





A qualitative analysis of infant and young child feeding practices in rural Rwanda

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Abstract

Objective: To explore and gain an in-depth understanding of the factors influencing child feeding practices among rural caregivers in Rwanda.

Design: In-depth semi-structured qualitative interviews were conducted. Purposive sampling was used to recruit participants. Interviews were audio-recorded, transcribed verbatim and coded. Data were analysed inductively using thematic analysis.

Setting: Rutsiro District, Western Province, Rwanda.

Participants: Participants included twenty-four mothers (median age 32 years) with children 6–23 months old.

Results: We identified five key themes: (i) breast-feeding practices and role in food supply; (ii) family *v.* children's food preparations; (iii) food classification systems and their influence on child feeding decisions; (iv) child feeding during diarrhoeal episodes and (v) influence of poverty on child feeding practices and child care.

Conclusions: Mothers' infant and young child feeding decisions are informed by information both from health workers and from traditional/own knowledge. Navigating through this information sometimes creates conflicts which results in less than optimal child feeding. A nutrition educational approach that is cognisant of maternal perceptions should be employed to improve child feeding practices. Efforts to improve child feeding practices must be complemented by programmes that enhance household economic opportunities and access to foods.

Keywords
Child feeding
Perceptions
Undernutrition
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Rutsiro
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Undernutrition among children under 5 years of age remains a global public health concern. Globally, 150.8 million (22.2%) children under 5 years of age are stunted (i.e. low height-for-age)⁽¹⁾, a marker of chronic undernutrition. Chronic undernutrition in childhood increases risk of morbidity and mortality, impaired growth and cognitive development, poor school performance, reduced economic potential as well as the risk of chronic illness in adulthood. It has been estimated that undernutrition is associated with 45% of deaths among children under 5 years⁽²⁾, and more than 90% of these deaths occur in sub-Saharan Africa and South Asian countries.

Rwanda has significantly improved maternal and child health. The maternal mortality ratio fell from 1071 per

100 000 live births in 2000 to 210 per 100 000 live births in 2015⁽³⁾. Over the same period, under-five child mortality fell from 152 per 1000 live births in 2005 to 50 per 1000 live births. However, child undernutrition remains a serious public health concern in Rwanda. The most recent data from Rwanda estimated that 35% of children under 5 years of age are stunted⁽⁴⁾. Although the prevalence of undernutrition among Rwandan children under 5 years has declined over the past two decades from 48% in 2000⁽⁵⁾ to 35% in 2018⁽⁴⁾, the rate of reduction has not been enough to achieve the national targets of reducing stunting prevalence from 44% (2012) to 18% (2018)⁽⁶⁾. This calls for more efforts to reach the national nutrition targets.

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Evidence suggests that undernutrition in low-income countries, particularly in Africa and Asia, is linked to poor infant and young child feeding (IYCF) practices^(7,8). To improve child nutrition, the WHO recommends exclusive breast-feeding for the first 6 months, after which age-appropriate, safe, nutritionally adequate and responsive complementary feeding should commence^(9,10). In Rwanda, the prevalence of exclusive breast-feeding for the first 6 months is high (87%)⁽³⁾, but complementary feeding at 6–23 months remains sub-optimal. The national reports show that the number of children 6–23 months old who meet the recommended minimum acceptable diet in terms of sufficient diversity and frequency of feeding has remained the same between 2010 and 2018 (17%)^(3,4). This suggests gaps in optimal IYCF practices. Although poverty and food insecurity are often considered the main determinants of undernutrition⁽⁴⁾, studies in Rwanda⁽¹¹⁾, and elsewhere⁽¹²⁾, have reported high rates of child stunting even in the richest households. The authors suggested that cultural factors, inadequate knowledge and feeding behaviours could be limiting children from getting adequate diets⁽¹²⁾.

Past studies on the risk factors underlying child undernutrition in Rwanda have mainly focused on socio-economic and demographic factors^(13–16). Other studies^(17–19) examined the influence of access to health care on child stunting. These studies have used quantitative approaches that do not provide detailed information on IYCF practices from a local sociocultural context. While qualitative research on IYCF practices in Rwanda is limited, studies in other countries show that a qualitative approach can provide valuable insights on the drivers of IYCF practices which can help inform the development of more culturally relevant interventions^(20,21). A qualitative study conducted in one Rwandan district to explore the drivers of caregivers' food choices found that local perceptions about certain foods limited mothers from feeding children locally available foods⁽²²⁾. However, participants in that study were from urban and pre-urban populations whose feeding practices may not reflect the practices in rural areas where the majority of undernourished children live. The present study was thus designed to contribute to the limited information on IYCF practices in rural Rwanda. The primary objective of this study was to explore and gain in-depth of understanding of the factors influencing IYCF feeding practices in rural Rwanda from mothers' perspectives.

Methods

Setting

This study was conducted in Rutsiro District, Northwest of Rwanda, approximately 140 km from Rwandan capital city, Kigali. The Rutsiro district is one of Rwanda's rural districts with the highest prevalence of child stunting (54%) among children under 5 years⁽⁴⁾. The district population is largely

rural (approximately 98%), and subsistence farming and traditional rearing of animals are the primary livelihood activities⁽²³⁾. The main subsistence crops are maize, beans, banana plantain, cassava, sweet and Irish potatoes. Data from national statistics show that 51.4% of the district population are poor and 24% live in extreme poverty (i.e. the poorest)⁽²⁴⁾. Administratively, Rutsiro district is divided into thirteen sectors. Each sector is divided into cells, and each cell is divided into villages (a village is the lowest administrative unit in Rwanda). This study was conducted in Gihango sector from December 2017 to January 2018. Gihango sector was selected based on the study objectives. Although the sector was deemed to have a relatively good crop diversity compared with other sectors, it was the sector with the second highest number of children under 5 years of age with acute malnutrition (at the time the study was conducted). Additionally, the sector was accessible to the researcher.

Study design

This study was intended to be descriptive and exploratory. A descriptive qualitative methodology was used to explore IYCF practices among mothers. The study was conceptualised within the context of high prevalence of child undernutrition and inadequate IYCF practices among children 6–24 months in Rwanda. The study design draws from a bio-cultural model⁽²⁵⁾, which focuses on physical, socio-economic and cultural environments that influence child feeding.

Participant selection and sample size

The selection of participants was designed to capture information-rich cases in order to obtain in-depth understanding of IYCF practices⁽²⁶⁾. A purposeful sample of twenty-four mothers with children 6–24 months old were identified in four villages using lists of eligible mothers compiled from growth monitoring records with the assistance of the village community health workers. Mothers were eligible if: (1) they had a child aged 6–24 months old; (2) had lived in the area for at least 6 months; (3) their child was apparently healthy and (4) the mother was in the first or second lowest socio-economic group as per the Rwandan government classification. Approximately half of the eligible mothers from each list were selected. As we aimed for diverse perspectives on IYCF practices, attempts were made to include young and older mothers with children at different age stages. The interviewer approached the mothers to explain the aim of the study, confirm eligibility and invite her to participate in the study. Two mothers were not at home; all mothers spoken to agreed to participate. Recruitment ceased when data saturation had been reached, that is, no new information was generated⁽²⁷⁾.

Data collection

Data were collected through in-depth interviews using a semi-structured interview guide. The guide consisted of a

set of open and closed questions, and the major topics covered were: (i) child feeding practices, including breastfeeding, complementary feeding and type of foods given/not given to young children and reasons for these choices, (ii) challenges related to child feeding, (iii) health practices and (iv) child care arrangements. To ensure clarity of the questions, community health workers from the study settings and a Rwandan nutritionist were consulted during the development of the interview guide. The interview guide was first developed in English, translated into Kinyarwanda (the local language) and then back translated into English by a Rwandan nutritionist. The final Kinyarwanda version was refined after back translation to maintain the original English meaning. Prior to data collection, the interview guide was pre-tested with six women from another community and adjustments were made accordingly. Interviews were conducted by the first author, who is fluent in Kinyarwanda, and had prior experience in qualitative research methods and data collection in rural Rwanda. Interviews were conducted in the participants' homes. To ensure confidentiality, the data were anonymised by assigning an identification number to each record, transcript and field notes. Each interview lasted 30–60 min and was audio-recorded. During the interview, specific questions or probes were asked to the mothers to seek further clarifications if necessary⁽²⁸⁾. Field notes were also taken and later used for data triangulation. The notes also provided a means to clarify the interviewer's thoughts, which helped to minimise the bias during data analysis⁽²⁹⁾. The authors held online meetings throughout the data collection to review preliminary findings. These meetings allowed us to review questions at the time of data collection and to develop new aspects of the questions⁽³⁰⁾.

Data analysis

The recorded interviews were transcribed verbatim in Kinyarwanda and then translated into English. Transcripts were checked against the interview records and triangulated with field notes taken during each interview. The data were manually coded by the first author (T.D.). Analysis was performed inductively following the steps outlined by Braun and Clarke⁽³¹⁾ for thematic analysis. Briefly, the first author read all the transcripts multiple times to familiarise himself with the data. An initial list of descriptive codes and relevant quotes pertaining each code was generated from a subsample of transcripts ($n = 5$). The codes were then reviewed and discussed by the three authors (T.D., L.B. and J.L.W.). Final codes were agreed upon, which were applied to all subsequent transcripts. New codes that emerged from the subsequent transcripts were integrated into the final list of codes. Final codes were reviewed again, organised in a table, grouped into categories and then into themes using a pattern and focused coding method⁽³²⁾. Quantitative data including demographic characteristics were analysed using

Microsoft Excel. In presenting the data, relevant verbatim quotes were used to aid data interpretation. Methods and findings are reported as per the consolidated criteria for reporting qualitative research (COREQ) checklist (see supplementary material)⁽³³⁾.

Results

Participants and sample characteristics

Mean age of our study respondents was 30 years (range 24–42) (Table 1). Mean age of children was 16 months (range 6–22). Eighty-three percentage ($n = 20$) were married. The median household size was 5 (range 3–9); about a half ($n = 10$) had two or three children under 5 years old. Self-reported child illnesses in the previous 2 weeks included diarrhoea (50%), fever (33%) and other illness (58%) (e.g. respiratory infections, eye and skin infections). All children had received all vaccines appropriate for their age.

Table 1. Characteristics of mothers and children ($n = 24$) interviewed in the present qualitative study on infants and young child feeding practices in Gihango sector, Rutsiro District, Rwanda, December 2017–January 2018

Characteristics	Mean	SD	<i>n</i>	%
Child's age (months)	16.1	4.7		
Mother's age (years)	30.5	5.0		
Household size	4.8	1.6		
Child's age group				
6–11 months			6	25
12–17 months			8	33
18–22 months			10	42
Child's sex				
Female			15	63
Males			9	37
Child's illness in the past 2 weeks				
Diarrhoea			12	50
Fever			8	33
Other illnesses			14	58
Mother's age group				
≤25 years			3	12
26–30 years			6	25
31–34 years			6	25
≥35 years			9	37
No. of children (parity)				
1 child			7	29
2–3 children			11	46
4–5 children			6	25
Marital status				
Married			20	83
Unmarried			4	17
Mother's education				
None			3	13
Some primary			20	83
Some secondary			1	4
Health seeking practices				
Possession of community-based health insurance			20	83
Child fully immunised			24	100
Child taken to growth monitoring (last month)			18	75

**Breast-feeding practices and role in the food supply**

Nearly all mothers reported that they exclusively breastfed for the first 6 months. Only two mothers reported giving their children foods before 6 months, but they pointed out that giving child foods before 6 months was contrary to the recommendations. Our data indicate that mothers knew the recommended age for introduction of complementary foods. Breast-feeding is regarded as a child's rights, a sign of love and a way to improve mother–child emotional bond, in addition to source of nutrition/goodness.

Prolonged breast-feeding is also a strategy to deal with anxiety experienced by some mothers who have insufficient food to feed their children. One mother with five children explained her choice to reserve food for the older non-breastfed child because the youngest child had a back-up option – the breast milk.

If possible, she will breastfeed until 4 years. You cannot refuse to breastfeed a child. Breastmilk has something that is beneficial for child. And for us who are poor, even if you don't have foods but breastfeed your child, the child feels that you are closer, which creates and maintain good relationship between you and your child. **Participant 12, 38 years, child 11 months.**

She [youngest child] eats when there is enough food. Because, as a mother, you tell yourself, at least she will get something from her mother's breasts. So, the little food that is there is reserved for her older sibling. **Participant 11, 35 years, child 14 months.**

Most mothers mentioned that their children started receiving foods or fluids other than breast milk between 6 and 7 months. The first and most common complementary food reported by all mothers was thin porridge. Sorghum flour is most commonly used to make the porridge. Mothers desired to give their children a more nutritious porridge made from a commercial mixed-grain cereal flour (locally known as SOSOMA), and they knew ingredients such as soya flour and milk could be used to prepare a nutritious porridge for their children. However, many mothers said that SOSOMA and most of these ingredients were not affordable. At around 8 months, children start to receive modified family foods. Fruits, biscuits and Irish potatoes are the foods that are procured specifically for young children.

Family v. children's food preparations

We engaged mothers in discussion about how they prepared foods for their family and children. Mothers first described how they prepared family meals, and then how these foods were fed to young children. The narratives indicate that a typical family meal usually contains two major components: (i) a staple/starchy component (e.g. cassava, sweet potatoes and taro) and (ii) a legume (often beans) and/or vegetables. The two components are usually boiled in one pot in a mixed dish – locally

known as *'imvange'*. When cooked separately, the starchy component is often served with a stew/sauce made from vegetables and/or beans. Sometimes, groundnut powder is added to flavour the stew/sauce. Mothers with economic means buy small dried fish (*indagara*), soya flour and cooking oil to add to the stew/sauce. The narratives suggest that, regardless of whether the two components were cooked together or separately, the starchy component is viewed as adult foods and may not be given to young children below 2 years because it is considered too 'hard' for them. Instead, children are given vegetables (except cabbage), porridge, beans, sauces or stews. If the starchy component was ever fed to the child, the child would be given a trivial amount. Irish potatoes are an exception because they can be easily mashed into soft foods.

When I have cooked cassava and beans in a mixed dish for us adults, I also have to look for vegetables. I cook them together, and then I mash these vegetables and beans to feed her. Normally a child like this should eat soft foods. If there are no beans, we add [to the family pot] some vegetables for her. **Participant 5, 42 years, child 21 months.**

When we [adults] eat sweet potatoes, he [child] eats vegetables and tops up with porridge. **Participant 8, 39 years, child 17 months.**

Mothers are encouraged by health professionals to have a side pot (locally known as *agakono k'umwana*) for young children⁽³⁴⁾. We asked mothers about this practice. Our data suggest that the practice is not a common practice. Rather, the preparation of children's foods in a side pot is used as a compensatory mechanism when the child was sick or has lost weight.

I usually prepare her food in a side pot when she isn't in a good health. When she is well, I cook all the food in one [family] pot. I know she is not well when I take her to the growth monitoring site and they tell me that she lost weight. **Participant 18, 32 years, child 19 months.**

Food classification systems and their influence on child feeding decisions

Mothers had two distinct food classification systems that influence their feeding decisions. In the first classification system, mothers classified foods into three broad categories based on what nutrients the foods bring to the body. In their narratives, over three quarters of the mothers use the 'balanced diet' concept to refer to a meal that contains the three categories of foods: *'body building foods'*, *'energy foods'* and *'disease protective foods.'* Some mothers said that a balanced diet provides vitamins, while others gave reasons why it was important to feed their children a balanced diet: 'so that a child gets all nutrients.'

Well, they teach us that a child should be given body building foods, disease protective foods and energy



foods. Vegetables are disease protective; Irish potatoes are among the starchy foods and I know that milk is also good for a child. Banana is also important.

Participant 3, 24 years, child 18 months.

In the second classification system, mothers classified foods into three categories, namely *hard*, *soft* and *oily/fatty foods* primarily based on physical characteristics. Foods such as cassava, sweet potatoes, maize grains, banana plantain and taro are referred to as *hard foods* and therefore not suitable for children below 2 years of age. Mothers also described *soft foods* as foods with a soft or watery consistency such as thin porridge or vegetables (except cabbage), cassava leaves, sauces and stews. Other foods were referred to as *oily foods* because they are regarded as containing oil. Examples of *oily foods* included cow's milk, avocado, vegetable cooking oil and two flours – groundnut flour and soya flour – that might seem at first to be surprising candidates for inclusion in the oily food category.

In their narratives, mothers made statements which suggested conflicts between the two classification systems.

Sweet potatoes and taro are things you can't give your child. In my opinion, sweet potatoes and taro are foods that provide energy for adults. But children can get that energy from vegetables and some other supplementary foods. Those other foods [sweet potatoes/taro] are for adults. **Participant 6, 28 years, child 18 months**

Hard foods are like cassava and sweet potatoes. Would you say that your child has eaten when you have fed him/her sweet potato? No, it does not contain any nutrients. Perhaps if you have peeled it, added some vegetables... that is when you can say: I have fed my child a balanced meal. **Participant 2, 33 years, child 7 months.**

A child is not eating well... that means feeding her unbalanced diet. Like giving her those energy foods while she is still young and yet those kinds of foods provide her with nothing that can help her body. **Participant 10, 32 years, child 15 months**

Contrary to the *hard foods*, mothers had a strong preference for feeding *soft foods* and they considered these foods as the most suitable for young children.

She [child] cannot eat cassava. This one needs soft foods. It is because she does not have teeth to chew cassava. **Participant 1, 35 years, child 13 months.**

When we are lucky and manage to get sweet potatoes, because it is a hard food and she cannot eat it, she just breastfeeds, or we give her some vegetables. **Participant 4, 25 years, child 16 months.**

A few mothers said that preparing *hard foods* in a different way would allow the child to eat these foods.

Cassava...? Yes, it is also possible. You can chop them, add some vegetables, but then you need to make the food very soft. What is bad is cooking them in a mixed dish like we usually do, and just feed the child like that. When they [cassava] are soft, I think there is no problem. **Participant 2, 33 years, child 7 months.**

While soft foods are considered the most suitable for young children, these foods have a watery consistency that, according to some mothers, makes them unsuitable to mix with the micronutrients sprinkles which mothers receive through the home fortification programme. Some mothers felt it was against the recommendations if they added micronutrients sprinkles (*Ongera*) to the soups and stews that they usually feed their children.

There are even something called *Ongera* that they give us. We add it to foods that are not hot. But we don't add it to those soft foods like soups. They told us that we must not mix *Ongera* with soft foods. **Participant 3, 24 years, child 18 months.**

Child feeding during diarrhoeal episodes

If you take your child to health centre every time she/he has diarrhoea, then you will spend your whole life at the health centre. **Participant 11, 35 years, child 14 months.**

This statement illustrates how frequently children from the study area are experiencing diarrhoea. Some mothers mentioned that diarrhoea lasted several days up to a week. There was a common belief among participants that eating sweet potatoes causes worms – a term which is also used to denote diarrhoea. Other mothers attributed diarrhoea to child developmental stages such as child learning to walk, stand alone or teething. While *soft* and *oily foods* are the most preferred food for young children, many mothers avoid these foods when their children have diarrhoea because of the perceptions that these foods loosen stools and worsen diarrhoea.

When she has diarrhoea, I don't give foods with a lot of soup... Foods mixed with groundnut or soya flour. I can't even give her milk. It is because those foods contain a lot of oil. Those foods loosen stools and increase diarrhoea. Diarrhoea is not oil friendly. **Participant 21, 30 years, child 10 months**

Normally sweet potatoes cause worms (diarrhoea). Even us adults, when you eat them two times, the worms get activated. So, if you keep feeding your child sweet potatoes, the child will end up malnourished. **Participant 8, 39 years, child 17 months.**



They [community health workers] warned me saying that sweet potatoes cause *'bwaki'* (malnutrition).

Participant 18, 32 years, child 19 months.

Instead, some mothers feed their children thick foods in attempt to stop diarrhoea.

When a child has diarrhoea, I just stop those soft foods that I usually give him. I stop them and give him thick foods. I try to cook for him *Mazizi* and *Kamara* [green banana varieties]. When I do that, diarrhoea stops. I don't know how this works, but I guess they [green banana] are not quick to get out of the body.

Participant 11, 35 years, child 14 months.

Influence of poverty on child feeding practices and child care

Poverty and lack of employment opportunities were mentioned by many of the mothers as the main challenges faced by the mothers in their feeding practices. Most mothers highlighted that these challenges translated into lack of nutritious foods and fewer meals for their children. Less than a half of the mothers mentioned that they could afford three meals a day, while others mentioned providing one or two meals a day.

Honestly I can't lie; many times they [children] spend the whole day without eating. I wake up in the morning and then go work for food. So, they eat when I am back in the evening. **Participant 18, 32 years, child 19 months.**

The narratives indicate that, poverty not only limits mothers' access to foods, but it also has an impact on other aspects of childcare. For example, some mothers mentioned that chances to get a farm employment are limited for a breast-feeding mother. Thus, to increase chance to get a job, some mothers leave their children under the care of young siblings, though they doubted their caregiving capacity.

When you find a job at the road construction site, you just leave the child with her older siblings. But when you are back, you may find that they [older siblings] have eaten the food you left for the child. And you get back feeling tired and not even being able to take care for the child. **Participant 10, 32 years, child 14 months.**

Discussion

In many cultures, child feeding decisions are taken by mothers⁽³⁵⁾ and most of these decisions result from complex interactions between many factors, including mothers' cultural beliefs and perceptions, resources and support available to the mothers as well as child health status and characteristics^(36,37). Understanding these factors in a local context is a key step towards improving complementary feeding practices⁽²⁰⁾.

Our results show that mothers have a good understanding of and positive attitude towards exclusive breast-feeding for the first 6 months. Mothers also believed that a child should be breastfed together with complementary feeding for as long as possible. The prevalence of exclusive breast-feeding up to 6 months is high in Rwanda (87 %)⁽³⁾. The benefits of breast-feeding on maternal and child health outcomes are well documented^(38,39). Thus, the positive attitudes of mothers about exclusive breast-feeding present an opportunity to promote and sustain child breast-feeding in Rutsiro District. However, further investigation is warranted to assess if the positive attitude towards breast-feeding results from lack of adequate food resources.

In this study, we found that mothers have two systems of food classification which influence their feeding decisions. The first classification system, by which mothers classify foods into three categories: 'energy foods', 'body building foods' and 'disease protective foods', is widely used by health professionals in Rwanda⁽⁴⁰⁾ to teach caregivers child feeding. This suggests that mothers had been exposed to and learned nutrition messages. The second classification system reflected mothers' perceptions about the ability of young children to eat the foods or the perceived effects of the food on children's health especially in the presence of diarrhoea. This finding is supported by earlier studies⁽⁴¹⁻⁴³⁾ showing that caregivers in different contexts and cultures classify food differently and that child feeding is conceptualised around caregivers' food classification systems⁽⁴³⁾.

In relation to child feeding, our data indicate a disconnect between the two classification systems used by mothers. While mothers frequently used the concept of 'balanced diet' to suggest diet diversity, conflicting beliefs were identified. For example, some mothers viewed starchy staples (classified under energy foods category) as adult foods, while others doubted whether these staples have nutrients that are beneficial for young children. We found that child feeding decisions are largely influenced by the mothers' traditional/own knowledge about foods and their suitability to young children. These findings suggest that young children may be deprived or given insufficient amount of staple foods such as cassava, sweet potatoes and green banana, and hence limiting children's dietary diversity and energy intake. It is logical if mothers do not provide children with foods that they perceive to be harmful. However, where these decisions are based on misperceptions, it calls for an improved effort to address alternative beliefs held by mothers.

While studies on maternal perceptions and beliefs around IYCF practices are limited in Rwanda, studies from other African countries have documented maternal and cultural perceptions that limited children from consuming locally available foods. For example, in Ethiopia, it was found that vegetables and meat or other animal source foods were not given to young children due to the



perceptions that they are difficult to digest and cause stomach illness⁽⁴⁴⁾. Paul *et al.*⁽⁴⁵⁾ also found that, in Tanzania, children were not given fish because of the perceptions by mothers that fish cause tooth decay. In the present study, a few mothers felt that changes in how cassava or sweet potatoes are traditionally prepared could allow children to eat these staples. Possibly, these mothers fed children with these foods. In a previous study conducted in Nyanza district, South province of Rwanda, Lee *et al.*⁽²²⁾ found that although their study households ($n = 28$, child age range: 10–47 months) had purchased and eaten sweet potato several times in the past 7 d, sweet potato was completely absent from the 24-h recall of their children's diet. In the present study, a few mothers felt that changes in how cassava or sweet potatoes are traditionally prepared could allow children to eat these staples. Possibly, these mothers fed children with these foods. Thus, if mothers are to maximise the diets of their children using foods that are within their reach, nutrition educators should work with mothers to identify acceptable methods of food preparations that can be used to prepare staple foods in a way that is appropriate for young children.

We also explored mothers' feeding practices during diarrhoea. Research shows that mothers adopt different care practices due to beliefs about children's illness, with implications on child's nutrition⁽³⁷⁾. In the present study, we found that mothers have a strong preference for soft/thin foods in the absence of diarrhoea because of the perceptions that young children up to 2 years cannot eat hard foods. In the presence of diarrhoea, mothers avoid soft foods because of perceived adverse effects of these foods on child diarrhoea. In the context of the study setting where diarrhoea may be common in children, avoidance of foods during diarrhoea is likely to reduce children's food intake^(46,47) and to precipitate nutritional deficiencies^(48,49). Interestingly, some mothers reported preparing thick foods (e.g. thick porridges) for children with diarrhoea and two of them reported using oral rehydration solution in attempt to stop diarrhoea. Our findings encourage further research to better understand the practices and motivations of mothers who adopt positive practices during child illness. Once these are understood and trialled, it could help in formulating clear nutrition educational messages that promote existing positive practices⁽⁵⁰⁾.

Our findings also suggest that current feeding practices have implications for other nutrition programmes. For example, in Rwanda, caregivers with children 6–23 months receive micronutrient sprinkles (locally known as Ongera) as part of the government's home fortification programme to prevent stunting and anaemia. Caregivers are expected to add these micronutrients to children's semi-solid or solid foods before consumption^(34,51). The instructions of using the micronutrients sprinkles are that mothers should mix the product with semi-solid or solid foods⁽³⁴⁾. However,

mothers considered the consistency of complementary foods that they usually feed their children was inappropriate to mix with the micronutrients, suggesting that the children may not be receiving the recommended dose of the micronutrients. Moreover, the widely held belief that sweet potato is not suitable for young children is likely to interfere with the consumption of the vitamin-A-rich sweet potato variety that is currently being promoted in Rwanda⁽⁵²⁾. Thus, our findings underline the importance of understanding local contexts in which nutrition programmes take place.

Finally, poverty and food insecurity appeared to be significant barriers to appropriate child feeding practices. This may not be surprising given the high level of household poverty (51.4%)⁽²⁴⁾ and food insecurity (49%) in Rutsiro district⁽⁴⁾. As stated above, mothers expressed how poverty and food insecurity impacted their feeding practices and child care through: (1) reduced number of meals received by children; (2) inability for mothers to procure the ingredients required to prepare nutritious foods for their children; (3) breast-feeding younger children as a means to maximise foods for other household members, but limiting the complementary foods recommended in this age group's diet; (4) trade-offs involved between finding employment and child care and (5) inability of mothers to implement nutrition advice from health workers (e.g. having a side pot of nutritious foods (*agakono k'umwana*) for young children). Some studies suggest that maternal education or behaviour change communication strategies, with or without foods, can improve IYCF practices⁽⁵³⁾. However, other researchers argue that such strategies must be part of more comprehensive approaches that address contextual factors such as poverty and food insecurity⁽⁵⁴⁾. The government of Rwanda has been implementing various social protection programmes targeting the most vulnerable households to enable them purchase more nutritious foods⁽⁵⁵⁾. Research shows that, if implemented adequately, these programmes represent important opportunities for supporting caregivers' ability to care for their children⁽⁵⁶⁾. Additional efforts to enhance economic opportunities and access to foods by caregivers in Rutsiro should be explored.

The strength of the present study lies in its qualitative approach, which allowed us to gain a deeper understanding of IYCF practices and mothers' rationale within the socio-cultural context. This information is often not captured in quantitative surveys. However, there are limitations to this study. First, our findings are based on a purposive sample recruited from one sector in Rutsiro District, which may limit the transferability to populations outside this area. However, we included mothers whose children were at different age stages and that represented a wide range of maternal age and parity in order to obtain a rich data set, which is prerequisite for the nature of the study⁽²⁶⁾. Second, the interpretation of our findings must consider that we did not collect dietary data. Third, social desirability



bias may have influenced the participants' responses (e.g. breast-feeding practices) or participants may have overemphasised the influence of poverty and food insecurity on child feeding. Mothers were encouraged to answer questions based on their own experiences. The interviewer also emphasised that there was no right or wrong answer and promised confidentiality. Finally, we acknowledge that interviewer's gender (male) is a potential limitation in interviewing mothers. However, in Rwanda, mothers are used to interact with community health workers (both males and females) who provide them with nutrition education, and we have no prior evidence or perception that mothers in this area were hesitant to speak with a male. Moreover, the interviewer took care to establish good rapport with the participants through courteous behaviour.

Conclusions

The findings from this study showed that mothers have positive attitudes towards breast-feeding and a good understanding of its health benefits. However, sub-optimal complementary feeding practices may result from the complex beliefs, perceptions and food classification systems which appear to have a strong influence on mothers' feeding decisions; this is in spite of the mothers appearing to have some nutrition knowledge received from nutrition counselling on IYCF. The views identified in this study, that certain foods are (un) suitable for young children, or that certain foods must be avoided during child diarrhoea, are likely to negatively affect the diversity and the amount of foods received by children. If these views are not recognised, the current nutrition education will not be effective in improving IYCF practices. We recommend further research to examine to which extent the beliefs, perceptions and food classification systems are shared with mothers in other districts of Rwanda. Such research could inform the design of culturally relevant interventions to improve IYCF practices. In addition, there is a need to support mothers and caregivers through improving household income and access to foods so that they can implement recommendations.

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Supplementary material

For supplementary material accompanying this paper visit <https://doi.org/10.1017/S1368980020001081>

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