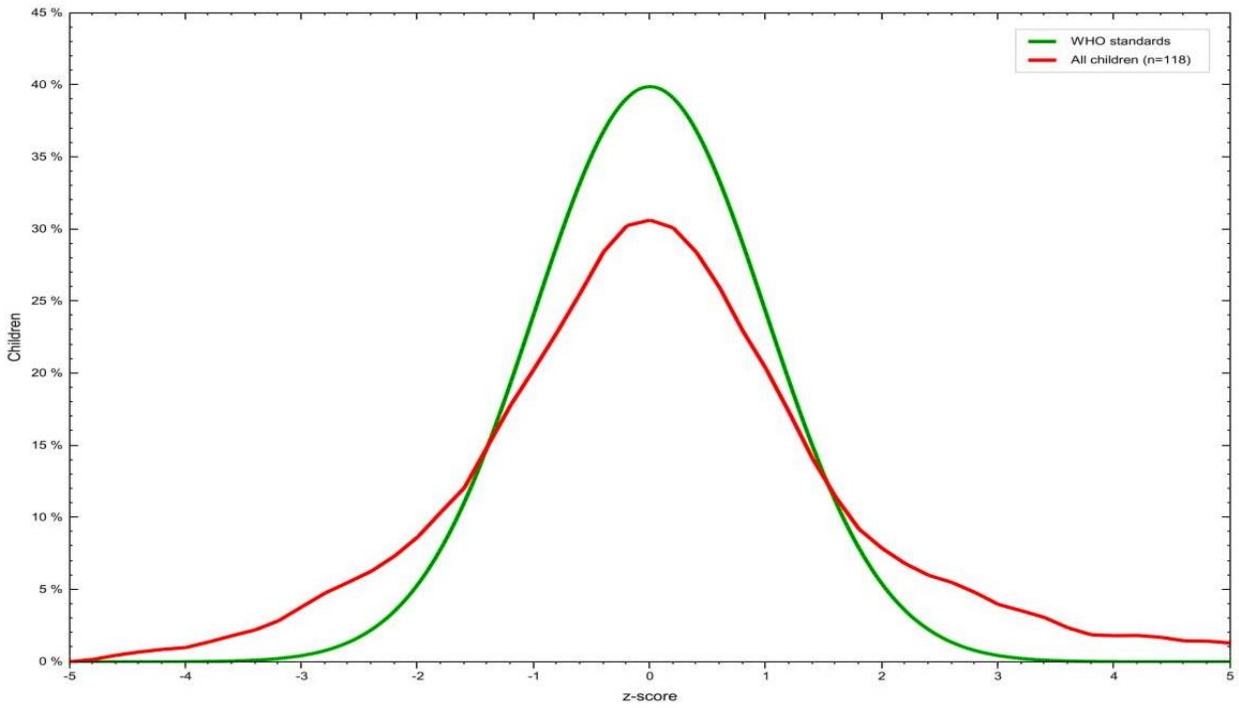

Figure 1: Weight for length Z-Score

4.3 Food source.

Majority of the respondents (67%) obtained their food from the market, 30% from the shop and 3% produced food on their own.

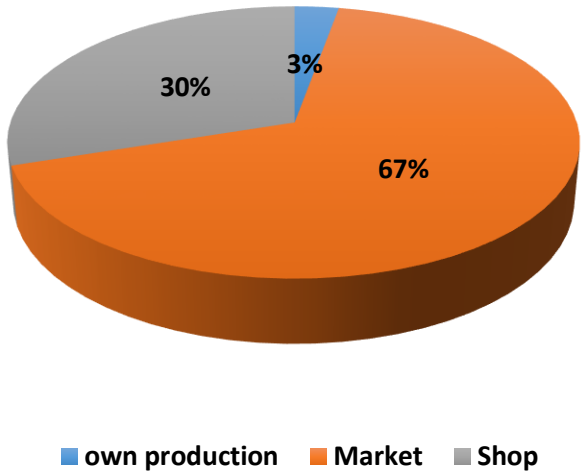

Figure 2: Food source of mothers/ care takers

4.4 Antenatal attendance

Most of the respondents 31.4 %(n=44) attended antenatal more than 5 times, 10.7(n=15) reported to have never attended antenatal and the rest attended less than 5 times.

Table 3. Antenatal attendance by the respondents

Number of times of antenatal attendance	Frequency (n)	Percent (%)
Once	8	5.7
2-3 times	30	21.4
4 times	43	30.7
>5 times	44	31.4
Did not attend	15	10.7
Total	140	100.0

4.5 Infant and young child feeding practices

This was assessed through the IYCF indicators.

They include; Early initiation of breastfeeding, introduction of solid, semi-solid, or soft foods, minimum dietary diversity, minimum meal frequency, minimum acceptable diet, children ever breastfed, continued breastfeeding at 2 years duration of breastfeeding, bottle-feeding, and milk feeding frequency for non-breastfed children.

Breastfeeding initiation was generally good as most mothers/ care takers, 72.1 %(n=101) reported to have initiated breastfeeding within the first hour after birth, 1.4% (2) never breastfed and 7.1% (10) only initiated breastfeeding after 7 hours and beyond.

Table 4. Breast feeding initiation history

Variable		Frequency (n)	Percent (%)
	Never breastfed the child	2	1.4
	Initiated breastfeeding within the first hour	101	72.1
	Initiated breastfeeding within 2-6 hours	22	15.7
	Initiated breastfeeding within 7-42 hours	10	7.1
	Initiated breastfeeding within 25 hours and above	5	3.5
Total		140	100.0

The respondents were assessed on whether they ever used bottles for feeding their children and 98(70%) respondents reported to have never used bottles as a feeding option, 42(30%) respondents said they had ever used bottles for feeding their children while the rest declined to give a response on bottle feeding.

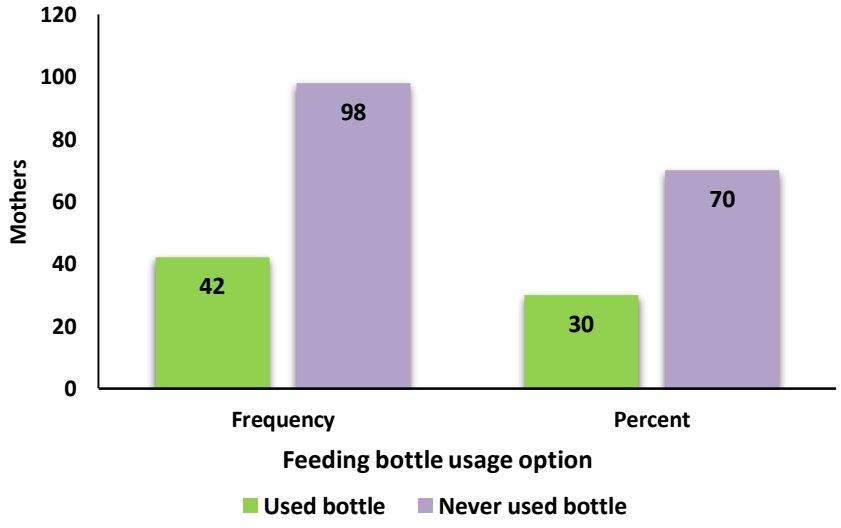

Figure 3: The use of bottles to feed the child

Breastfeeding practice was below average on assessment of the 24 breastfeeding history. Only 33.6% n=47) of the respondents had breastfed their children 1-5 times in the last 24 hours before the study was conducted, 28.6 %(40) reported to had breastfed their children 6 and above times while majority of the respondents, 33.7% (n=59) never breastfed their children for the last 24 hours before the study was conducted.

Diary consumption patterns of the children were generally poor as most the children 57.8 %(81) never consumed milk in the last 24 hours prior to the study and only 42.1% (n=59) consumed milk at least once in the last 24 hours prior to the study. Most mothers/ care takers 96.4% (135) amongst the respondents who were asked about introduction of solid foods to the children admitted they had already introduced solid foods to their children by the time of study was conducted and only 5 respondents had not yet introduced solid foods to their children.

Age based introduction of solid foods was averagely good as 67.1% (n=94) of the respondents reported they introduced solid foods between the age of 6-8 months, 42 respondents (30%) introduced solid foods at an earlier age below 6 months, the recommended age of solid food introduction and the rest of the respondents introduced solid foods above 8 months of age.

Table 5. Child feeding practices

Variable	Frequency(n)	Percent (%)
Children breastfed the previous 24 hours		
Not breastfed at all	59	33.7
Breastfed 1-5 times in the last 24 hours	47	33.6
Breast fed 6 and above times in the last 24 hours	40	28.6
Number of times of milk consumption in the previous 24 hours		
No milk at all	81	57.8
Took cow's milk 1-5 times in the last 24 hours	56	40.0

Took cow's milk 6 times and above in the last 24 hours	3	2.1
Mothers/ care takers responses on the introduction of solid foods		
YES	135	96.4
NO	5	3.8
Mothers/ care takers responses on the age of solid food introduction children		
< 1 month	8	5.7
2-5 months	34	24.3
6-8 months	94	67.1
9-11 months	3	2.1
12 months and above	3	2.1

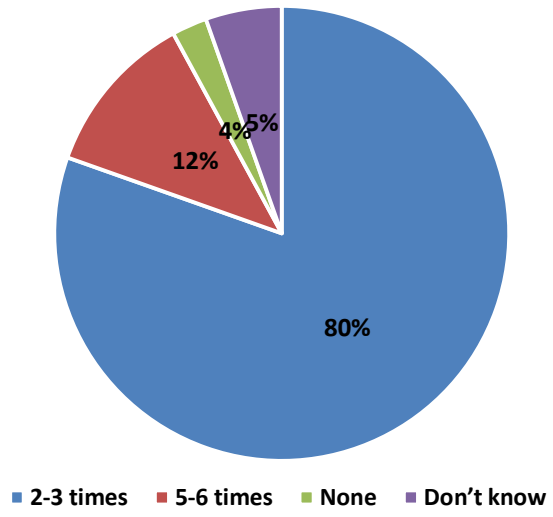

Figure 4: The child's meal frequency for the last 24 hours

4.6 Dietary diversity score

The dietary diversity score was generally poor at 17.8%, with 82.1% not meeting the recommended dietary diversity.

According to WHO measurement guidelines (WHO, 2010) children who have consumed at

least 4 of the 7 possible food groups over a 24-hour recall period are classified as having minimally adequate diet diversity.

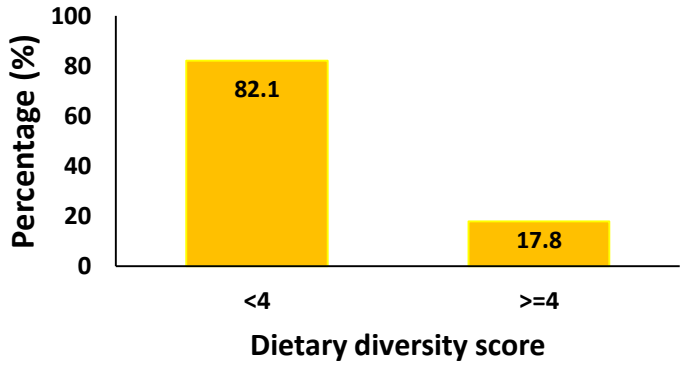

Figure 5: Diet diversity score

The minimum dietary diversity and the minimum meal frequency of the children in the study was generally poor at 17.8% and 22.9% respectively.

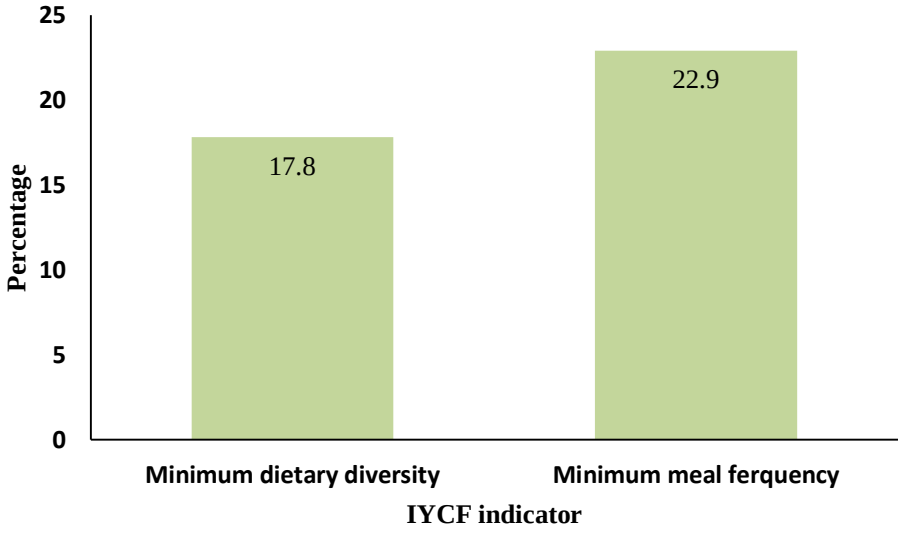

Figure 6. IYCF indicators

4.7 Food groups consumed

The mostly consumed food groups were tubers and plantains (69.3%) followed by cereals (63.6%) and other vegetables groups (12.1%) in the previous 24hours as shown below.

Table 6. Percentage consumption of foods from each food group

FOOD GROUP	EXAMPLES	FREQUENCY (n)	PERCENTAGE (%)
CEREALS	Porridge, bread, rice, millet, maize, noodles, or other foods made from grains	89	63.6
PLANTAIN AND TUBERS	Matooke, plantains, Irish potatoes, white sweet potatoes, white yams, cassava, or any other foods made from roots	97	69.3
DARK GREEN VEGETABLES	Any dark green leafy vegetables	31	22.1
OTHER VEGETABLES	Pumpkin, carrots, or sweet potatoes that are orange inside	17	12.1
FRUITS	Ripe mangoes, ripe papayas, or any other vitamin A rich fruits	26	18.6
MEAT	Any meat, such as beef, pork, lamb, goat, chicken, or duck	25	17.9
EGGS	Eggs	20	14.3
FISH	Fresh or dried fish, fish powder	45	32.1
PULSES	Any foods made from beans, peas, lentils, nuts, or seeds	65	46.4
DIARY	Cheese, yogurt, or other milk products	25	17.9
FATS	Any other oil, fats, or butter, or foods made with any of these	40	28.6

4.8 Weekly food frequency.

The weekly frequency of the foods from each group was very low as most of foods were consumed once in a week as shown below. Cow's milk was the most frequently consumed with a weekly frequency of 48 for more than 7 times, followed by matooke with a frequency of 32 for more than 7 times a week, with orange sweet potatoes being the least consumed with anon consumption frequency of 117 a week.

Table 7. Food frequency of children

Food	*Frequency*								
	None	Once	Twice	Thrice	4 times	5 times	6 times	7 times	>7 times
Cow's milk	31	6	13	9	10	3	3	15	48
Other milk	115	4	1	6	3	1	2	1	6
Eggs	45	13	27	23	7	2	2	10	10
Chicken	65	24	23	13	2	1	1	2	7
Rice	72	15	14	8	1	2	3	3	20
Mukene	47	17	24	17	10	3	1	3	17
Other fish	74	25	18	7	7	3	1	1	3
Millet porridge	65	16	16	7	12	2	3	5	13
Other millet preparation	107	4	8	6	2	2	1	3	6
Whole grain maize	91	8	10	9	6	2	3	5	5
Other maize	68	10	15	16	3	4	3	6	15
Matooke	24	12	23	12	7	1	3	25	32
Cassava	83	15	6	8	2	2	3	7	13
Bread	53	14	12	7	3	2	1	20	26
Chapatti	68	9	15	11	4	4	5	11	12

Beans	27	9	21	20	13	3	9	17	20
Groundnuts	31	16	27	17	14	3	3	11	16
Soy flour	89	11	5	5	9	1	3	8	8
Orange sweet potato	117	11	3	3	1	0	1	1	3
White sweet potato	91	19	13	7	1	3	1	1	3
Yellow sweet potato	108	10	10	7	1	1	1	1	2
Irish potato	53	15	16	16	10	6	1	8	12
Green leafy vegetable	71	19	13	8	4	3	1	12	8

4.9 IYCF knowledge and attitude

The respondents' knowledge was average with 84.3% of respondents saying complementary feeding should start at 6 months, 63.6% admitting that core reason for complementary feeding at 6 months of age is because breast milk. 67.1% of them received their complementary feeding information from health facilities.

Table 8. Knowledge of respondents on IYCF practices

Variable	Frequency (n)	Percent (%)
Age at which babies should start eating foods in addition to breast milk		
At 6 months	118	84.3
Other	15	10.7
Don't know	7	5.0
Importance of giving foods in addition to breast milk to babies from the age of six months		
Breast milk is not sufficient	89	63.6
Don't know	46	32.8
Others	5	3.6
Response to thickness of porridge that should be given to babies.		
Thick porridge	53	37.9
Watery porridge	79	56.4
Does not know	8	5.7

Reason for choosing the porridge.		
Because first porridge is thicker than watery one	44	31.4
Because thick porridge is more nutritious	40	28.6
Watery porridge is easy to drink in cup	56	40.0
Dietary diversity and ways of enriching porridge		
cooking oil	8	5.7
Blue band	40	28.6
Sunflower seed, peanuts, soybean	40	28.6
Don’t know	48	34.3
Ways of encouraging the child to eat.		
Clap hands	11	7.9
Make funny faces/play/laugh	14	10.0
Demonstrate opening your own mouth very wide/modeling how to eat	10	7.1
Say encouraging words	5	3.6
Draw the child's attention	54	38.6
Others	21	15.0
Don't know	23	16.4
Source of information about child feeding		
Health center	94	67.1
VHTs	9	6.4

Mother in law	5	3.6
Grandmother	4	2.9
Other family members	2	1.4
Friends/neighbors	2	1.4
Community gathering	4	2.9
Radio/TV	5	3.6

Mothers/ care takers' attitudes towards IYCF practices were averagely good as 83(59.3%) of mothers/ care takers were confident in practicing IYCF, 97(69.7%) had no difficulty in feeding their children different foods, 80(57.1%) felt good feeding their children on several foods several times a day.

Table 9. Attitude of respondents on IYCF practices

Variable	Frequency (n)	Percentage (%)
Confidence of mothers/ care takers in preparing food for their children.		
Not confident	14	10.0
Confident	83	59.3
Very confident	43	30.7
Goodness of giving different types of food to the child each day.		
Not good	23	16.4
Not sure	6	4.3
Good	111	79.3
Difficulty in giving different types of food to the child.		
Not difficult	97	69.3

Very difficult	14	10.0
Difficult	29	20.7
Goodness in feeding the child several times each day.		
Not good	56	40.0
Not sure	4	2.9
Good	80	57.1
Difficulty in feeding the child several times each day		
Not difficult	95	67.9
Very difficult	11	7.9
Difficult	31	22.1
Reason for difficulty in feeding the child several times.		
Hard to keep food warm	11	7.9
Child has to feed the same meals as rest of family members	14	10.0
Child refuses the food	15	10.7
Goodness to continue breastfeeding beyond six months		
Good	129	92.1
Not good	5	3.6
Not sure	6	4.3
Difficulty in continuing to breastfeeding beyond six months		
Not difficult	124	88.6
Very difficult	4	2.8
Difficult	12	8.6

Mothers/ care takers were trained on how to use the recipes introduced and after, information as below was obtained from them.

Table 10. Information about recipes

Variable	Frequency	Percent
Whether mothers/ care takers have ever heard about the recommended feeding practices or foods before		
Yes	50	35.7
No	90	64.3
Whether food in the recipe is normally fed to small children (6-23months) in this community		
Yes	26	18.6
No	114	81.4
Recommended foods can families access here in the community		
Yes	86	61.4
No	54	38.6
Effect of season on access to foods recommended in recipe.		
All food	120	44.3
Not all	20	14.3
What families would need to be able to put these recipes into practice		
Financial support	69	49.3
Educating mothers/ care takers on recipes	66	47.1

	Time	5	3.6

4.01 Statistical associations

Association between source of feeding information and child breastfeeding

The relationship between the source where mothers/ care takers obtained information and the children ever breastfed was statistically not significant (p=0.490). Majority of the mothers/ care takers (n=85) who breastfed their children, however, got their information from health center.

Table 11. Relationship between source of information and children who were breastfed.

		Has the child ever been breastfed			P value
			Yes	No	
Where feeding information is obtained		1	14	0	0.490
	Health center	6	85	1	
	VHTs	1	7	0	
	Mother in law	0	4	2	
	Grandmother	0	4	0	
	Other family members	0	2	0	
	Friends/neighbors	0	2	0	
	Community gathering	0	4	0	
	Radio/TV	1	4	0	
Total		9	126	3	

4.02 Results of promoting context specific complementary feeding recipes.

The survey had a significant effect as most mothers/ care takers n=83 (59.3%) were able to put the recipe into practice, 8 (9.6%) respondents had practiced the recipe the day of visit, majority 37(44.6%) had put the recommendations of the recipe into practice a week ago while only 2 respondents had put the recipe into practice more than the last two weeks.

Mothers/ care takers' willingness to continue practicing the recipe was very good with 86.7% of them willing to continue and only 13.3% of the mothers/ care takers not willing to continue practicing the recipe

Table 12. Information about adoption of complementary feeding recipes.

Mothers/ care takers who put the recipe into practice over the last month since our last visit	Frequency (n)	Percent (%)
Yes	83	59.3
No	57	40.7
Last time the recipe was practiced		
Today	08	9.6
Yesterday	13	15.7
A week ago	37	44.6
2 weeks a go	23	27.7
> 2 weeks ago	02	2.4
Never	0	0
How the recipe was you prepared		
Followed whole recipe correctly	54	65
Only considered recipe foods	21	25.3

Considered recommended frequency	6	7.2
Did not follow recipe at all	2	2.4
Mothers/ care takers who made changes in the recipe.		
Yes	29	
No	54	
What changes were made in the recipe		
the recommended frequency	18	62.1
food, serving size	8	27.6
Preparation	3	3.6
Mothers/ care takers willingness to continue putting the recipe into practice this way		
Yes	72	86.7
No	11	13.3
Belief that that the child liked the food		
Yes	51	61.4
No	25	30.1
Not sure	7	8.4
Mothers/ care takers who needed permission or help from someone else to put the recipe into practice		

Yes	17	20.5
No	66	79.5
Barriers to mother's ability to put the recipe into practice.		
Time	37	64.9
Money	18	31.6
Season	2	3.5
If there is any changes in normal food spending caused by putting the recipe into practice.		
Yes	119	85
No	14	10
Don't know	7	5

CHAPTER 5

5.0 Discussion

5.1 Socio-economic characteristics

Levels of literacy were very low, as the majority of mothers/ care takers had no formal education, 32.1% (n=45), only 28.6 % (n=40) had attained secondary education. Literacy levels have strongly been correlated with IYCF practices and malnutrition in children, as it can be shown by suboptimal feeding practices of 17% minimum dietary diversity and 22.9% minimum meal frequency and high malnutrition prevalence of 9.2% wasting and 22.8% stunting by the findings. A national study (UBOS, 2016) found out that about 4 in 10 children born to mothers/ care takers with no education (37 percent) are stunted compared with 1 in 10 (10 percent) of children born to mothers/ care takers with more than a secondary education. 78.8% of the children are not initiated to complementary feeding at 6 months of age.

About 40% of the mothers/ care takers were dependent on their husbands for economic well-being and 36.4% were just casual workers. The poor economic status of the participants is similar to the global scope as poverty and ignorance have been attributed to, to be the leading causes of malnutrition (USAID, 2018) since economic has been associated with reinforcement of infant and young child feeding practices (Haider *et al*., 2003; Kodish *et a.l,* 2015; Gebrian, 2014).

5.2 Nutrition status

Malnutrition levels in Katanga were higher compared to the global malnutrition with wasting 7.5% and stunting 21.9% (UNICEF, 2018). 9.2% children were wasted whereby 2.5% were severely wasted. Stunting levels were 22.8%, the proportion of children severely stunted was 7.1% and 11.7% of the children were underweight with 5.5% severe underweight.

Children 12-23 months of age were the most affected by wasting (11.7%), stunting (31%) and underweight (14.5%) than children aged 6-11 months whose wasting levels were 5.3%, stunting (7.9%) and underweight (5%). Males were more malnourished; wasting (11.3%), stunting (25.8%) and underweight (16.7%) than females whose nutrition status was; wasting (7%), stunting (19.7%) and underweight (6.5%). Malnutrition levels in this area are comparably lower than the national findings (UBOS, 2016) which report 29% of children under five years of age being stunted and 11% wasted with stunting being high in males (31%) than in females (27%).

Elevated malnutrition levels could be due to education levels of mothers/ care takers, the economic status and confounding factors such as hygiene and sanitation in the area.

5.3 IYCF practices

Breastfeeding practices of mothers/ care takers were convincing as the majority of mothers/ care takers (72.1%) initiated breastfeeding within the first hour of birth, 70% never bottle fed their children and the proportion of those currently breastfeeding was 64%. The fair practice of breastfeeding could be due the positive attitude of mothers/ care takers towards breastfeeding and continued breastfeeding as 92.1% of the mothers/ care takers believed it was good to continue breastfeeding beyond six months and 88.6% said they had no difficulty with continued breastfeeding. The results are comparative with the (UNICEF & WHO, 2017) global scorecard where nearly 70% of African countries had high rates of continued breastfeeding at one year and the (UBOS, 2016) report that indicated 50.7% of children 6-23 months being breastfed.

However, considering the 24 hour recall, most children had not been breastfed, 33.7 %(n=59) and 33.6% (n=47) had been breastfed less than 5 times whereas those that did not have milk feeding were 57.8%. The poor breast feeding practices could be attributed to social and economic status of the mothers/ care takers since 36.4% of the mothers/ care takers were casual workers who met busy schedules. This is more explained by (Haider *et a.l,* 2003; Kodish *et al*., 2015; Gebrian, 2014) who reports social and economic status, maternal employment as the strong barriers affecting reinforcement of breastfeeding.

Complementary feeding was introduced earlier than recommended as 5.7% of mothers/ care takers introduced solid foods before 1 month, 24.3% at 2-5 months, 67.1 at 6-8 months and 4.2% at 9-23 months. 80% of children were complimented 2-3 times a day and only 12% were complimented 5-6 times in a day. The results are similar to a descriptive survey (Ssemukasa & Kearney, 2014) at Nsanji health center III, Wakiso district (n =250) which revealed that 22% of mothers/ care takers introduce solid foods before 1 month, 14% at 1-3 months and 6% at 4-6 months and a cross-sectional study conducted in Hoima district in Western Uganda (n=720) (Wamani *et al.,* 2005) which revealed that complimentary feeding was introduced earlier than recommended.

Complimentary feeding was suboptimal with a minimum dietary diversity of 17% and minimum meal frequency of 22.9% in comparison with WHO measurement guidelines (WHO, 2010) which

recommend that children who have consumed at least 4 of the 7 possible food groups over a 24-hour recall period are classified as having minimally adequate diet diversity.

The results are similar to those of Haiti Demographic Health Survey that reported 29.2% of the children aged 6-23 months having minimum dietary diversity, 45.3% having minimum meal frequency and 17.1% experiencing minimum acceptable diet (Heidkamp *et al*., 2015) and to a case control study in Central Sulawesi province- Indonesia (Hijra *et al.*, 2016) that found 40.5% with low timely complementary feeding (56.4%), appropriate meal frequency (60.6%) and dietary diversity of 40.5% in a community-based cross-sectional study in North-West Ethiopia (Gessese *et al.*, 2014). The findings indicate poor infant and young child feeding practices in Katanga area.

5.4 IYCF knowledge and attitude

The study indicates that the knowledge levels of mothers/ care takers on IYCF practices were low, as 56.4% thought the children need to be given watery porridge and 40% thought so because watery porridge was easier to drink. 67.1% of the mothers/ care takers obtained their information from health centers. However, mothers/ care takers' attitude towards IYCF was above average as 92.1% thought it was good to continue breastfeeding beyond six months, 88% had no difficulty to continue breastfeeding. 57.1% said it was good to feed the child several times in a day with 79.3% saying it was good to give different types of food to the child each day and 69.3% having no difficulty with giving the child different types of food each day.

5.5 Context specific complementary feeding recipe.

There was convincing evidence that behavioral change nutrition education influence the adoption of dietary diversity, nutrition knowledge, attitude and practices of mothers/ care takers on infant and young child feeding practices. Majority of the mothers/ care takers n=83 (59.3%) put the recipe ad its recommendations into practice. 57 mothers/ care takers reported never to have practiced the recipe due to different barriers; time (37, 64.9% mothers/ care takers reported), money (18, 31.6% mothers/ care takers) and season (2(3.5%) mothers/ care takers) that hindered the adoptability of the recipe. More so, 72(86.7%) mothers/ care takers were willing to continue putting the recipe and its recommendations into practice and 51(61.4%) mothers/ care takers had a belief that the child liked the food as recommended in the recipe.

The results are similar to complimentary feeding behavioral change interventions in children aged 6-23 months improved their feeding practices and growth in 29 studies conducted in developing

countries (Cecilia *et al.*, 2014; Fahmina *et al.,* 2014) in which they were adopted and the study in food insecure areas where participatory community based nutrition education for care givers improved dietary diversity of children 6-23 months of age (Kuchenbecker *et al.*, 2017). Also, the results are comparable to post nutrition education program studies that revealed nutrition education programs had a positive impact on IYCF indicators in the intervention groups in Kenya and Western Uganda (Ickles *et al*., 2017; Mutiso *et al*., 2018).

CHAPTER 6

6.1 Conclusion

The adoption of behavioral change nutrition education was averagely good with majority of the mothers/ care takers n=83 (59.3%) putting the recipe and its recommendations into practice. Nutrition education programs aimed at social behavioral change and improving the nutrition status of children are greatly adopted by mothers/ care takers and show an evidence of significance.

6.2 Recommendation

I recommend;

Promoting of home and kitchen garden programs in the social behavioral change interventions to improve the adoptability of the recipes in communities as this will enable accessibility of different varieties of foods recommended in the recipe.

Incorporating feasible and sustainable income generating education programs to enable capability among mothers/ care takers who are practicing the recipes since money was one of the major challenges faced by mothers/ care takers adopting the recipe.

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APPENDICES

Appendix 1.

Questionnaire about effectiveness of promoting context specific complementary recipes on improving nutrition status and dietary diversity of children aged 6-23 months in Katanga slum

Greetings, I am a final student of Human Nutrition, at Makerere University. I would like to know more about your knowledge, attitudes and practices towards nutrition of infants and young children. The interview will take few minutes. All the will information I obtain will remain strictly confidential and your name will never be revealed. You are not obliged to answer any question you do not want to, and you may stop the interview at any time. This is not to evaluate or criticize

you, so please do not feel pressured to give a specific response and do not feel shy if you do not know the answer to a question. (I am not expecting you to give a specific answer; I would like you to answer questions honestly, telling me about what you know, do and how you feel. Feel free to answer questions at your own pace).

Do you agree to participate in this interview?

Yes ☐ No ☐ If yes, continue to the next question;

If no, stop the interview.

Do you have any question before we start? (Answer questions).

Start now!

Researcher ID No……..

SECTION A: BIODATA (CHILD)

A1. Child's 1D NO..... A2. Name of the child……..…….

A3. Sex: Male ☐ Female ☐

A4. Date of birth …….....

(Verified with document (Immunization card, Birth certificate) YES ☐ NO ☐ A5. Age of child in months……..

SECTION B: DEMOGRAPHIC DATA (CARE GIVER /MOTHER)

Bl. Age of mother in years

1) <19 ☐

2) 20-30 ☐

3) 30-35 ☐

4) >35 ☐

B2. Marital status

1. Single ☐ 4 widowed ☐
2. Married ☐ 6 Separated ☐
3. Divorced ☐ 7 Single parent ☐
8 Other (specify) …… ☐

B3. Level of education

1) No formal education ☐ 5) Diploma level education ☐
2) Not completed primary ☐ 6) Certificate level training ☐
3) Completed primary ☐ 7) Degree level ☐
4) Secondary Education ☐ 8) Adult education ☐

B4.Religion of the mother

1. Anglican ☐ 4. SDA ☐
2. Catholic ☐ 5. Pentecostal ☐
3. Muslim ☐ 6. Other
(specify)……

B5. How many children do you have? ……

B6. How many children are below 5 years of age? ……..

B7. Do you have any children who passed on? YES/NO. If yes, how many.....

SECTION C: SOCIO-ECONOMIC DATA

Cl. What are your sources of income?

1) Salaried job ☐
2) Husband ☐
3) Business ☐
4) Casual work ☐
5) Others ☐ ☐ ☐ ☐ ☐

(Specify)……

…….

C2 what is your occupation?

1) Casual worker
2) House wife
3) Office job
4) Self-employment
5) Agriculture/farmer

6) Others

(specify)……

……

C3. What is your husband's occupation?

1) Peasant ☐

2) Casual worker ☐

3) Businessman ☐

4) Formal office Job ☐

C4. Housing structure

1) Rented house ☐

2) Own house ☐

3) Sharing house with friends ☐

C5. Floor type

1) Mud ☐ 2) cement ☐

3 Other (Specify) ……

C7. What is your main source of lighting?

1) Kerosene ☐ 2) Candle ☐

3) Electricity ☐ 4) Solar ☐ 5)

Others (Specify .....

C8. What is your main source of cooking fuel?

1) Firewood ☐ 5) Charcoal ☐

3) Kerosene ☐ 6) Gas ☐

4) Electricity ☐ 7) other

(specify).....

C9.Where do you obtain food from?

1) Own production ☐ 3) Shop ☐

2) Market 4) Others Specify……..

C10. In your house, who mainly makes decisions on the purchase of food consumed in the household?

1. You ☐ 2 Husband/partner ☐ 3 Decision as a couple ☐

4 You and another adult person in the household ☐ 5 Mother/ Mother In-☐

6. You and mother in law/mother ☐

7. Other (Specify)…….

SECTION D: CHILD FEEDING AND DELIVERY HISTORY

D1. Where was the [name] child born?

1) Home ☐ 2) Health facility ☐

3) Other (Specify)……..

D2. What kind of delivery?

1) Normal ☐ 2) Cesarean ☐

3-Elective cesarean ☐

D3. Child birth order of the index child

1) First born ☐ 2) 2nd -4th born ☐

3) 5th -7th born ☐ 4) 8th-10th born ☐

5) > 10th born ☐

D4. Antenatal attendance

1) Once ☐ 4) >5 times ☐

2) 2-3 times ☐ 5) Did not attend ☐ 3) 4 times ☐

D5. Has this child ever been breastfed? Y☐ NO☐

D6. If yes, how long after birth was the child first put on the breast? ……...HOURS

D7. Is child (NAME) currently breastfeeding? ☐S NO ☐

Section E: Feeding young children (6-23 months)

I am going to ask you some questions about nutrition of infants aged from 6 to 23 months. Please let me know if you need me to clarify any of my questions. Feel free to ask any question you may have.

P.1. Have you ever introduced any solid foods or liquids to this child☐ Yes 2) No☐

P.2: At what age did you introduce any solid foods? (Age in months)

P.3: How many times did (name of the baby) eat foods that is meals and snacks other than liquids yesterday during the day or at night?

1) 2-3 times ☐ 2) 3-4 times ☐ 3) 5-6 times ☐

4) None ☐ 5) don't know / no answer ☐

P.4: Do you use bottle to feed child (name)? 1) Yes ☐ 2) No ☐

P.5 Do you prepare child's meals with general family meals

1) Yes [1] 2) No ☐

P.6. Who in the household mainly makes decisions on what your child should or shouldn't eat or be fed? ---------

☐

1. Mother ☐ 2. Grandparents 3. Other adults in the household ☐ 4. Fa ☐

5. Sibling in the household ☐

6. Others specify…….

☐

P.7. Who feeds your child? …… ☐

1. Mother ☐ 2. Father ☐ 3. Mother in law

4. Other adults in the house ☐ 5. Siblings

Mother/Care giver's Knowledge on IYCF

K1: At what age should babies start eating foods in addition to breast milk?

1) At six months ☐

2) Other ☐

3) Don't know ☐

K.2 Why is it important to give foods in addition to breast milk to babies from the age of six months?

1) Breast milk alone is not sufficient (enough)/cannot supply all the nutrients needed for growth/from six months, baby needs more nutrients in addition to breast milk ☐

2) Don't know ☐

3) Other (Specify)……..

K.3: Thicker or thin (watery) porridge, which one do you think should be given to a young child?

1) Thick porridge ☐ 2) Shows the watery ☐

3) Does not know ☐ .... *Skip to K.6* **K.4: Why did you choose the porridge?**

1) Because the first porridge is thicker than the other ☐

2) Because the thick porridge is more nutritious/because it is prepared with different types of foods or ingredients (food diversity) ☐

3) Watery porridge easy to drink in cup ☐

K.5: Dietary diversity and ways of enriching porridge

To feed their children, many mothers give them rice porridge or millet.

Please tell me some ways to make porridge more nutritious or better for your Baby's health.

Probe if necessary:

Which foods or types of food can be added to porridge make it more nutritious? By adding:

1) Cooking oil (vegetable oil) ☐
2) Blue band ☐
3) Sunflower seed, peanuts, soybeans ☐
4) Don't know

K.6: How do you encourage your child to eat?

1) Clap hands
2) Make funny faces/play/laugh ☐
3) Demonstrate opening your own mouth very wide/modeling how to eat ☐
4) Say encouraging words ☐
5) Draw the child's attention ☐
6) Other (Specify)..…… ☐
7) Don't know

K.7. where do you obtain information about feeding your child? (Tick all that apply) ☐

1. Health Centre ☐ 2. VHTs ☐ 3. Mother in law ☐
4. Grandmother ☐ 5. Other family members ☐ 6. Friends/neighbor
7. Community gathering ☐ 8. Radio/TV ☐

Mother/Caregiver's attitude on IYCF

Attitudes towards an ideal or desired nutrition-related practice

Al. How confident do you feel in preparing food for your child?

1. Not confident ☐
2. Confident ☐
3. Very confident ☐

A2. How good do you think it is to give different types of food to your child each day?

1. Not good ☐
3. Good ☐
2. You're not sure ☐

A2 (1). If not good why? …….

A3. How difficult is it for you to give different types of food to your child each day?

1. Not difficult

2. Very difficult

3. Difficult ☐

A4. How good do you ☐ think it is to feed your child several times each day?

1. Not good ☐
2. You're not sure ☐
3. Good ☐

A5: How difficult is it for you to feed your child several times each day?

1. Not difficult ☐
2. Very difficult ☐
3. Difficult ☐

If Difficult:

a) Hard to keep food warm ☐

b) Child has to feed same meals as rest of family members ☐

c) Child refuses the food ☐

d) Others,
specify……
……

A6: How good do you think it is to continue breastfeeding beyond six months?

1. Good ☐ 2. Not good ☐ 3. You're not sure ☐

A7: How difficult is it for you to continue breastfeeding beyond six months?

1. Not difficult ☐
2. Very difficult ☐
3. Difficult ☐

SECTION F: CHILD NUTRITION STATUS (FOR ONLY CHILDREN 6-23 MONTHS)

Age in months	Sex	Weight (kg)			Height (cm)			MUAC			Edema status
		1	2	Av	1	2	Av	1	2	Av	
Referral											

SECTION G: 24 HOUR DIETARY DIVERSITY QUESTIONNAIRE

Now I would like to ask you about (other) liquids or foods that (name of the baby) ate yesterday during the day or at night. I am interested in whether your child had the item even if it was combined with other foods.

For example, if (name of the baby) ate millet porridge made with a mixed vegetable sauce, you should reply yes to any food I ask about that was an ingredient in the porridge or sauce.

Yesterday during the day or at night, did (name of the baby) eat:
Tick the column Yes or No depending on whether any food item of the list was consumed.

	Question	**Responses**
1.1	How many times did you breast feed NAME from the time you woke up yesterday until the time you woke up this morning?	_____times
1.2	Since yesterday during the day and during last night, did you give (NAME) anything else to eat or drink other than breast milk? *If no, skip to 5.1.32.*	☐ Yes ☐ No

Which liquids did the child (NAME) receive yesterday during the day and during last night, and how often? (Also include home remedies.)

1.3	Water	☐ Yes ☐ No If yes __times
1.4	Cow's milk	☐ Yes ☐ No If yes __times
1.5	Other fresh milk	☐ Yes ☐ No If yes __times
1.6	Milk prepared from powder or formula	☐ Yes ☐ No If yes __times
1.7	Fruit juice	☐ Yes ☐ No If yes __times
1.8	Tea/Coffee	☐ Yes ☐ No

		If yes __times
1.9	Other (specify) _____	☐ Yes ☐ No If yes __times
1.10	How many times did the child (NAME) eat solid, semisolid, or soft foods other than liquids yesterday during the day and during last night? This includes porridges. *If 0 times, skip to P.2.32.*	___times
1.11	Porridge, bread, rice, millet, maize, noodles, or other foods made from grains	☐ Yes ☐ No ☐ don't know
1.12	Pumpkin, carrots, or sweet potatoes that are orange inside	☐ Yes ☐ No ☐ don't know
1.13	Matooke, plantains, Irish potatoes, white sweet potatoes, white yams, cassava, or any other foods made from roots	☐ Yes ☐ No ☐ don't know
1.14	Any dark green leafy vegetables	☐ Yes ☐ No ☐ don't know
1.15	Ripe mangoes, ripe papayas, or any other vitamin A rich fruits	☐ Yes ☐ No ☐ don't know
1.16	Any other fruits or vegetables	☐ Yes ☐ No ☐ don't know
1.17	Any meat, such as beef, pork, lamb, goat, chicken, or duck	☐ Yes ☐ No ☐ don't know
1.18	Liver, kidney, heart, or other organ meats	☐ ☐ No

		☐ Yes ☐ don't know
1.19	Eggs	☐ Yes ☐ No ☐ don't know
1.20	Fresh or dried fish, fish powder	☐ Yes ☐ No ☐ don't know
1.21	Any foods made from beans, peas, lentils, nuts, or seeds	☐ Yes ☐ No ☐ don't know
1.22	Cheese, yogurt, or other milk products	☐ Yes ☐ No ☐ don't know
1.23	Any other oil, fats, or butter, or foods made with any of these	☐ Yes ☐ No ☐ don't know
1.24	Grasshoppers, ants or other insects	☐ Yes ☐ No ☐ don't know
1.25	Any sugary foods such as chocolates, sweets, candies, pastries, cakes, biscuits or sugar in tea/coffee	☐ Yes ☐ No ☐ don't know

1.26	What made you decide to start giving foods to (NAME)? (Do not read the responses. Allow the respondent to answer, and then fill each item.)	not yet started giving foods ☐ Yes ☒ No not enough breast milk ☐ Yes ☒ No baby always crying ☐ Yes ☒ No baby active ☐ Yes ☒ No not enough time to breastfeed ☐ Yes ☒ No baby reaching for food ☐ Yes ☒ No told to do so ☐ Yes ☒ No tradition ☐ Yes ☒ No

Food Frequency Questionnaire for child aged 6-23 months

I'm now going to ask some questions about your child's diet over the last week/7 days. Can you please tell us how many times during the last week (Name of child) ate/drank the following?

Food or liquid	**>7**	**7**	**6**	**5**	**4**	**3**	**2**	**1**	**0**
Cow Milk									
Other milk									
Eggs									
Red Meat									
Chicken									
Mukene									
Other fish (not including Mukene)									
Millet porridge									
Other millet preparations									
Whole grain Maize									
Other Maize									
Matooke									
Cassava									

Bread									
Chapatti									
Beans									
Groundnuts									
Soy Flour									
Orange flesh Sweet Potato									
White flesh Sweet Potato									
Yellow flesh Sweet Potato									
Irish potato									
Green leafy vegetables (such as amaranth)									
Other vegetables									
Vitamin C rich fruit (papaya, mango, pineapple, passion Fruit etc.)									
Other fruit									
Other foods, specify									

Introduce the recipe to the mother and use it to ask the following questions
Have you heard about the recommended child feeding practices or foods before? YES ☐ NO ☐ *Probes: Which ones have you heard about and where have you heard about these promoted?*

For each recipe, is this food normally fed to small children (6-23months) in this community? E.g. Bean +Gnut YES ☐ NO ☐ *How are these foods fed to young children?*
Are these foods eaten by both 6-11months and 12-23month old or is there a difference in what younger children eat? Has anyone tried feeding these foods to their children? What is the experience?
Which of these recommended foods can families access here in the community? *Where are these foods accessed? Which of these foods is produced/grown in this community? Access in terms of price, distance etc. Are there any foods that are never given to children* *Give reasons why?*
Could access to or use of any of the foods recommended in the recipes be affected by seasonality? *Are there seasons when there is more or less production of these recommended foods or to money to buy this food? Which foods? Are there seasons when the prices of these foods go up/down or when less food is available to buy?*
What would families here need to be able to put these recipes into practice (foods and preparation)? What would mothers need to do? What about fathers or other family members? *Time? Skills or information? Better household production? More time, money, support or permission (mother in law/husband/family/friends).*

What do participants believe the role of other people (mothers, mothers in law, and other family members) in supporting women and families to feed their children is? How would these people support the recipes? W*hat would other people say about these recipes (other women, mothers, mother in law, husbands, etc.) Who would approve/criticize? Why?*
What could be said to women or other community members (mothers in law, husbands) to encourage them to put these recipes into practice?
Would anyone like to recommend any changes to the set of FBRs that we have introduced? *Changes to frequency, serving sizes, food, preparation? Changes to how the FBRs are communicated (language, text, visuals, motivations etc.) Does anyone in the here disagree/not support FBRs)*

Thank you for sharing your opinions today. I really appreciate your time and contribution. Do you have something to say before we close?

Appendix 2.

Feasibility and acceptability of putting a set of recipes for 6-23 month olds in Central Uganda into practice

Questions	***Response***
3.1 Have you had a chance to put this recipe into practice over since our last visit in March?	1= yes 2= No (**Skip to section B)**
3.2. If YES, when was the last time that you prepared this food and	1= today 2= yesterday 3 = A week ago 4= 2 weeks a go 5= > 2 weeks ago 6= Never
3.3 How did you prepare it? *Note whether the mother followed the RECIPE correctly (type of food, preparation, frequency). Probe: How did you prepare the food? Did you buy a small amount of this food just for your child? Did you prepare the food just for your child or for the whole family?*	*1= followed whole recipe correctly* *2= Only considered recipe foods* *3= considered recommended frequency* *3= did not follow recipe at all*
3.4 Did you make any changes to the recipe?	1= Yes 2= No
3.5 If yes, what did you change?	*1= the recommended frequency* *2= food, serving size* *3= preparation*
3.6 Will you continue putting the recipe into practice this way?	*1= Yes 2= No*

3.7 How did you feel about putting the recommendation into practice? *Probe: Did you like putting into practice? How did you feel about the taste/texture of the food? Why/why not? Was it easy to prepare? Did you know what to do? Did you have any problems? How much additional time was required to access the necessary foods?*	*1= Yes 2= No*
3.8 Do you believe that your child liked the food? Probe Why/why not? *Did they eat what you gave them?* *How much did they eat?*	1=Yes 2= no 3= not sure
3.9. Did you find that there were any benefits or problems/harm for your child or anyone else in your family that resulted from putting this recipe into practice? Explain? Probe: *Did you find that it saved you time or was good for your child? OR was it hard for your child to eat, made child sick, wasted money, wasted time etc. If you purchased the recipe foods, did you have to give up other items for the family or for the baby?*	*1= Yes 2= No*
3.10 Were you able to put this recipe into practice yourself or did you need permission or help from someone else? (Probe Did you need permission from your husband or mother in law or someone else? Did you need to ask for money? Who did you speak with? Why? What did this person say? Did that impact your ability to use the recipe?)	*1= Yes 2= No*
PART B: **3.11 If** the mother did NOT put this recipe into practice or faced any issues or barriers she faced to putting this recipe into practice, AND IS OPEN TO DISCUSS FURTHER, ask her about the barriers and categorize the barriers she faced (time, money, fuel?).	
3.12 Based on any barriers you faced, would you need to modify this recommendation to make it possible for you?	*1= Yes 2= No (specify if yes)*
Part C. 3.13 How could seasonality affect your use of this recommendation? **Probe:** *Are there seasons when you have more/less access to or production of the recommended food or to money to buy the food? Or when this food is more/less expensive? Or more/less time to prepare food? When? How would this affect your potential use of this food and the diet of your child?*	1= yes 2 = No

3.14 Will you put this recommendation into practice in the future/continue to put the recommendation into practice? 1 Probes: Do you want to? What will you do? *Why/ why not? How often? For how long? Will you change the recommendation in any way?*	

Finish the interview with the following questions:
3.15 Did putting any of the RECIPES into practice mean a change in normal food spending? 1= yes 2= No 3= don't know ……. Probe: *Did you spend more/less money than you usually would to buy food for your child? Would you be able to sustain this until the baby turns two years old?*