

Common Complementary Feeding Practices Among Under-Five Children: The Case of Zambia

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Abstract

Introduction: In the past several decades, Zambia has suffered high levels of under nutrition particularly stunting among children below 5 years of age. Although appropriate complementary feeding practices are reported to reduce child deaths by 6%, they have not received the adequate attention from programme officers and caregivers in terms of implementation.

Objectives: The objective was to investigate issues surrounding the common complementary feeding practices practised by caregivers of children below five years in health facilities and areas where high rates of malnutrition admission come from.

Design: A cross sectional research using both qualitative and quantitative methods. The study used mostly proportions based mostly on global indicators on complementary feeding. Qualitative data was also analysed according to themes of global complementary feeding indicators

Setting: The study was conducted in five hospitals, namely Arthur Davison, Solwezi Central, Kabwe and Livingstone General, and University Teaching Hospital.

Subjects: The target populations were mothers whose children were admitted for malnutrition and those with children 0-59 months living in communities with the highest number of malnourished cases admitted to selected hospitals

Results About 45.2% (190) of caregivers introduced liquids before six months of age and 7.6% (32) after 6 months attributing child thirst, medication and advice from health worker as the main reasons. Slightly above half (54.2% of 224) of mothers/caregivers used cups to feed their babies. The use of feeding bottles was still common (8.2% of 34). Responsibility to feed the child is mostly left to the mother (86.4%, 362). In addition, children were being feed about 2.67 (SD 0-72) per day.

Conclusions: Child feeding practices were still poor. This contributes to poor child growth and health. More interventions should be planned to improve child care behaviour.

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Citation: Raider Habulembe Mugode, Musonda Mofu, Oliver Mweemba (2019) Common Complementary Feeding Practices Among Under-Five Children: The Case of Zambia. International Journal of Nutrition - 4(3):7-19. <https://doi.org/10.14302/issn.2379-7835.ijn-19-2721>

Keywords: caregivers, child growth, complementary feeding, quality of diet, undernutrition

Received: Mar 20, 2019

Accepted: Apr 08, 2019

Published: Jul 05, 2019

Editor: Monica Butnariu, Banat's University of Agricultural Sciences and Veterinary Medicine "King Michael I of Romania" from Timisoara, Timis, Romania

Introduction

Complementary feeding (CF), one of the many nutrition interventions considered to have high impact in reducing stunting, has in the past not received much attention. According to Krebs, (2007),¹ despite evidence of breastfeeding being adequate up to 6-7 months of age as way back as the 1700s, commencement of CF fluctuated from 4 months in the 1800s to about 2 months of age in the 1950s. Development in technologies (such as infant formula and baby foods), increase in the number of working mothers, and social and cultural change that occurs in societies overtime may be responsible for the fluctuation² which may be partly responsible for poor health being experienced currently especially in developing countries.

Enormous evidence exists regarding the role of complementary feeding (CF) practices in child survival, growth and development. About 6% of child deaths can be prevented with appropriate CF³. When the intervention is combined with appropriate breastfeeding practices and other key nutrition interventions, the impact is even greater^{4,5}. With such evidence, complementary feeding interventions are slowly gaining attention from policy makers.

Complementary feeds are recommended to commence at 6 months of age to support growth and development, and prevent under nutrition of children moving from exclusive breastfeeding or a diet dominant of breast milk to semi solid or solid foods diets^{6,7}. It is from this point in a child's life up to about 24 months of age when stunting sets in for most children probably due to poor quality and quantity diets, poor mother child interactions during feeding, and infections that most children suffer in developing countries^{4,10-12}. This is the period when growth and development in a child's life is greatest and when interventions offer the most benefits to the growing children¹³⁻¹⁵.

Adequate CF considers aspects of quality, quantity and frequency of feeds and motivation to feed a child^{6,16,17}. When these aspects and other key child care practices such as breastfeeding, health care seeking; water, sanitation and hygiene¹⁸ are compromised, undernutrition sets in^{19,20}. Undernutrition is responsible for about 45% of child deaths²¹. In

Zambia, About 51.1% of children are introduced to complementary feeds by 4-5 months of age while 93.7% by 6-8 months. About 66% consume the minimum recommended food diversity (3 or more food groups for breastfed and 4 or more food groups for non-breastfed children)²².

CF activities in Zambia are mostly being implemented through the Maternal Adolescent and Young Child Nutrition programme implemented by Ministries of Health, Ministry of Community Development and Social Welfare and to some extent by Ministry of Agriculture and Livestock. The interventions are targeted at household level where they are known to be effective in reducing stunting.

Currently, research is available on the prevalence of complementary feeding practices but there is limited information on households' practices on complementary feeding interventions in Zambia. This paper reports on the complementary feeding practices among caregivers living in communities contributing the highest rates of malnutrition admission in five health facilities. It is based on data that was part of the cross sectional study on "Childcare practices from conception to five years of life in selected provinces of Zambia: Implications for Child survival and growth" conducted in 2012.

Methods

The data was obtained from a cross sectional research using both qualitative and quantitative methods. The study was conducted in five hospitals (Arthur Davison (third level), Solwezi Central, Kabwe and Livingstone General (Second levels); and University Teaching Hospital (Third level), which were purposively selected from the five provinces (Central, Copperbelt, North-western, Lusaka and Southern). Selection of the five hospitals was based on the NFNC, 2008 study which showed high levels of malnutrition cases admitted in these hospitals.

The target population were mothers/caregivers whose children were admitted for malnutrition in the selected health facilities and those with children 0-59 months living in communities with the highest number of malnourished cases admitted to hospitals. Communities were identified based on the hospital records for the

2010 calendar year.

Given that there was no sampling frame, households were selected using the multistage household sampling approach in three stages. The first stage involved identifying the centre of the selected community; the second stage involved spinning a bottle to randomly select a direction from which to choose the first household. The third and final stage involved identifying a random household along the chosen direction pointing outwards from the centre of the community to its boundary. Households, with children 0 – 59 months old, in the chosen direction were counted. Then, the sampling interval was determined and a random starting household was identified between one (1) and the sampling interval ¹.

In-depth interviews were conducted from six mothers with children admitted for malnutrition in each of the selected hospitals using a checklist. In total, 30 in-depth interviews were conducted and 421 households were selected and interviewed.

Tools were pre-tested on communities outside the study area with similar characteristics to the target population. Quantitative data was entered on computer using Epi-Data software version 3.1 and analysed using SPSS version 17.0. Only descriptions were used in this paper which were linked to qualitative data to make situations for prevalence of practices. Qualitative data was analysed thematically. The themes were identified by two researchers working independently and later compared the themes and agreed on the final coding structure.

Ethical clearance was sought from the Research Ethics Committee of the University of Zambia (FWA0000338 and IRB00001131 of IORG0000774). Permission was sought from the Permanent Secretary of the Ministry of Health. Informed consent was obtained in writing from respondents and participation was not compulsory.

Results

Characteristics of Study Participants

In terms of qualitative interviews, 30 respondents (6 from each of the five hospitals visited) participated in in-depth interviews (Table 1). The respondents had attained either primary or secondary

education. In addition, the majority were married with 1-2 children. Their economic activities were mainly in the informal sector.

Quantitative interviews show that 98% (413) of respondents were mothers of the targeted children (Table 2). The majority were married, had primary education, were not employed, came from male headed households and were young, below the age of 35.

Complementary Feeding Practices

Introduction of Liquid and Solid Foods

Table 3 shows that 45.2% (190) of caregivers introduced liquids before six months of age and 7.6% (32) after 6 months. Water was the most common of the first liquids introduced (88%, 360). The reasons cited for early introduction of liquids were that babies get thirsty, such as the following quote "*the baby used to be thirsty*" (Interview participant). Some respondents said they were advised by the health workers to give water. One of the interview respondent said; "*they [health workers] used to teach us that a child is supposed to be given water*". Other respondents also cited the medication that was given to the child as the reason for giving the child some water.

About one third (34.9%, 145) of mothers/caregivers introduced solids before 6 months of age, and 13.2% (55) introduced solids after 6 months. Mothers reported introducing various solid foods to their babies including maize and cassava porridge and fruits among others. The common type of first solid or semisolids foods given to children was maize porridge (68.7%, 279). The main reason why solid foods were introduced early was that breast milk alone was not considered as being enough for the infant(s). Below are quotes from two interview participants:

The breast milk was not enough because I had two babies [twins]. They were crying a lot

The milk was not enough because I had an abscess on one breast [so] I was just using one breast.

Others also brought out the issue of sero HIV positive status. One interview participant indicated that:

"they did not find me well [HIV+], so if I fed [my baby] on other foods"

Table 1. Social demographic characteristics of qualitative interview participants residing in areas where majority of malnutrition cases come from.

| Variable | Number | Percent |
|---------------------------|--------|---------|
| Educational level | | |
| None | 1 | 3.3 |
| Primary | 15 | 50 |
| Secondary | 14 | 46.7 |
| Marital status | | |
| Married | 23 | 76.7 |
| Not married | 7 | 23.3 |
| Number of children | | |
| 1-3 | 22 | 73.3 |
| 4-6 | 8 | 26.7 |
| Household size | | |
| 1-4 | 4 | 13.3 |
| 4-6 | 19 | 63.3 |
| >6 | 6 | 20.1 |
| Don't know | 1 | 3.3 |
| Occupation | | |
| Formal | 1 | 3.3 |
| Informal | 23 | 76.7 |
| Dependent on relatives | 1 | 3.3 |
| Don't know | 5 | 16.7 |

N=30

Table 2. Social demographic characteristics of quantitative interview participants residing in areas where majority of malnutrition cases come from

| Variable | Number | Percent | Variable | Number | Percent |
|---------------------------------------|--------|---------|---------------------------------|--------|---------|
| Care giving | | | Education-household head | | |
| Mot | 413 | 98.1 | None | 16 | 3.8 |
| Other caregivers | 8 | 1.9 | Primary | 152 | 36.1 |
| Marital status | | | Junior secondary | | |
| Married | 369 | 87.6 | senior secondary | 118 | 28.0 |
| Windowed | 20 | 4.8 | Tertially | 8 | 1.9 |
| Divorced | 14 | 3.3 | Employment | | |
| Never married | 12 | 2.9 | Informal | 311 | 73.9 |
| Separated | 6 | 1.4 | Formal | 82 | 19.5 |
| Age of mother/caregiver | | | Not employed | | |
| 15-25 years | 203 | 48.3 | Household size | | |
| 26-35 years | 166 | 39.4 | 1-3 members | 74 | 17.6 |
| 36-45 years | 46 | 11.0 | 4-6 people | 236 | 56.1 |
| 46-55 years | 3 | 0.7 | 7-9 members | 86 | 20.4 |
| greater than 55 | 2 | 0.5 | Children underfive | | |
| Education of mother/caregiver | | | one child | | |
| None | 23 | 5.5 | two children | 141 | 33.5 |
| Primary | 236 | 56.1 | Sex of children | | |
| Junior secondary | 108 | 25.7 | Male | 229 | 54.4 |
| Senior secondary | 54 | 12.8 | Female | 192 | 45.6 |
| Occupation of mother/caregiver | | | Place of birth | | |
| Employed | 161 | 38.3 | Health facility | 345 | 81.9 |
| not employed (housewives) | 260 | 61.7 | Home | 70 | 16.6 |
| Age of household head | | | Other places | | |
| 15-25 year | 51 | 12.2 | Household headship | | |
| 26-35 years | 182 | 43.5 | Male headed | 368 | 87.4 |
| 36-45 years | 126 | 30.1 | Female headed | 53 | 12.6 |
| 46-55 years | 40 | 9.6 | | | |
| above 55 years | 19 | 4.5 | | | |

N=421

Table 3. Complementary feeding practices among mothers/caregivers residing in areas where majority of malnutrition cases come from.

| Complimentary feeding practices | No. | % | Complimentary feeding practices | No. | % |
|---|-----|-------|---|------------|--------------|
| Who feeds the child | | | Utensils for feeding() | | |
| Mother | 362 | 86.4 | Spoon | 160 | 38.7 |
| Grandmother | 22 | 5.3 | Cup | 224 | 54.2 |
| Sister | 19 | 4.5 | Bottle | 34 | 8.2 |
| Aunt | 5 | 1.2 | Age first solids were introduced | | |
| Neighbour | 1 | 0.2 | One Month. | 3 | 0.7 |
| Father | 2 | 0.5 | Two Month. | 15 | 3.6 |
| Other | 8 | 1.9 | Three Month | 35 | 8.4 |
| Total | 419 | 100 | Four Month. | 50 | 12.0 |
| Residence of the person who feeds the child | | | Five month | 42 | 10.1 |
| Lives in the house | 415 | 99.0 | Six Month. | 206 | 49.5 |
| Lives outside the home | 4 | 1.0 | After six Month. | 55 | 13.2 |
| Total | 419 | 100.0 | Breastfeeding | 10 | 2.4 |
| Person who mostly decides food to feed the child | | | Total | 416 | 100.0 |
| Mother | 358 | 85.2 | First solid or semi solid food | | |
| Grandmother | 33 | 7.9 | Maize Porridge | 279 | 68.7 |
| Sister | 2 | 0.5 | Cassava Porridge | 7 | 1.7 |
| Aunt | 3 | 0.7 | Fruits | 1 | 0.2 |
| Father | 9 | 2.1 | Other | 119 | 29.3 |
| Other | 15 | 3.6 | Total | 406 | 96.4 |
| Total | 420 | 100.0 | | | |
| Age other liquids other than breastmilk were started | | | Child's appetite when healthy | | |
| Less than 1 month | 23 | 5.5 | Very well | 208 | 51.0 |
| 1 Month | 10 | 2.4 | Well | 146 | 35.8 |
| 2 Month | 26 | 6.2 | Little/satisfactory | 51 | 12.5 |
| 3 Month | 40 | 9.5 | Very little/unsatisfactory | 3 | 0.7 |
| 4 Month | 48 | 11.4 | Total | 408 | 100.0 |

| | | | | | |
|-----------------------------------|-----|-------|--|------------|--------------|
| 5 Month | 43 | 10.2 | Measures to motivate the child to eat | | |
| 6 Month | 186 | 44.3 | Sings, speaks to the child | 99 | 25.1 |
| After 6 Month | 32 | 7.6 | Forces the Child | 16 | 4.1 |
| Breastfeeding | 9 | 2.1 | Does nothing | 110 | 27.8 |
| could not remember | 3 | 0.7 | Asks another person to feed | 89 | 22.6 |
| Total | 420 | 100. | Other | 81 | 20.5 |
| Name of first liquid given | | | Total | 395 | 100.0 |
| Water | 360 | 88. | | | |
| Tea/ Coffee | 2 | 0.5 | | | |
| Formula | 18 | 4.4 | | | |
| Could not remember | 3 | 0.7 | | | |
| Other | 26 | 6.4 | | | |
| Total | 409 | 100.0 | | | |

Food Choices and Type of Foods Given to the Children

Through exploring the various types of foods given to the child, most mothers/caregivers were aware that "foods like milk, banana, oranges, fruits, meats, fish, eggs, beans and groundnuts ..." were essential for the children to grow and be healthy. However, most respondents indicated that some of these foods, especially meat, were not easy to come by because of poverty:

I cannot manage because meat and kapenta are quiet expensive and we parents are both not working. Unless those foods that we grow like groundnuts, beans and sweet potatoes I can manage."

Most of the mothers/caregivers used porridge and nshima as the primary source of food. For example one of the participants indicated that she "cooks for her [the baby] porridge in the morning and nshima in the afternoon" (A 30 year mother of a 7 month baby).

Diversity was usually attempted by mothers/caregiver, as the case was for one mother with a malnourished child. She indicated how she used to mix porridge with other foods in an attempt to make it more nutritious.

Like the time she had swollen feet, I used to mix a lot of foods in the porridge. I would put millet flour

with kapenta and add groundnuts in it. If it was too thick I would even mix it with the soup from the relish.

There were some foods that mothers/caregivers considered bad and did not recommend for children. "Maheu, fritters, chikanda, and sweet potatoes, are [considered] bad for the children". Some participants also felt the meat was not good enough. A participant explicitly said that "Foods like meats may bring rash [skin sores] to the child, especially pork meat". Other foods mentioned were green vegetables such as rape and chinese cabbage which were thought of being bad due to fertilizer that is applied to it. Guava was also mentioned as bad due to the hard seed, which they alleged caused damage in the gut. Sweets were also added to the list as they were reported to make the child lose appetite for food.

There was also a gender dimension to food consumption patterns. Findings indicate that girl children were forbidden to eat fresh groundnuts while boys children were denied goat meat. For example, some participants said that tomatoes, 'impwa', and goat meat were not recommended to be eaten by male children for various reasons. Here are the reasons provided by one of interview participants:

Because impwa and tomatoes are round like the

scrotal sacks and if the boys eat that, their testicles would go inside [hibernate inside the body). For goat meat, some may suffer from fits and epilepsy.

Consistency of Feeds

Mothers were giving children food of varying consistency. Porridge with light consistency was preferred for some mothers because they felt that it was easy to swallow, easier to force into a child's mouth and that some children refused to eat thick porridge. A 40 year old Ndola mother with a 20 month old child said that "*mostly I do give her light foods like rice with groundnuts but very light so she swallows it easily.*" Some mothers/caregivers reported feeding medium thick porridges as they felt that's what was needed for their children at their age. A 22 year old respondent with a 9 month old baby had this to say: Fya size (meaning neither very thick nor very liquid). yes, just in between..... that is what he needs at this age, not very thick foods, he needs to be given just fya size....thick food he will start doing like he wants to vomit, like porridge, he will start behaving like he wants to vomit

Some mothers delay giving thicker porridge until the child is one year old.

Feeding Utensils

About half (54.2% of 224) of mothers/caregivers used cups to feed their babies while 38.7% (160) used a spoon. Use of feeding bottles was still common (8.2%, 34). A few who used the bottle for feeding cited their inability to produce enough breast milk for the baby. One of the respondents argued, "*Sometimes I just buy milk since I do not produce a lot of breast milk. I just buy milk so that he feeds from the bottle.*" Another mother/caregiver said argued that a feeding bottle was ideal for women who were working:

I think the use of the feeding bottle do help in one way; especially for mothers who work. They can use it as long as they buy milk at all times so that it does not run out. *It helps so much in my own thinking.*

Some health workers were also cited to be guiding women on how to use bottles to feed the baby. One of the mother/caregiver indicated that they were taught how to keep the bottle clean. Here are her words:

We are taught even in the clinics that if you feed

your child using a feeding bottle you should be keeping it clean and every time you are feeding the baby you should be covering it. And after each feed you should wash it in hot water.

Responsibility to Feed the Child

Responsibility to feed the child is mostly left to the mother (86.4%, 362). This was so because they were always at home and they knew what the child needed. When asked why there was little involvement from the father of the child, some women indicated that men were mostly not at home. One of the mother/caregiver responded in this way:

Usually he is not at home. If he is not gone for piece work then he goes for drinking. So I am with the child most of the time.

Some women also indicated that there was less participation from men because, as women, they had expert knowledge about feeding the child. A 23-year-old woman who participated in the interviews put it this way:

I know that when I give my child this amount of food he will be full and this amount of food he will not be full, that he likes this and not that, it is me who knows....he [father] can't know because he is not always at home with him.

One of the mothers/caregivers also brought out issues of gender division of labour where she indicated that men's role is to provide the resources needed for the baby and a woman's role is to feed the child. Here is what a 32 year old mother/caregiver said: I feed her alone... his [husband] task is to look for money to buy food, but feeding the baby, it's me....when he comes home he finds that she has already eaten.

Almost all ([99%, 415) people responsible for feeding the child lived in the same household where the child lived. Decision making on what children eat was mainly made by the mother (85.2%, 358).

Feeding Frequency

Tables 4 shows that the average number of meals for children was 2.67 (SD 0-72) per day. In terms of snacks, 41.2% reported that the child ate one snack per day while 21.3% reported that they did not give their child any snacks. The average number of snacks

Table 4. number of meals and Snacks eaten per day for children living in communities where malnutrition rate of admission is highest

| Meal/Snack variable | Normal meals/day | | Snacks/day | |
|---------------------|------------------|-----------|------------|-----------|
| | No. of meals | Frequency | Percent | Frequency |
| 0 | 11 | 2.6 | 88 | 21.3 |
| 1 | 16 | 3.8 | 170 | 41.2 |
| 2 | 82 | 19.6 | 143 | 34 |
| 3 | 304 | 72.7 | 10 | 2.4 |
| 4 | 4 | 1.1 | 1 | 0.2 |
| 5 | 0 | 0 | 1 | 0.2 |
| 6 | 0 | 0 | 0 | 0 |
| 7 | 1 | 0.2 | 0 | 0 |
| Total | 418 | 100 | 413 | |

N= 418,

per day was 1.19 (SD of 0.82). Mothers/caregivers reported porridge as the commonly fed food to children in the morning, while Nshima was given at noon and supper. The snacks that were given included fruits, which were given at mid-morning and mid-afternoon.

Motivation to Eat

Mothers/caregivers were further asked on how they motivated their children to eat. About 25.1% (99) reported that they motivated their children to eat by singing, speaking with the child, 22.6% (89) asked other people to feed their children, 4.1% (16) forced the children to eat while 110 (27.8%) reported not doing anything. Similar issues also emerged from a qualitative interviewee who also indicated that they tried different foods and at times, they forced their child. Here are the words from one of the participants:

If there are other foods I need to give another food and if he does not want to eat, I force him to eat even just a little, then leave him and give him water (A 22 year old woman).

Other participants indicated that they took their children for medical attention if they continued refusing food and were being difficult when it came to eating. One respondent expressed what she does in this way:

If he continues to refuse for the next 2 days,

then we would take him to the clinic. And usually they will give us some vitamins so that his appetite comes back to normal. I do continue to give him the vitamins until he starts eating well (Interview participant).

Regarding how they fed their child when sick most, women mentioned what they did when the child had diarrhoea. Here is an example from a 22 year old woman whose child was admitted in hospital for malnutrition:

When he has diarrhoea, I make sure I feed him more frequently because of need for water. I also give him ORS. There are certain times when he loses appetite and sometimes he has no strength, I feed him Nshima and he doesn't refuse most of the time.

Other respondents mentioned the foods which needed to be avoided when the child was sick. When the child had diarrhoea, foods such as yoghurt and juices were reported to be avoided. Milk was also mentioned as food to be avoided as it is known to cause diarrhoea. When the child was coughing, sweets and sugar were discouraged. A 23-year-old mother further recommended the withdrawal of meat from the child's diet because it was believed that it caused convulsions. Here is an excerpt of her sentiments: but meat I do not give him because people say that if a child is sick, that is

twitching as he does, you should not give him meat or any blood foods. So, I don't give him.

Discussion

The findings show that appropriate complementary feeding practices are still not well adhered to by mothers/caregivers due to various reasons including inadequate child feeding knowledge and beliefs that interfere with food distribution in the household. However, when interpreting results it should be considered that the data was based on self-reporting which could lead to over reporting of good practices which were not observed. If this occurred, prevalence of the good practices could be lower than reported in this study.

In order to get full benefits of breastfeeding and maximise growth in early life by reducing on disease burden, it is recommended that liquids and other foods should be introduced at 6 months of age ⁷. The findings on this study show that majority of children start liquids and solid feeds both too early and late for their age. Introducing liquid and solid foods early make the child take less breast milk for their age than is required making the child miss out on the nutritional benefits of the breast milk ⁶. However, breastfeeding should be maintained until 2 years or beyond in order for the child to benefit from the close to half of nutrients breast milk contributes in the second year of life (Dewey In: WHO, 2003)⁶. A longer breastfeeding period has been associated with lower disease burden of children ²³, greater linear growth ²⁴ and delayed onset of lactational amenorrhea thus acting as family planning ^{6,25}.

Practices such as active or responsive feeding, observing the quantity of food the child takes per meal, food consistency and meal frequency are recommended practices to ensure the child takes enough food to provide the nutrients required for adequate growth. This study reveals that very little is done by the caregivers to motivate their children to eat; children receive fewer numbers of meals per day and food consistency is too light for their age. Responsive feeding (motivating the child to eat) entails offering some form of help to children as they eat while encouraging them to eat; trying different food preparations; minimising destruction and offering love to the child ⁶. Children who are not motivated to eat may not improve their

appetites¹⁶. Studies have also demonstrated the important role responsive feeding has on child growth and development ^{16,26}. The finding that caregivers do not take much effort to motivate their children has also been reported in various parts of the globe ^{27,28}.

Although the importance of observing food consistency given to children from 6 months seemed not to be a matter of concern to caregivers, foods that are too thick before 6 months and too light after 8 months as reported in this study, pose danger to meeting the nutrient intake of children. At 6 months of age, children need to be introduced to liquids and other foods while ensuring that consistency and variety of foods are increased as the child gets older ^{7,29}. By 12 months of age a child should be able to eat family foods (Dewey & Brown In: ^{6,30}. Observing the important role that nutrient dense foods play in meeting the nutrients needs of children is also an important factor in improving the lives of children ^{6,31}. Poor motivation skills and food consistency were accompanied by fewer number of meals that most children are taking (three and below meals and one or less snacks a day) increasing the possibility to intake of quantity and poor quality of foods.

Food choices, dietary diversity and preparation are important part of complementary feeding practices ¹⁷. The findings of this study show that children were not given adequate animal source foods compromising the dietary quality. Plant source foods alone are not enough to meet the nutrient needs of children. Therefore, animal source would complement the diet¹. According to PAHO-WHO, (p. 22)⁶ children should "eat meat, poultry, fish or eggs daily or as often as possible". A combination of the above three factors (poor motivation, fewer meals and lack of animal source), may entail inadequate nutrient intake which if left for too long unattended to, may result in malnutrition. This is likely to one of the reasons why Zambia has had high stunting levels for over 3 decades. Within the same age group high incidents of diarrhoea rates have been reported ¹² probably due to compromised immune system resulting from poor nutrition.

Stewart's (2013)¹⁷ analysis of several evidences linked infection as a contributor to stunting by either increasing nutrient needs or reducing uptake or

absorption. Feeding during illness in the study area seems to be inadequate mostly due to poor appetite of children, early interruption of breastfeeding (before 2 years) and poor coaxing skills by caregivers. Caregivers also reported low number of meals during illness. Because of inadequate food intake, meeting nutrient requirement and recovery becomes a challenge.

Inappropriate complementary feeding practices were common due to mothers/caregivers' poor knowledge of appropriate complementary feeding practices which can be improved if they receive adequate health education and support from the health care facilities and the community they live in³². Findings of this study also show that health service providers are not adequately equipped with knowledge and skills to effectively counsel mothers on complementary feeding practices. Although complementary feeding has been part of messages that are taught through the maternal Infant and Young Child Feeding trainings for service providers, very few mothers/caregivers seem to be reached to practice them to the benefit of the children. Inadequate programs to scale up infants feeding programs could also be one of the major reasons for this poor knowledge transfer. Poor income sources and myths about food to enable families' access food are some of the reasons for poor practices. Some practices aimed at increasing number of meals and consumption of meat in the children's diet may need to be addressed beyond the health sector by promoting sectoral collaboration so that programs addressing issues of food security (such as animal, crop, and fish production) and increasing income of families can be implemented side by side with infant and young child feeding programs.

Taboos, including those based on gender as reported in this study could lead to inadequate food intake³³ especially in areas where food is limited and the prohibited foods (such as groundnuts and goat meat) are the commonly eaten foods and an important source of protein.

The study should be interpreted based on the scope of the site considering that the study was based on hospitals with highest levels of malnutrition and respondents were from areas in the districts with the highest admission in those hospitals. The study was also based on the recall of the caregivers from previous

experience which is subject to loss of some level of memory over time.

Conclusion

In summary, poor feeding practices do exist in communities and seem to be chronic as they are likely to have been adhered to by communities for over many years. This may explain the reasons why malnutrition is so high in the areas studied. A deliberate action at policy, health systems, and community levels should be taken to scale up interventions that support appropriate complementary feeding practices. However, more research is required on direct observation of food intake of children and the feeding care behaviours to confirm reports from caregivers

Acknowledgements

This research was made possible with funding from the National Food and Nutrition Commission. We would like to thank Chisambi Laima, Bisalomo Mwanza, Twaambo Michelo, and Edson Phiri for assistance in qualitative data coding and analysis. Appreciation goes to Simubali Chiabi and Kango Mbewe for quantitative data entry. We appreciate the work of all field research supervisors during data collection and compilation of the report and research data collectors. Exceptional appreciation is also given to the Ministry of Health (MOH), provincial health offices and district health management teams for allowing the survey to take place in their facilities and for allowing members of staff to participate.

Contribution of Each Author.

Raider Habulembe Mugode contributed to the design of the study, participated in data analysis, drafted the manuscript and led the writing and provided supervision of the project. Oliver Mweemba contributed to the design of the study, participated in data analysis, provided overall supervision of the study, commented and edited manuscript and approved final manuscript. Musonda Mofu commented and edited the manuscript and approved the final version of manuscript.

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