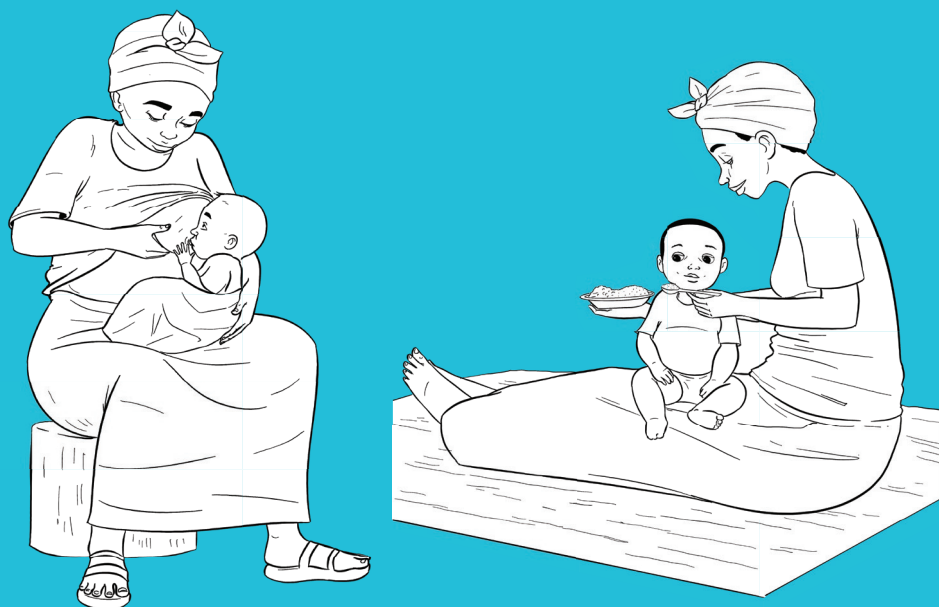


Understanding the psychological and social environmental determinants driving infant and young child feeding practices among Rwandan households:

a salutogenic approach



Jeanine Ahishakiye

Propositions

1. Although the knowledge level about infant and young child feeding recommendations is not a big problem for healthy feeding practices in Rwanda, it is also not a big solution. (*this thesis*)
2. Repeated positive experiences with appropriate infant and young child feeding practices during childhood strengthen the use of these practices for the next generation. (*this thesis*)
3. Social distancing is a breakdown of social capital.
4. Information Communication Technology (ICT) supports economic development but does not address economic inequality.
5. Natural disasters exacerbate poverty while further enriching the wealthiest.
6. A supportive social environment is worth hundred books read during a PhD research journey away from home.

Propositions belonging to the thesis entitled

Understanding the psychological and social environmental determinants driving infant and young child feeding practices among Rwandan households: a salutogenic approach

Jeanine Ahishakiye

Wageningen, 8 September 2020

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Thesis

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Chapter 1

General introduction

Undernutrition

Globally, it has been estimated that 5.3 million children under the age of five died in 2018 [1]. Nearly half of all deaths among children under five years of age are attributed to undernutrition [2]. Stunting is one of the most prevalent forms of child undernutrition in developing countries [3]. Stunting is defined as having a height-for-age z- score (HAZ) that is less than minus two standard deviations below the median of the World Health organization (WHO) growth standards [4]. Despite reductions in stunting prevalence between 2000 and 2018, it has been estimated that 149 million children under 5 years of age were stunted globally in 2018 [5]. Africa was the only region that has recorded an increase in the number of under five stunted children, from 50.3 million in 2000 to 58.8 million in 2018 [5]. Among African regions, stunting among children under five years of age was highest within countries in East Africa with an estimated prevalence of 35.2% in 2018 [5]. These figures position stunting as a significant public health concern in the world in general and in Eastern Africa countries in particular. According to UNICEF conceptual framework, undernutrition among children is associated with short and long term consequences [6]. Short term consequences associated with undernutrition in children include mortality, morbidity and disability [6, 7]. Long term consequences include cognitive and developmental impairments that have consequences for their own individual productivity and well as community and national productivity in adulthood [6, 7].

Undernutrition in children (stunting) is a complex phenomenon that stems from various underlying determinants, including lack of optimal infant and young child feeding (IYCF) practices [8]. Optimal IYCF practices including the initiation of breastfeeding within one hour of birth, exclusive breastfeeding (EB) for 6 months, followed by nutritionally adequate and safe complementary foods while breastfeeding continues for up to two years or beyond all have great potential for reducing malnutrition among under five children [9, 10]. Breastfeeding is associated with positive health outcomes for both the mothers and babies and is crucial to a healthy start in life. EB for 6 months provides nutrients, vitamins and minerals an infant needs for growth in the first 6 months and promotes bonding between mother and child [11]. EB has beneficial effects on cognitive development of children [12]. Breastfeeding also contributes to maternal health because it might reduce the risk of ovarian and breast cancer in mothers [11]. However, any protective effect conferred by EB does not overcome the adverse factors that affect children if they do not receive an adequate quantity and quality of complementary foods after 6 months of age [13]. Despite widespread consensus regarding the benefits of optimal infant feeding practices in the

critical window from birth to 2 years, very few infants in developing countries are fed appropriately [14, 15]. Globally, it has been estimated that only 42% of new born were put to the breast within the first hour after birth, 41% of babies between 0–5 months were exclusively breastfed for 6 months in 2017 [15]. As for complementary feeding, 69% of children were introduced to solids between 6–8 months, with 51% and 25% of children between 6–23 months having fed the minimum number of times and meeting the minimum dietary diversity¹ respectively. Only 16% of children between 6–23 months received the minimum acceptable diet in 2017. In East and Southern Africa respectively, 65% and 56% of children were put to the breast within one hour after birth and were exclusively breastfed, while 42%, 21% and 11% of children between 6–23 months were respectively introduced to solids (6–8 months), with a minimum meal frequency², minimum dietary diversity and minimum acceptable diet³ (6–23 months). These estimates indicate significant room for improvement in infant and young child feeding [15].

A healthy start in life through optimal infant feeding practices is critical to achieving the World Health Assembly's first global nutrition target of 40% reduction in the number of stunted children under five by 2025 in addition to achieving many of the Sustainable Developments Goals (SDGs). For instance, breastfeeding supports SDG 2 “end hunger, achieve food security and improved nutrition and promote sustainable agriculture” and SDG 3 “ensure healthy lives and promote wellbeing for all at all ages”. In addition, breastfeeding and quality complementary feeding give every child a fair start on life and contribute to cognitive development and capacity to learn and future development into adults who are productive members of their communities and this has implications for SDG 4 “ensure inclusive and equitable quality education and promote lifelong learning opportunities for all”.

¹ Minimum dietary diversity: Proportion of children 6–23 months of age who receive foods from 4 or more food groups from the seven recommended food groups, namely: grains, roots and tubers, legumes and nuts, daily products, flesh foods (meat, fish, poultry, liver/organ meats), eggs, vitamin A-rich fruits and vegetables during the previous 24 hours.

² Minimum meal frequency: Proportion of breastfed and non-breastfed children 6–23 months of age who receive solid, semi-solid, or soft foods (but also including milk feeds for non-breastfed children) the minimum number of times or more, that is, 2 or more (at age 6–8 months), 3 or more (at age 9–23 months) solid, semi solid or soft foods for breastfeeding children, or 4 or more solid or semi solid or milk feeds for non- breastfeeding children at age 6–23 months during the previous 24 hours.

³ Minimum acceptable diet: Proportion of children 6–23 months of age who receive a minimum acceptable diet, both the minimum dietary diversity and the minimum meal frequency during the previous 24 hours.

Child undernutrition and infant and young child feeding practices in Rwanda

Child undernutrition, especially stunting remains a public health concern in Rwanda as opposed to other forms of malnutrition including wasting and underweight. Despite the Government efforts to reduce the prevalence of stunting, the reduction in stunting from 44% in 2010 to 38% in 2015 is limited [16]. Stunting is still considered a major challenge to overall economic development in Rwanda, particularly among children living in the poorest households (49% stunted) and children living in rural areas (41% stunted) [17]. Stunting affects 21% of children before their first year anniversary and increases dramatically to 49% of children between 18 and 23 months [17]. With this pace the reduction is less likely to achieve the World Health Assembly's target of reducing the prevalence of stunting by 40% before the year 2025. This suggests that the government, policy makers and researchers need to search for effective initiatives to sustain the progress and accelerate the rate of stunting reduction.

According to Rwanda Demographic and Health Survey (RDHS) 2014–2015, 81% of children are breastfed within one hour of birth and 87% of children younger than age 6 months are exclusively breastfed [17]. However, the percentage of young children who are exclusively breastfed decreases sharply from 94% among infants age 0–1 month to 90% among those age 2–3 months and 81% among those age 4–5 months [17]. Among all children aged 6–23 months, less than half (47%) are fed at least the minimum number of times and 30% are fed according to minimum standards with respect to food diversity (four or more out of seven food groups). Overall, only 18 percent of children aged 6–23 months living with their mothers are fed in accordance with all three recommended IYCF practices [17]. Poor feeding practices are therefore a major threat to attaining and maintaining good nutritional status and health of children below two years old in Rwanda and require more attention. Previous studies have shown that suboptimal breastfeeding practices including late initiation of breastfeeding, lack of EB in the first 6 months, are risk factors for stunted growth among Rwandan children under the age of five years [18, 19]. Inadequate breastfeeding practices including late initiation and non-exclusive breastfeeding hold back the adequate intake of energy and nutrients from breastmilk [20]. In turn, inadequate intake of energy and nutrients from breastmilk increases the child's exposure to undernutrition and mortality, which in the end may lead to stunted growth [21]. Existing research also recognizes the critical role of inadequate complementary feeding in the origin and progression of stunted growth [22]. Previous studies in Rwanda have indicated that the likelihood of being stunted was higher among children who started complementary food before the recommended age

of 6 months [18]. Furthermore, various studies have identified factors that contribute to suboptimal IYCF practices in Rwanda. These include economic factors (e.g. lack of money to buy appropriate food due to poverty leading to household food insecurity), social factors (e.g. family members or peer influences to introduce food early, lack of support from community for optimal IYCF, marital abuse), maternal perception of inadequate breastmilk, mothers' heavy workload and family demands, health status of the mother or the baby [16, 19, 23].

Most studies on child stunting apply a biomedical orientation that is focusing on nutritional-physiological determinants of stunting such as timing, composition, and frequency of IYCF. Although highly relevant, it is also important to recognize the multiple and dynamic realities in which the individuals live and to examine the broader social determinants of IYCF practices. Dietary behaviors, for instance IYCF practices, are learnt, supported and expressed through an expansive social environment [24]. The social environment facilitates or inhibits IYCF practices and choices that are made. Therefore, the social embeddedness of IYCF requires an additional focus.

Another omission in research on child malnutrition (stunting) is that most studies have a pathogenic orientation, looking at the factors underlying stunting (the risk factors for childhood stunting). Insights from a risk-oriented approach (determinants of failure) are relevant to inform strategies for disease curation and prevention. However, an additional focus on the factors underlying good nutritional status (determinants of success) should be added to inform strategies enabling health. For instance, paying attention to resources mothers identify and how they use them to overcome IYCF challenges in the context of their daily lives have very often been ignored.

We argue that, it is vitally important to understand the nutritional physiological determinants of stunting (pathogenic orientation) and the risk factors for stunting, with a focus on IYCF practices. Yet, it is also imperative to examine the broader social determinants of IYCF with emphasis on both individual and social environmental factors that contribute to healthy IYCF practices. We therefore also argue in favour of a complementary approach that will add to the dominant pathogenic risk-oriented approach, with a contextualized, resource-oriented approach relevant and, applicable to people's everyday life.

The research presented in this thesis took up the afore-mentioned omission in research by focusing on how IYCF practices are shaped within the everyday life of the mothers, with attention to the individual and contextual level resources that facilitate IYCF practices.

Theoretical framework: The Salutogenic model of health

The salutogenic model of health (SMH), introduced by Antonovsky (1979), centralizes the question on ‘what creates health rather than only what causes diseases’ [25]. It takes a life course perspective and uses the everyday social context as a starting point to understand how people cope with stressors [26]. The salutogenic perspective focuses on how health is developed through resources found within peoples themselves and their everyday life context rather than studying individual health separate from the physical and social context. In the salutogenic model, health is seen as a continuum with complete (positive) health at one extreme and total absence of health at the other (**Figure 1.1**) [27]. This continuum is also called “the ease-disease continuum”. Under the theory, the health state of people oscillates along this continuum throughout their lives [27]. Along the life-course, people are positioned somewhere on this continuum and are confronted by challenges/stressors in their everyday life that they have to deal with [25]. Stressors are omnipresent, as inherent parts of everyday life and are inevitable. Stressors have the potential to upset people’s position and cause tension. When people can successfully manage the stressors, they maintain their health status or move towards the ease end of the continuum. On the contrary, people who are unable to manage the stressors will move towards the dis-ease end of the continuum [25, 27].

The SMH has two key constructs: The General Resistance Resources (GRRs) and the Sense of Coherence (SOC), both of which are important in coping with stressors. The GRRs can be found within people as resources bound to their person and capacity but also to their immediate and distant environment as both material and non-material

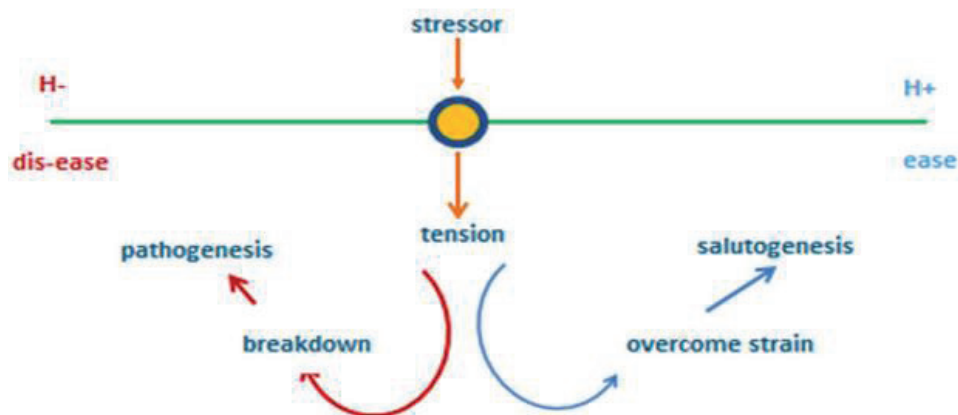


Figure 1.1: The ease-disease continuum of the salutogenic model of health (source: The Hitchhiker's guide to Salutogenesis [28]).

qualities from the person to the whole society that facilitate the people's abilities to cope with stressors [25, 29]. Examples of GRRs are knowledge, intelligence, emotion, control, social support, commitment, cultural stability, belief religion but also material resources such as money [27]. GRRs arise from the cultural, social and environmental living conditions and early childhood upbringing, and socialization experiences [29]. If people can identify such resources in themselves or in their immediate surroundings at their disposal there is a better chance for them to deal successfully with the challenges of life. GRRs open up the possibility for people to construct coherent life experiences [30]. More important than the resources themselves, is the individual's ability or capacity to recognize, use and re-use the resources in a health promoting way. This is the meaning of the second salutogenic key concept: the SOC. The SOC is defined as "a global orientation that expresses the extent to which one has a pervasive, enduring though dynamic feeling of confidence that 1) the stimulus from one's internal and external environment in the course of living are structured, predictable and explicable 2) the resources are available to one to meet the demands posed by these stimuli; and 3) these stimuli, and these demands are challenges, worthy of investment and engagement" [27]. Three dimensions form the SOC. The first dimension is *Comprehensibility*. It is the cognitive component of the SOC and refers to the extent to which the information received from the environment is clear, structured and makes sense. It is the degree to which someone understands the challenge of coping with stressors. The second dimension is *Manageability*. It is the behavioral component of the SOC and refers to the extent to which the person believes the resources needed to cope with stressors are at his or her disposition. The last dimension is *Meaningfulness*. It is the motivational component of the SOC and refers to the extent to which life makes sense and one wishes to cope with the stressors. Meaningful life experiences throughout the life course help to develop SOC and allow one to reach out in any given situation and apply the resources appropriate to a given stressor. The stronger a person's SOC, the greater the ability to identify and use GRRs in a way that benefits their health. When confronted with a stressor, a person with a strong SOC will be motivated to cope (meaningfulness–motivational), believes that the challenge is understood (comprehensibility–cognitive) and believes that resources (GRRs) to cope are available (manageability–behavioural) [31, 32].

Life experiences shape one's sense of coherence [33]. In SMH life experiences that are characterized by consistency, load balance and participation in shaping outcomes, are conducive to a high SOC [29]. From the time of birth, people constantly go through situations of challenges and responses, tension and stress [26]. The more

these experiences are characterized by consistency, an underload-/overload balance of stimuli, and participation in shaping outcome, the more people begin to see the world as being coherent and predictable [26]. Predictability gives rise to comprehensibility (life challenges are understood), underload/overload balance gives rise to manageability (life challenges are seen as manageable), and participation gives rise to meaningfulness (life challenges are seen as meaningful to engage with) [34]. The combination of the three elements comprehensibility, manageability and meaningfulness forms the concept of SOC. **Table 1.1** gives an overview of the major differences between the risk factor-oriented approach (pathogenic orientation) and the salutogenic model of health (s salutogenic orientation).

Table 1.1: Major differences between pathogenic orientation and salutogenic orientation

	Pathogenic orientation	Salutogenic orientation
Definition of health	Absence of disease, dichotomous classification into healthy or sick	Dynamic process, conceptualizing health as a continuum: healthy/ disease continuum
Pay particular attention to / Focus	Focus on risk factors (determinants of ill health)	Illuminates salutary factors that actively promote health. Health is much more than being low on risk factors.
	Focus on a “particular pathology, disability or characteristic” of a person	Relates to all aspects of the person
	Focus on the diagnosis	Focus on listening people’s own story and not on diagnosis
View on stress	Stress is pathogenic	Stressors and tension may be pathogenic, neutral or salutary
View of therapy	The ideal in therapy is the magic bullet meaning that based on the right diagnosis you search to find the right cure	The ideal in therapy is the person’s ability to actively adapt and not the magic bullet

Source: [33].

Because of the relevance of life experiences within the SMH, it is important to consider the life course perspective. The life course research approach takes into account the history and the path reliance of the practices overtime [35]. The life course research links the practices to the dynamics of the social and environmental contexts in which the individuals live [35]. The life course research applied to nutrition related health practices helps to understand how past experiences and events interact with the current environment to both enable and limit current health practices or behaviors such as

food choices [36, 37]. Hence, the life course of the mothers has consequences on their dietary practices. For instance, woman's life experiences with food practices during childhood and adulthood may have an influence on the way she manages her current IYCF practices.

Evidence continues to be limited on how people (for instance mothers) deal with challenges throughout the life course and how this results in a healthful orientation of their IYCF practices. For instance, in many Sub-Saharan African countries in general and in Rwanda particularly, mothers face stressors that hinder their IYCF practices including maternal perception of insufficiency of breastmilk, mothers' heavy workload, health status of the mother or the baby, economic factors (e.g. lack of money to buy appropriate food due to poverty leading to household food insecurity) and social factors (e.g. as pressure from family members and peers to introduce food early, lack of support from community for optimal IYCF, marital abuse). Understanding IYCF practices in a salutogenic way requires an understanding of how mothers having and rearing children manage well to deal with these stressors in order to provide adequate nutrition for their children. In this thesis, the available resources (facilitating factors) throughout the life course of the mothers ranging from intrapersonal (psychological), social and physical environmental resources as well as the way they use them to deal with everyday stressors around them and continue with healthy IYCF practices were considered. Such an understanding of enabling resources (factors) can contribute to the design of solution-oriented strategies that enable healthy IYCF practices in Rwandan households and thus contribute to the reduction of child undernutrition

Overall aim and research questions

The overall aim of this thesis is to identify factors that enable healthy IYCF practices in Rwandan households in order to contribute to the development of solution-oriented strategies for reducing child malnutrition.

The following research questions are addressed:

1. What are the perceived challenges towards infant and young child feeding practices and the responses applied to overcome these challenges?
2. What factors impede or facilitate recommended infant feeding practices during the first 12 months of a child's life?
3. How do life course learning experiences play a role in shaping infant and young child feeding practices during the first year of child's life?

Thesis outline

The research questions are answered by use of mainly qualitative research methods in both cross sectional and longitudinal study designs. **Chapter 1** gives the background and rationale of the studies presented in this thesis. **Chapter 2** (research question 1) by using Focus Group Discussion (FGD) with key informants presents the perceived challenges towards infant and young child feeding practices and the responses applied to overcome these challenges. **Chapter 3** (research question 2) describes the patterns of factors impeding and facilitating the WHO recommended infant feeding practices during the first 6 months of child's life, in a longitudinal cohort study. Thereafter, **Chapter 4** (research question 2) shows factors that facilitate infant feeding practices during the first 12 months of child's life. The study in **Chapter 5** (research question 3) examines the underlying learning experiences and coping mechanisms through the life course that play a role in shaping infant feeding practices. **Chapter 6** presents a summary of the main findings from each chapter followed by a general discussion of the findings all together, their relevance for nutrition promotion, and recommendations for further research.

Brief description of the study area

Rwanda is a small landlocked country in eastern Africa with a surface area of 26,338 km² and 12,756,625 million inhabitants [38]. The country is divided into four provinces that are Eastern, Western, Northern and Southern provinces as well as Kigali city. Each province is subdivided into district and the four provinces and Kigali city are divided into 30 districts [38]. In turn, each district is divided into sectors which are further divided into administrative cells. Rwanda is surrounded by the Democratic Republic of Congo in the West, Uganda in the North, Tanzania in the East, and Burundi in the South. Most of the Rwandan population live in rural area and relies on agriculture as their main source of food and income. This study was carried out in Muhanga district, in Southern province of the country (**Figure 1.2**). The majority of population in Muhanga district lives in rural area. The main source of income and food in Muhanga district is agriculture. Muhanga district had reduced poverty headcount from 53.3% in 2010/2011 to 30.5% in 2013/2014 [39]. In contrast, the 2014/15 RDHS found that 41.6% of children under the age of 5 were stunted; this is above the national rate of 38% [17].



Chapter 1

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Chapter 2

Challenges and responses to infant and young child feeding practices in rural Rwanda: a qualitative study

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Abstract

Background: Despite different interventions to improve child nutrition conditions, chronic malnutrition is still a public health concern in Rwanda, with a high stunting prevalence of 38% among under five-year old children. In Rwanda, only 18% of children aged 6–23 months are fed in accordance with the recommendations for infant and young child feeding practices. The aim of this study was to explore challenges to infant and young child feeding practices and the responses applied to overcome these challenges in Muhanga district, Southern province of Rwanda.

Methods: Sixteen (16) focus group discussions were held with mothers, fathers, grandmothers and community health workers from 4 rural sectors of Muhanga district. The discussions were recorded, transcribed verbatim and thematically analysed using qualitative data analysis software, Atlas.ti.

Results: Two main themes emerged from the data. Firstly, there was a discourse on optimal infant and young child feeding (IYCF) practices that reflects the knowledge and efforts to align with early initiation of breastfeeding, exclusive breastfeeding for the first 6 months as well as initiation of complementary foods at 6 months recommendations. Secondly, challenging situations against optimal practices and coping responses applied were presented in a discourse on struggling with everyday reality. The challenging situations that emerged as impeding appropriate IYCF practices included perceived lack of breastmilk, infant cues, women's heavy workload, partner relations and living in poverty. Family and social support from community health workers and health facility staff, financial support through casual labour, mothers saving and lending groups as well as kitchen gardens were used to cope with challenges.

Conclusion: Factors influencing IYCF practices are multifaceted. Hence, intervention strategies to improve child nutrition should acknowledge the socially embedded nature of IYCF and address economic and social environmental constraints and opportunities, in addition and above knowledge only.

Background

Children's rights to adequate nutrition, good health and proper development are often violated, especially in developing countries, where undernutrition is one of the leading causes of mortality in children under the age of 5 [1]. The problem is endemic in Sub-Saharan Africa (SSA) and accounts for the highest mortality rate in the world, again especially for children under five years of age [2–4]. The causes of undernutrition include, among others, inadequate breastfeeding and complementary feeding practices [5]. Adoption of recommended feeding practices is one of the most effective strategies for optimal nutrition and preventing deaths among children under five years of age [6].

In Rwanda, despite the progress achieved in reducing under-5 mortality in the last decades, chronic malnutrition among children continues to be an important public health problem. According to the latest Rwanda demographic and health survey (RDHS) about 38% of under-5-year-old children were stunted in 2015 [7]. Only 30% of breastfed children aged 6–23 months had been fed foods from the minimum number of food groups for their age, 47% were fed the minimum meal frequency and 18% of Rwandan children aged 6–23 months met the minimum acceptable diet in 2015 [7].

Strategies that aim to improve infant and young child feeding (IYCF) practices have to consider three aspects: *First*, the current emphasis is on feeding practices (breastfeeding and complementary feeding) and its impact on child growth. However, IYCF has a multi-dimensional (food practices, care practices, hygiene-related practices, social network) and multi-level (child, mother–child, household, community, society) nature, and emphasis should be put on the interplay between the dimensions and levels. *Second*, most studies focus on nutritional-physiological aspects such as timing, composition and frequency of IYCF, not addressing its social embeddedness. IYCF is learned, supported and expressed in expansive social, everyday-living situations. Hence, the current body of knowledge insufficiently addresses the everyday reality in which IYCF is interwoven with a series of other everyday social practices, influenced by factors operating at different levels. Current strategies therefore may lack relevance and applicability in caregivers' everyday lives and fail to induce change. *Third*, IYCF is studied merely from a problem orientation, missing out on the responses already applied to overcome challenges. In adverse contexts, there are always people who deploy resources in a specific way that leads to good outcomes. Tapping into existing coping strategies to understand how IYCF operates in different contexts may shed light on context-specific interventions to address malnutrition.

This study considers these aspects by taking the everyday reality in which IYCF is practiced as the point of departure. From here, interrelations between IYCF and other

everyday ambitions and practices are investigated. In this first study, the aim was to investigate challenges to infant and young child feeding practices and the responses applied to overcome these challenges in Muhanga district, Southern province of Rwanda.

Methods

The study setting

The study was conducted in March 2015 in Muhanga district in Rwanda's southern province. In 2012, Muhanga district had a population of 318,965 people [8]. Although 39.1% of the Rwandan population was living below the poverty line between 2013–2014 [8], Muhanga district was one of the best performers, having reduced the poverty headcount from 53.6% in 2010 to 30.5% three years later. In contrast, the 2014/15 RDHS found that 41.6% of children under the age of 5 were stunted; this is above the national rate of 38% [7]. In 2012, 26% of the households in Muhanga were food insecure against the national average of 21% [9].

Study population and sampling procedure

Data were collected through Focus Group Discussions (FGDs) with four key informant groups: mothers and fathers of infants aged 0–23 months, grandmothers and Community health workers (CHWs). Four administrative sectors were selected using systematic sampling. We assumed that the feeding practices might differ across the district due to the district morphology (variability in landscape). To capture all possible IYCF practices throughout the district, we purposively selected a sector from the north, a sector from the center, and two sectors from south of the district. In each sector, a purposeful sample per group was selected with the help of the person in charge of community health at health center level and CHWs at the lowest administrative unit (cell). The criteria for selecting key informants were the following: (1) having an infant between 0 and 23 months old for parents; (2) willingness to participate in the study and (3) having personal knowledge and experience in relation to IYCF practices. Separate FGDs were conducted with mothers, fathers, grandmothers and CHWs. To address age-related variability in child feeding practices, parents were recruited on the basis of four age categories for their children: 0–5 months, 6–8 months, 9–12 months, and 13–23 months. Each age category was represented in FGDs by both mothers and fathers. In each administrative sector, four FGDs were held, each with nine representatives from each key informant group, resulting in a

total of 144 participants for the entire district (4 key informant groups x 4 FGDs/key informant group x 9 participants/group = 144). The rationale for the high number of participants was to capture all possible feeding practices and influences throughout the district. During the fourth FGD in each group, no new information was arising, indicating data saturation, and further inclusion was stopped. **Figure 2.1** summarizes the sampling procedure for participants.

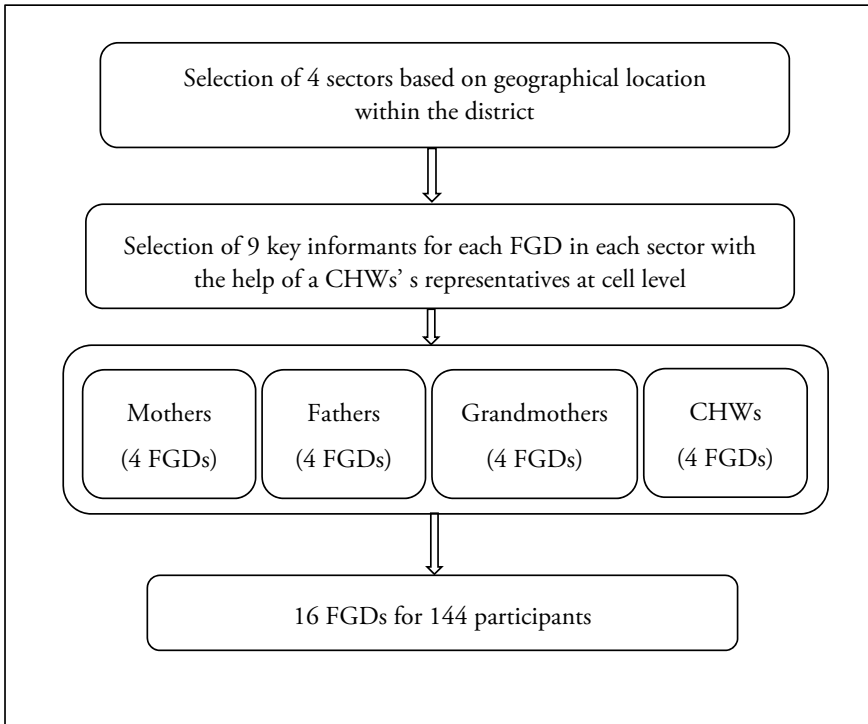


Figure 2.1: Participants' sampling procedure.

Data collection

The modules applied by Pelto *et al.* (2013) in their multi-country focused ethnographic study on child malnutrition in Ghana, South Africa and Afghanistan [10] as well as in Kenya [11] were adapted and used to guide the FGDs. The discussion guide covered 4 modules on IYCF: (1) Breastfeeding (BF), (2) Complementary feeding (CF), (3) Food preparation and storage of foods and drinks for infants, (4) Challenges faced by parents of young children, particularly those related to breastfeeding and complementary feeding and responses towards these challenges. Modules on breastfeeding and

complementary feeding were in line with WHO indicators for assessing IYCF practices [12]. The FGDs included open-ended questions and free listing approaches to collect perceptions towards IYCF, perceived challenges and responses applied to overcome the challenges. **Table 2.1** summarizes the content and focus per each module. All FGDs were conducted by a team of two, including the principal investigator as a moderator and a research assistant trained in conducting FGDs as a note-taker. The FGDs were conducted in Kinyarwanda (mother tongue) and each FGD was taking between 40 and 80 minutes.

Table 2.1: FGD-data collection guide

Modules	Content	Focus
1. Breastfeeding (BF)	Infants 0–5 months of age - BF initiation, EB and other care practices - Difficulties encountered during BF period and coping responses	- Period of EB (0–5 months) - Community members' perceptions on BF practices
2. Complementary feeding (CF)	Infants 6–8; 9–12; 13–23 months of age - Timing of introduction of CF - Feeding practices, foods or drinks given to the infants in addition to BF - Difficulties encountered during this period and coping responses	- Community members' perceptions on CF practices - Care and duties
3. Food preparation, feeding practices, and storage of foods and drinks for infants	Infants 6–8; 9–12; 13–23 months of age - Caregiver behaviours in relation to food preparation and storage	- Specially prepared food for infant (if prepared for whole family, is it modified for the infant, e.g. thinned out?) - Who prepares the food? - How prepared: single portion or extra (if so, which type of storage vessel)? - Who feeds the food to the infant, specifically when mother is away?
4. Breastfeeding and Complementary feeding challenges and responses	- Perceptions on challenges, and responses applied to overcome challenges - Community support for IYCF	- Perceptions on breastfeeding and complementary feeding challenges - Responses to challenges - Role of other community members in providing support

Ethical consideration

The study proposal was reviewed and approved by the Rwanda National Ethics Committee (No 92/RNEC/2015). All the investigators have had research ethics training. Informed written consent was obtained from every participant prior to participation in FGDs. In addition, confidentiality of information obtained was ensured.

Data analysis

The FGDs were audio-recorded and transcribed verbatim by two research assistants. The principal investigator checked the transcripts for quality against the original recordings and against the field notes for accuracy. Atlas.ti software for qualitative data analysis (version 7.5.10) was used for coding and analysing data. All transcripts were analysed inductively with respect to the following phases of thematic analysis: familiarization with data, generating initial codes, selection, review, definition and naming of themes as well as reporting [13]. Codes were reviewed and discussed by the first, second and third author. These codes in turn were grouped into major families and then into themes representing reported infant feeding practices, challenges and responses applied to overcome challenges. In presenting the data, relevant verbatim quotes were translated from Kinyarwanda to English by the principal investigator and were reported to aid the interpretation of the data in each theme. Quotations are tagged by participant group (M = mothers, F = fathers, GM = grandmothers, CHW = community health workers) and by sectors of residence (1 = Muhanga, 2 = Kabacuzi, 3 = Nyarusange, 4 = Cyeza).

Results***Overview of the results***

Two themes emerged from the data: *Firstly*, a discourse on optimal practices that reflects the knowledge about, and efforts to align with recommendations on proper IYCF practices. All aspects were reported by all groups with the exception of affective and responsive breastfeeding, which was not reported by fathers. *Secondly*, challenging situations encountered that hinder optimal practices and responses applied to cope were present in a discourse on struggling with everyday reality (**Table 2.2**).

Table 2.2: Overview of results

Perceptions theme 1: ‘The way we do it’		Perceptions theme 2: ‘Struggling with everyday reality’	
IYCF practices	Appropriate IYCF	Challenging situations	Responses
BF practices	- Early initiation of breastfeeding	- Breastmilk production is not yet established immediately after birth	- The child is given boiled water to relieve hunger
	- No other foods or drink is given to the baby except breastmilk up to 6 months	- The child <6 months shows appetite	- The child is given cow’s milk instead of breastmilk for a short period
	- Breastfeed the baby on demand	- The mother fears losing occasional daily labour	- The food is provided to child
	Importance of mother–child interaction:		- The child is not breastfed on demand
CF practices	- Affective and responsive breastfeeding	- Anxiety due to conflict between partners	- Limited care while breastfeeding
	- Touching and eye-to-eye contact with the child while breastfeeding	- Stress due to limited (financial) support from partner	- Limited care while breastfeeding
	- Respect the child’s hunger and satiety cues	- Excessive workload	- Short time for breastfeeding and little mother–child interaction
	- Introduction of CF at 6 months	- The child older than 6 months refuses food or is not interested	- Continued EB instead of providing complementary food
	- Foods 6–8 months: porridge, cow’s milk, biscuits, fruits	- Belief that breastmilk alone is enough after 6 months of the child’s life	- Continuation of EB beyond 6 months
	- Foods 9–12 months: beans, sweet potatoes, cooking bananas, vegetables, small fish in addition to porridge and cow’s milk started earlier	- Excessive workload	- Preparing food from what is available at hand, caring less about the quality

Table 2.2: *Continued*

IYCF practices	Perceptions theme 1: 'The way we do it'	Perceptions theme 2: 'Struggling with everyday reality'	
	Appropriate IYCF	Challenging situations	Responses
CF practices	<ul style="list-style-type: none"> - Foods 13–23 months: beans, vegetables, sweet potatoes, cassava - Responsible for preparation: mothers, except when seriously ill (father) or away (female siblings, grandmothers, babysitters) - Infant has own pot because of immaturity of digestive system - Food stored in closed pot or container and warmed up for next feed 	<ul style="list-style-type: none"> - Poverty 	<ul style="list-style-type: none"> - Selling more nutritious and expensive food to buy cheaper food - Looking for casual labour in the plots of well-to-do neighbours - Mothers' saving and lending groups - Kitchen garden

Theme 1. ‘The way we do it’: Discourse on optimal infant and young child feeding practices

This theme represents participants’ discourse on how they attempt to follow recommendations on optimal IYCF:

Initiation and exclusive breastfeeding practices

Most of participants across all the different categories of respondents reported that mothers initiate breastfeeding immediately after birth, within the first hour, and that new-born infant do not receive any food or drink immediately after birth except breastmilk until they reach 6 months of age. For instance, one father said:

“Giving prelacteal feeds to the new-born no longer exists. The child is fed only breastmilk immediately after birth till 6 months, the time at which complementary foods are introduced.” (F-3)

Participants, across all the different categories, reported that mothers receive information about EB immediately after birth from health centres health professionals and CHWs.

“Since we are used to giving birth at the health facility, we are taught the advantage of EB for the first 6 months. Furthermore, once we give birth at the health facility, we are all told that it is mandatory to breast feed immediately after birth.” (M-2)

“Even after being discharged and back in the community, the Community Health Workers continue to sensitize mothers to exclusively breastfeed. There is a clear change towards EB.” (GM-1)

CHWs argued that this awareness resulted from community-based education on the importance of early initiation and EB for the first 6 months. As one CHW stated:

“.....mothers used to give hot water to their children immediately after birth, so that they would not cry as breastmilk was not yet established, but thanks to organized community-based campaigns now mothers are aware that the new-born should be given nothing else except breastmilk immediately after birth.” (CHW-1)

Participants discussed not only the practice of EB for the first 6 months, but also the way breastfeeding is performed in terms of affection and responsiveness to the child. Most CHWs and mothers were aware of the role of mother–child interaction during breastfeeding episodes, unlike fathers and grandmothers. Participants asserted that

mothers pay attention to their babies being breastfed and that breastfeeding is done on demand with respect to the child's hunger and satiety signals, such as voice and facial expression, as illustrated in the following:

“When breastfeeding, the mother holds well her child close to the breast using her arms and hands to support the baby's head and neck, supports her breasts with her hands and helps the child to latch on in addition to touching and making eye-to-eye contact with the child while breastfeeding, and letting the child himself decide when he has had enough.” (M-1)

“You have to be joyful while breastfeeding. A mother feels delighted when a child smiles at her while being breastfed, both of them feeling that proximity which is a key for motherhood and improved lactation.” (CHW-4)

Complementary feeding practices

Most of the respondents reported that, besides continued breastfeeding, children receive complementary foods when they are 6 months old and not earlier. The most prominently mentioned food items reported as offered to children between 6 and 8 months are porridge, cow's milk, biscuits, fruits such as banana and passion fruit. Porridge and cow's milk are culturally the foods most frequently consumed by infants within the age range of 6 to 8 months in the study area. The porridge is made from one or more of the following cereals: sorghum, maize, soya beans, and wheat cooked with water and sometimes mixed with sugar. Beans, sweet potatoes, cooking bananas, cassava, green leafy vegetables and small fish were most frequently cited by the study participants as foods items consumed by infants aged 9–12 months, in addition to porridge and cow's milk started earlier. For children within the age range of 13 to 23 months, participants reported that they consume family foods. The findings from the FGDs revealed that generally mothers are the ones responsible for food preparation for infants and young children. It is only during exceptional cases like serious illness of the mother that the father can step in and prepare food. Older female siblings and grandmothers were also cited by participants as helping to make infant and young children's food when mothers are away.

Theme 2. ‘Struggling with everyday reality’: Challenges impeding optimal IYCF practices and the coping responses applied

Participants talked about various challenging situations inhibiting adequate IYCF practices as well as the responses used to overcome these challenges.

Perceived lack of breastmilk

Some mothers believe that breastmilk production does not start immediately after delivery. In that context, while waiting for effective breastmilk production, boiled water and/or cow's milk were said to be used as a response to relieve the child's hunger. For instance, 2 mothers said:

"There is a time when immediately after birth a child gives the impressions that she/he wants to be breastfed but, as a mother believes that breastmilk is not yet produced, she feeds the baby with boiled water, usually using a small spoon." (M-4)

"Similarly, it might happen that there is a mother who does not produce breastmilk for entire 3 days from birth. When a mother squeezes her breast and realize that nothing at all is coming out, in this case it is normal to let the baby have cow's milk until breastmilk comes in." (M-1)

Infant cues

Although most of participants knew about EB for the first 6 months, some participants, across all categories of the respondents, however, revealed that introduction of complementary foods too early before an infant is 6 months old was sometimes practiced. The reasons given for early introduction of complementary foods were that the child showed signs of hunger such as crying as well as showing interest to others eating after breastfed and therefore the need to give food other than breastmilk as a response to cope with this.

"It happens that the baby has not reached mature age for eating but he showed an interest in solid food when others are eating. However, considering the hardship a mother goes through to sustain the gains she decides to give food to the baby even before recommended months." (M-3)

Others mentioned that some mothers delayed introducing complementary feeding as they believe that breastmilk is still enough after 6 months of age, depending on the child's behaviour, such as refusing to eat or showing disinterest in foods. Belief that breastmilk is still enough after 6 months was common for mothers, grandmothers and fathers.

"It is possible that a child refuses to eat even after 6 months despite repeated attempts at 7 or 8 months not because you didn't feed him/her but because the child gets enough breastmilk and is less interested in other food." (M-2)

In this case, participants said that the mothers facing this challenge continue to breastfeed exclusively even beyond 6 months until she starts noticing the insufficiency of breastmilk.

“Sometimes the child is not courageous enough to eat then the mother decides not to pressurize the child at eating but leaves him/her in peace up to 7 or 8 months.” (GM-3)

Women’s workload

Participants, mainly mothers, identified heavy workload as a challenging situation for optimal breastfeeding practices where they argue that, because of many household chores and farm work, breastfeeding mothers cannot find enough time to breastfeed their babies. This heavy workload was also found to be responsible for sub-optimal complementary feeding practices by mothers. This is illustrated by these quotes:

“Another challenge is the heavy workload for the mother during the EB period, where the breastfeeding mother is left with all those household duties which in turn affect the quality of care given to the young child as the mother lacks sufficient time for caring and feeding.” (M-1)

“Inadequate complementary feeding practices are due to excessive workload where mothers spend the day farming and when back home late in the evening, she prepares what is available at hand, caring less about the quality.” (M-4)

Participants, mainly mothers and CHWs, mentioned that some mothers breastfeed the baby only when the baby cries and breastfeed concurrently with some other manual work. The latter happens especially for mothers whose livelihood depends largely on occasional daily labor; for instance, during farming activities mothers do not leave their infants at home but carry them along. In some cases, even when the infant is crying for breastmilk, the mother does not respond immediately for fear of losing her job. In that condition, participants reported not having access to any response to cope with this situation. As one CHW stated:

“Challenges also include little attention from breastfeeding mothers who only do so upon demand expressed through baby’s crying, while the working woman only breastfeeds her/him to stop crying and then goes back to work immediately.” (CHW-4)

Grandmothers, older siblings and neighbours were mentioned as resources to look after and feed the infant if mothers are away on farm work or paid labor.

Partner relations

Limited financial support from a partner at household level was also highlighted by study participants, mainly mothers, as being among the most important challenging situations inhibiting adequate breastfeeding and complementary feeding practices. Participants revealed that some male partners are unsupportive and do not care about contributing to feeding the family and see it as their wives' business.

"It is only up to a woman to worry about feeding the family and in time of food scarcity she is always more concerned than the husband (male partner) otherwise men are free riders. Those catering for their families living are very few." (GM-1)

In addition, one mother highlighted the negative effect of family conflicts on the breastfed child.

"Conflicts between partners that lead to anxiety also lead to inadequate care of the child during breastfeeding episodes." (M-3)

In this situation, the mother reported that she becomes stressed and loses concentration or pays less attention to breastfeeding the child than she would do in normal circumstances of harmonious family life. Yet, few other mothers and fathers reported appreciable social support from husbands in providing money to buy food, cooking, childcare and feeding the children.

Poverty

Participants, across all the different categories of respondents, linked inadequate breastmilk supply to the lack of adequate and sufficient food for mothers due to poverty. In addition, they emphasized that poverty affects complementary feeding practices because poor households do not have enough financial resources to buy food.

"Adequate breastfeeding goes hand in hand with food security. In the absence of the latter, due to poverty, for instance without porridge you cannot aspire to satisfying your baby while breastfeeding." (M-3)

"Poverty is of course among major constraints for complementary feeding practices. If a mother does not have money, then it is obvious she won't be able to buy milk or cereals for the child." (CHW-2)

Participants reported a variety of responses to cope with poverty. Some participants said that, in the case of food insecurity caused by poverty, some parents resort to selling

more nutritious and expensive foods to buy cheaper ones, and looking for casual manual labour in the plots of their well-to-do neighbours.

“There are those who decide to sell eggs for instance in order to buy potatoes that can be fed and shared among many households members and thus sacrificing nutritious food to acquire alternative bigger quantities food items.” (M-2)

Informal financial support through voluntary mothers’ saving and lending groups as well as growing different kinds of vegetables in their kitchen gardens were used to cope with poverty induced nutrition challenges. For instance, one mother said:

“Women are no longer dependent to their husbands because they formed cooperatives and associations that help them generate revenues and buy nutritious foods without relying on a husband as the breadwinner.” (CHW-2)

“Moreover, here at community we have been sensitised to have kitchen garden in each household to ensure good nutrition. We have been trained and we know the nutrition value of having kitchen gardens.” (M-1)

Discussion

This study investigated challenges to infant and young child feeding practices and the responses applied to overcome these challenges in Muhanga district, Southern province of Rwanda. Most of participants were aware of the WHO recommendations of EB for the first 6 months. Additionally, participants revealed that most of the mothers in the study community aim to follow the recommended IYCF practice such early initiation of breastfeeding, EB for the first 6 months and timely initiation of complementary foods. Respondents highlighted the importance of responding to infants’ hunger and satiety cues, practicing a warm and affectionate relationship with the child during breastfeeding and complementary feeding. Previous studies show that warm and responsive interactions between caregivers and their children strongly influence children’s health and development [14-16]. Besides the food provided for infants and young children, the way the food is provided to them influences their acceptance of food, dietary intake and, hence, their growth and development [17, 18].

Poverty was considered by participants as the major challenge affecting EB for the first 6 months and complementary feeding practices. Poverty is well known for its negative impact on the proper growth and development of children in Rwanda [19] and elsewhere [20-23]. Despite the damaging effect of poverty, participants reported

a variety of responses to overcome poverty-induced nutrition challenges. Participation of mothers in voluntary saving and lending groups was perceived as helping mothers to alleviate poverty, as mothers can borrow and use that money to buy food. This is in line with prior studies highlighting that, when women have more control over the family's financial resources, a larger proportion of income is allocated for children's basic needs [24], including food. Therefore, this finding emphasizes the potential of economy-strengthening actions such as mothers' village savings and loan groups for solving food insecurity induced by poverty. The importance of kitchen gardens in growing different kinds of vegetables and improving dietary diversity was also pointed out by participants. Dietary diversity intervention strategies, including home gardening, have been reported to have a positive influence in overcoming micronutrient deficiencies and thus child undernutrition [6]. Home gardening has also been shown to act as a means of empowering women by enabling them to have greater control over the quality of the family diet [25]. A study conducted in Afghanistan showed that a kitchen garden may improve family food security and access to income for women, who tend to increase spending on children's health and nutrition [26]. Therefore, there is a need to encourage female involvement in establishing and maintaining kitchen gardens and creating mechanisms for seed supply systems to ensure long-term sustainability.

Women's laborious work associated with poverty was considered as another challenge for both appropriate breastfeeding and complementary feeding practices among the study participants. Mothers, in addition to being responsible for household chores and farm work, are responsible for childcare and feeding among others. Lack of time to feed and care for the child due to working outside the home including farming activities as well as other household chores has been shown to limit the mother's ability to use appropriate IYCF practices such as EB and optimal complementary feeding practices [27, 28]. The challenges that mothers face because of their heavy workload are known to have a negative impact on nutritional outcomes for children [29, 30]. This finding points out the need for interventions to help women allocate more time to caring for and feeding children. Home-based piece work and craft production, including basket weaving, are among the options that could be explored and would replace the more laborious work. Additionally, interventions that focus on providing day-care facilities are also to be encouraged to free mothers during their working hours.

The role of social support in improving IYCF practices is well documented in the literature [31, 32]. The involvement of male partners in breastfeeding promotion and education and providing fathers with knowledge and skills for optimal breastfeeding has been proven to affect EB rates positively [33, 34]. In this study, participants

reported limited social support from partners for appropriate IYCF practices. The relatively limited male involvement in childcare and child feeding-related activities is very common in non-western societies, including in SSA [31]. Men are in most cases considered as household head, and it is often assumed that they are generally responsible for providing financial and other resources for some households activities including food and for carrying out other tasks critical to family survival [31]. This was not, however, the case in the study area, as participants revealed that some husbands do not care about feeding the family and take it as wives' business. In such conditions, mothers are restricted in their choice of appropriate IYCF practices without financial support from their husbands. Consequently, providing mothers with adequate nutrition knowledge and education on appropriate IYCF practices has little influence without the involvement of their husbands or partners as the financial gatekeepers [35]. Intervention programmes should consider ways to increase the engagement of men in child feeding and caregiving.

Despite the role commonly ascribed to grandmothers as the guardians of tradition [36], social support from grandmothers may have a positive effect on child feeding practices. Grandmothers in the study area were also said to help mothers in child feeding and caring. This finding is similar to other studies in different settings [31, 36-38]. A study conducted in Kenya showed that encouraging the provision of social support to mothers by key household influencers such as grandmothers and fathers improved some targeted infant feeding practices, such as feeding the infant the minimum number of meals and dietary diversity [32]. These promising results support the need to adopt a wider, family-centred approach by providing resources such as more education to these influential family members to enhance support in child health, especially in optimal IYCF and care practices, as these relatives have less access to new knowledge than mothers do.

The strength of this study is its respondent's diversity. The ideas voiced out can therefore be taken as an exact reflection of community knowledge, beliefs and practices. Nevertheless, the study suffered from a number of limitations: Firstly, the participants were recruited in only one district, Muhanga, the findings may not be generalized to populations outside this area due to some specificities as well as the less representative sample from one district. However, as data saturation was reached during data collection, the findings were adequate to provide a deeper understanding of challenges and responses to infant feeding practices that allow for a judgment of the extent to which findings can be relevant and applicable to other similar settings.

Secondly, there was inability to observe the actual IYCF practices and behaviors as were reported by participants during the focus group discussions. Future research that confirms self-reported interview data with direct observations of IYCF practices in everyday life would be valuable. Thirdly, Participants might have over-reported the practices and influences due to social desirability bias. This might have been more evident for the grandmothers' responses as grandmothers' advice and concerns may reflect cultural beliefs and infant feeding practices that do not protect appropriate IYCF. However, the interviewers asked the same questions in different forms as much as possible to check for consistency in the responses.

Conclusion

This study finds that appropriate IYCF is not only about food practices – paying attention to the quality, diversity and amount of food being offered to children – but also about caregivers' responsiveness and affection during feeding episodes. The study reveals that a number of challenges including living in poverty, women's heavy workload, limited financial support from partners and seasonal fluctuations in food availability are perceived as impeding appropriate IYCF. Family and social support from CHWs and health facility staff, financial support through casual labour, mothers' saving and lending groups, and kitchen gardens were used to overcome challenges. Factors influencing IYCF practices are multifaceted. Hence, intervention strategies to improve child nutrition should acknowledge the socially embedded nature of IYCF and address economic, social environmental constraints and opportunities in addition and above knowledge only.

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Chapter 3

Prenatal infant feeding intentions and actual feeding practices during the first six months postpartum in rural Rwanda: a qualitative, longitudinal cohort study

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Abstract

Background: Exclusive breastfeeding (EB) is advocated by the WHO for the first 6 months. In Rwanda, the percentage of infants who are EB decreases from 94% among infants age 0–1 month to 81% among those age 4–5 months. Little is known about what influences mothers' breastfeeding practices. This study aimed to gain insights into expectant mothers' prenatal feeding intentions, the underlying reasons, actual practices after birth, and factors facilitating or impeding EB for the first 6 months of child's life in Muhanga district, Rwanda.

Methods: This qualitative, longitudinal study, conducted between December 2016 and October 2017 as part of a larger study, recruited a purposive sample of 39 pregnant women attending prenatal consultations during their last trimester in two rural health centers. They were interviewed once during pregnancy and in postpartum period within the first week, at four and 6 months postpartum to explore intentions, actual practices, critical transition points, and facilitating or impeding factors. Interviews were recorded, transcribed verbatim, and thematically analyzed using Atlas.ti software.

Results: Of 39 participants, 38 intended to breastfeed within the first hour after birth, and 32 intended to breastfeed exclusively for the first 6 months. In practice, 34 initiated breastfeeding within the first hour, and 12 breastfed exclusively for 6 months. Impeding factors include perceived breastmilk insufficiency, pressure from family members, past experiences, mothers' concerns over their infants' health, mothers' heavy workload, poverty, and food insecurity. Factors facilitating early initiation and EB include mothers' awareness of EB's advantages, confidence in their breastfeeding ability, and support from health professionals and family members.

Conclusion: Despite participants' intentions about breastfeeding, there was a gap between intentions and actual practices. An interplay of barriers from individuals to groups and societal levels impeded women from EB for the first 6 months. EB promotion interventions should consider supporting and equipping breastfeeding mothers with skills to deal with perceived breastmilk insufficiency and to recognize the true signs of baby hunger cues. Furthermore, important influential family and community members should be targeted to support mothers to breastfeed. Interventions that consider addressing the issue of poverty-driven food insecurity should not be overlooked either.

Introduction

Breastfeeding is the first fundamental right of the child. The World Health Organization (WHO) and UNICEF recommend that newborns should be breastfed within 1 hour after birth, be exclusively breastfed during the first 6 months of life, and continue breastfeeding until 24 months of age with appropriate complementary feeding initiated at 6 months [1]. Early initiation of breastfeeding within the first hour after birth is associated with significantly reduced neonatal mortality [2]. Exclusive breastfeeding (EB) for the first 6 months reduces the risk of many diseases, mainly gastrointestinal, respiratory infections, and chronic diseases affecting infants [3-5]. It also promotes sensory and cognitive development in infants [5-7]. As noted by Dewey and Huffman [8], a combination of factors including lack of EB in the first 6 months exposes older children to stunting. Lack of EB for the first 6 months has been found to be associated with increased risk of infections such as diarrhea, especially in developing countries, which further contribute to malnutrition and poor growth [9]. Despite the evidence supporting the importance of EB for child health, breastfeeding practices remain suboptimal worldwide, especially in low and middle-income countries, where only 38% of infants aged 0 to 6 months are exclusively breastfed [5], among which Rwanda is classified. The determinants of breastfeeding practices operate at multiple levels and affect breastfeeding intentions and behaviors over time. Personal factors such as knowledge about the benefits of breastmilk [10], structural factors, and undesirable socio-cultural beliefs and misconceptions prevailing in the community [11-13] and amongst healthcare providers [14] are reported to influence breastfeeding practices. However, the way in which the factors influence EB practices are contextual and differ from one setting to the next, necessitating setting-specific data.

The Rwanda National Food and Nutrition Strategic Plan 2013–2018 promotes EB, encouraging mothers to initiate breastfeeding within the first hour of birth and to continue EB for 6 months, after which complementary feeding is introduced to work alongside breastfeeding for at least two years [15]. Data from the Rwanda Demographic and Health Survey (RDHS) 2014–2015 show that 94% of the infants age 0-1 month are exclusively breastfed whereas this is reduced to 81% for infants age 4–5 months [16].

Although these estimates are available, no insight is provided on the “why” and “how” of the status quo, including “what” and “who” influences mothers’ breastfeeding decisions and practices. This information is important for informing the design of context-specific and targeted programs and policy interventions that will effectively improve health and nutrition outcomes for children in Rwanda. The aim of this study

was to gain insights, from a longitudinal qualitative study, into prenatal maternal infant feeding intentions, the reasons for these intentions, actual practices, and factors that facilitate or impede recommended infant feeding practices during the first 6 months of a child's life in a rural district of Rwanda.

Methods

Study design

The study adopted a longitudinal qualitative design to explore prenatal maternal feeding intentions, actual feeding practices from birth to 6 months of age, and factors facilitating or impeding recommended practices. Four interview points were used. To explore breastfeeding intention, interviews were conducted during pregnancy. To explore actual practices, our study adopted the WHO and UNICEF recommendations of initiating breastfeeding within 1 hour of birth and to continue with EB for 6 months [1]. Interviews were conducted within the first week after birth and at 4 and 6 months postpartum, indicating the critical transition points (periods at which changes in feeding practices occur), to explore feeding practices and factors facilitating or impeding recommended practices.

The study, undertaken between December 2016 and October 2017, was conducted within the framework of a larger longitudinal study aiming to unravel the postnatal determinants of stunting in the area, with a total study population of 190 mother–child pairs. Both studies were undertaken at the same time, but with different orientations and using different theory-based methods. The quantitative study had a nutritional-physiological orientation to investigate the determinants of child growth whereas this current study had a social orientation toward understanding infant and young child feeding practices. There was no difference in treatment between the children in the study and the other children. All children were measured monthly by Community Health Workers (CHWs), who gave feedback to the mothers. The only difference is that the children included in the study were also measured for anthropometry by the researchers.

Theoretical basis of the study

The Theory of Planned Behavior (TPB) guided the exploration of mothers' decisions and practices [17]. The TPB focuses on the psychological factors influencing behaviors. It posits that the immediate antecedent of a behavior is the person's intention to

perform the behavior. The intention, in turn, is influenced by the attitude toward the behavior, subjective norm, and perceived behavioral control. Attitude toward the behavior refers to the overall evaluation, either positive or negative, of performing the behavior. Subjective norm reflects the perceived social pressures to perform or not to perform the behavior. Perceived behavior control, also called self-efficacy, refers to the perceived ease or difficulty of performing the behavior.

Study setting

The study was conducted in the catchment area of two rural health-center facilities (Rutobwe and Buramba) in Muhanga district, approximately 49 km south of Kigali city. The main activity is agriculture (practiced by 76% of households), and it is also the main source of income, although 90% of total production is for home consumption. Although 39.1% of the Rwandan population was below the poverty line as per the 2013–2014 Household Living Conditions Survey [18], Muhanga district was one of the best performers because it had reduced the poverty headcount from 53.6% in 2010 to 30.5% within the following 3 years. However, the 2014–2015 RDHS found that 41.6% of under-five children were stunted in Muhanga district; this is higher than the national average of 38% [16]. EB is promoted countrywide, including in study area. At health center facility level, mothers receive health and nutrition education including awareness raising on WHO recommended infant feeding practices from nurses during antenatal and postnatal care visits. The same awareness raising continues at community level, in every village (the lowest administrative unit) by CHWs during the antenatal and postnatal periods. Each village has: a) a pair of general CHWs who are responsible for community health, nutrition, and HIV/AIDS prevention; b) a maternal health worker, who manages infant, pre, and postnatal maternity care; and c) a CHW in charge of social affairs dedicated to addressing the wellbeing of individuals and the community.

Study population and sampling procedure

Women in the last trimester of pregnancy, visiting governmental health centers in Buramba and Rutobwe, were approached while queuing for prenatal care and were briefed about the study objectives. A total of 60 pregnant mothers out of 190 enrolled in the larger quantitative study were willing to be involved in our study. Recruitment stopped after enrolling 39 women in the study as data saturation had been reached. Inclusion criteria for the study consisted of being pregnant in the last trimester of pregnancy with no serious obstetrical conditions. Women who did not plan to reside in the area with the baby for the first year were excluded from the study.

Data collection and measurements

Open-ended in-depth interview guides were used to explore prenatal feeding intentions, actual feeding practices indicating the critical transition points, and factors facilitating or impeding recommended and/or intended practices from birth to 6 months postpartum. During enrolment, information was collected about participants' socioeconomic and demographic characteristics. In addition, women were requested to state their infants feeding plans from birth to 6 months of age. Participants provided the expected delivery dates and were contacted regularly until the baby was born. All 39 mothers delivered in health centers.

The interview questions were developed based on the TPB constructs [17]. To align with the qualitative nature of the study, prenatal intention, attitude, subjective norm, and perceived behavior control were assessed using self-reported open-ended questions instead of scales. Infant feeding intention was assessed by asking participants how they intended to feed their expected babies after birth, during the first 3 days after delivery, during the first month, and between 1 and 6 months of age. Attitude toward breastfeeding was assessed by asking women about their belief in the advantage or disadvantage of breastfeeding the baby within the first hour after birth and of EB for the first 6 months. The questions on the subjective norm construct looked more broadly at the women's perceived social pressure to perform or not to perform EB. The perceived behavior control questions related to factors that women perceived would help them to breastfeed their baby within the first hour after birth and to breastfeed exclusively for the first 6 months, as well as factors that would stop them from doing so. During the postpartum period, in-depth interviews were conducted in participants' homes. Follow-up interviews included open-ended questions that focused on exploring actual feeding practices and on obtaining a deeper understanding of factors facilitating or impeding the WHO-recommended practices.

The interview guides were piloted with both prenatal and postnatal mothers of young children attending nutrition rehabilitation at the health centers, and adjustments were made accordingly. **Appendix 3.1** summarizes the content of the interview guides. All interviews lasted between 30 and 60 minutes and were conducted by the first author with the help of a trained field assistant in the local language (Kinyarwanda). The field assistant was recruited in a competitive process. She had a bachelor's degree and some experience in qualitative data collection.

During the follow-up interviews, mothers were classified as practicing EB if they fed their infants only breastmilk from birth (with the exception of prescribed oral medicines

and oral rehydration solutions) until 6 months of age. Mothers were classified as not practicing EB if they fed their infants any non-breast milk liquid or food at one or more junctures since birth in addition to breast milk in the first 6 months. To determine when EB was terminated, mothers were asked to confirm the baby's age in months and weeks when foods other than breast milk were initiated.

Ethical considerations

Ethics clearance for this study was obtained from the Institutional Review Board of the College of Medicine and Health Sciences in Rwanda (Approval notice: No 058/CMHS IRB/2016). All the investigators have had research ethics training. Permission to collect data in Muhanga was obtained from local authorities. Informed written consent was obtained from every participant for the entire six-month study period prior to participation; however, quitting participation at any point was guaranteed. Participants were assured of confidentiality and the anonymity of recordings, that participation and withdrawal were voluntary, and that gathered information would be used solely for the purpose of the study.

Analysis

All interviews were audio recorded and transcribed verbatim by the same team. The first author checked the transcripts for quality against the original recordings and against the fieldnotes for accuracy. Interview transcripts were anonymized by using participant codes. At each round of data collection, the first author and another public professional translated 12 transcripts into English to ensure correct coding by English speaking authors. The data were analyzed using Atlas.ti software (version 7.5.10). Thematic data analysis was applied following Braun and Clarke's protocol [19], which involved the following phases: familiarization with data, generating initial codes, searching for themes, reviewing themes, defining and naming themes, and reporting. The translated transcripts were coded separately by the first and the second author, who then jointly reviewed emerging themes. Thereafter, the first author, who is bilingual, applied the codes and then grouped the codes into major families and themes in English for all the Kinyarwanda transcripts. Following the first author's coding in English of the kinyarwanda transcripts, a colleague with experience in qualitative research co-coded 12 of the Kinyarwanda transcripts independently, followed by a discussion and agreement on the different codes. The coding was guided by the research questions on infant feeding intentions, practices, barriers, and facilitators for the first 6 months of each child's life. Individual researchers' interpretations and the identified themes

were debated and challenged in a series of team meetings involving all authors, from which further analytical refinements emerged. To illustrate themes, typical quotations from participants were translated into English.

Results

Characteristics of the study population

Table 3.1 presents the participants' characteristics. Their ages ranged from 18 to 40 years, with a mean age of 34 years. Most of them (82%) were married. The main occupation for all of them was farming. Ninety-five percent had the ability to read and write their mother tongue. Five percent had not attended any formal education, 38% completed primary school, and 49% did not complete primary school and 38% completed primary school. Seventy-four percent had at least one child, and 77% had some experience of child feeding, including one first-time pregnant mother with experience in child feeding (See **Table 3.1**).

Table 3.1: Socio-demographic characteristics of women interviewed

Characteristics	Frequency	Percentage
Age of the mother (years) n=39		
<21	4	10%
21–30	13	33%
>30	22	57%
Marital status		
With partner	32	82%
Ability to read and write		
Yes	37	95%
Education level of the mother		
Illiterate	2	5%
Primary incomplete	19	49%
Primary complete	15	38%
Secondary incomplete	3	8%
Main occupation		
Farming	39	100%
Number of children		
0	10	26%
1–2	21	54%
3+	8	20%
Experience in child feeding		
Yes	30	77%

Overview of the results

Four major themes emerged representing mothers' infant feeding intentions and practices during the first 6 months: 1) breastfeeding intentions and reasons behind intentions, 2) breastfeeding practices, 3) barriers impeding early initiation of breastfeeding and EB for the first 6 months, 4) facilitators of early initiation of breastfeeding and EB for the first 6 months. Factors influencing breastfeeding practices during the first 6 months were classified throughout this research at three levels: individual, group, and societal. **Table 3.2** and **Table 3.3** summarize the above factors as barriers to, and facilitators of, optimal breastfeeding practices during the first 6 months; these factors are described in more detail below.

Breastfeeding intentions and reasons behind intentions

All women (n=39) planned to breastfeed their infants irrespective of the mothers' socio-demographic characteristics. Of the 39 women, 97% (n=38) intended to breastfeed their infants within the first hour after birth, and 82% (n=32) intended to meet the EB recommendation for the first 6 months.

The main reasons given by the mothers for their intention to breastfeed the baby immediately after birth included their knowledge of the high nutritional value of colostrum and the immunological protection of the newborn from diseases. For example, one mother said:

"I will breastfeed the baby within the first hour after birth because the first breastmilk protects the baby against diseases and is very nutritious." (W-13)

The mothers appreciated not only the nutritional and immunological benefit of colostrum, but also the mother's benefits from early suckling because it stimulates breastmilk production. For instance, two mothers said:

"Colostrum contains all the nutrients the baby needs; it is a problem if the baby fails to get it. In addition, breastfeeding the baby immediately after birth stimulates breastmilk production." (W-7)

"If I recall well for every previous birth, I was encouraged by older mothers to put the baby on breastmilk just to try and stimulate early production of breastmilk. That is the same belief and understanding I still have." (W-17)

The emotional bonding of the mother and the newborn was also reported as a factor influencing the intention to breastfeed the baby immediately. For example, one mother said:

“The source of energy for this is that I am pleased to see my baby putting something in the stomach. Breastfeeding increases our intimacy and the baby feels closer to me as a mother than anyone else. We share life as it used to be during the pregnancy. The increased relationship between me and my baby is the first drive to breastfeed it.” (W-34)

Knowledge of the recommended EB duration and its key benefits were identified by some women, including better health and the prevention of diseases like diarrhea that can result from giving other foods. For instance, two interviewed women stated:

“It is very important to breastfeed the baby exclusively for the first 6 months in order to protect the baby against diarrhea diseases and the resulting slowed growth, which happens when food is provided before 6 months.” (W-24)

“It is very important to only breastfeed an infant during the first six-month period because mother’s milk contains all the essential nutrients.” (W-34)

The respondents considered health professionals at health centers, specifically midwives, to be an important source of knowledge to support their intention to breastfeed exclusively. For instance, one mother said:

“Immediately after delivering, midwives tell you to breastfeed the baby in their presence and you do and when you arrive home you continue following their instructions.” (W-20)

One young woman expecting her first baby was undecided about how long after birth she would start breastfeeding the baby because of her limited experience in child feeding.

“It might happen that I do not need to breastfeed immediately after birth for instance as a young and first-time mother that I am, you can understand that I do not know whether I will have to wait either some seconds or hours to initiate breastfeeding.” (W-6)

Other three mothers did not plan to breastfeed exclusively for the entire first 6 months because they perceived breastmilk insufficiency as a factor that might hinder EB in that period. These women mentioned that they would not withhold food until 6 months; instead, they would respond positively by providing food for the baby.

“It happens that the baby at around four months shows strong signs of not getting enough breastmilk. If it ever happens to me, I cannot exclude giving my baby those few fruits and light porridge.” (W-13)

“The only obstacle to EB that I could foresee is what happens very often for the difficult postpartum breastmilk production, which renders early EB very challenging. When I experience that concern there is no other option but to give some half warm milk to the baby on a spoon but after strictly ensuring hygiene.” (W-24)

“It may happen that the baby shows interest and eagerness for food even at five months, I will provide to him fruits so that the baby’s growth is not compromised and other food will be given at 6 months.” (W-3)

Three other mothers did not intend to exclusively breastfeed for 6 months because they perceived diseases and poverty as factors that that might impede EB.

Breastfeeding practices

The number of women complying with the recommendations reduced over time: of the 39 women, 34 (87%) were able to initiate breastfeeding within the first hour after birth, 19 (49%) exclusively breastfed their infants for the first 4 months, and 12 mothers exclusively breastfed their infants for the first 6 months.

Barriers impeding optimal breastfeeding practices from birth to 6 months of age

From mothers’ experiences, the following factors impede EB:

Limited professional and social support

Three women reported not having initiated breastfeeding within the first hour after birth as recommended by the WHO/ UNICEF. Mothers stated this was due to receiving limited support from midwives (n=1) and expectant mothers’ escorts (n=2).

Most mothers reported that they received information from health professional staff about EB for the first 6 months. However, one mother mentioned that she gave her baby a mixture of lemon juice and honey to treat coughing at 3 months of age, advised by the health center staff.

“When the baby was seriously coughing at 3 months old, I went to the health center, the health professional staff told me to treat this by providing a mixture made with lemon juice and honey, I did and the baby was cured.” (W-18, month 4)

Postnatal discomfort

Two mothers reported that discomfort and feeling tired hindered early initiation of breastfeeding.

Perceived breastmilk insufficiency

In the first week after returning home, some women (n=3) reported giving the newborn some liquids, in addition to breastmilk. For instance, one participant reported having introduced cow's milk to the baby when she was discharged from the health center because of perceived breastmilk insufficiency. The reason for this perception was no milk being produced by expressing and the baby continuing to cry after feeds. For other mothers (n=10), the perception that breastmilk was insufficient (between 4 and 6 months) was a barrier to EB up to 6 months.

Perceived need for traditional medicines

In the first week postpartum, some participants (n=2) reported giving herbal remedies to the baby. The reasons for this perceived need included the baby crying a lot day and night due to stomach pain and the baby not passing stools.

“Because the baby was crying day and night, when I look back since we arrived home on Friday evening from the health center after delivery, Saturday the child cried all night, but after getting the traditional medicine, the baby stopped crying and slept well.” (W-36, week 1)

“When we reached home after discharge from the health center, my mother-in-law realized that the baby was not passing stools and then decided to provide herbs. The next day, the baby passed a stool, since then there is no problem.” (W-26, week 1)

At 4 months postpartum, almost half of the participants (n=15) reported giving herbal remedies (wild leaves) to their children because the infant was crying due to abdominal pain. The following quotation illustrates that:

“From two weeks after birth, the baby used to vomit after breastfeeding episodes, and I thought she may have a problem related to stomach pain and provided wild leaves. She is now getting better.” (W-29, month 4)

Influence of family members

Female family members were cited as providing barriers to EB. For instance, one mother reported giving cow's milk to the child at three months, half advised by her older sister.

"Because the baby used to cry so often during and after breastfeeding episodes, my sister gave him cow's milk despite the too young age and when she did, the baby was satisfied." (W-19, month 4)

Another mother reported giving boiled water to the baby at two and a half months, guided by her mother-in-law.

"Because the baby was suffering from constipation, my mother-in-law told me to give boiled water, and then I did." (W-35, month 4)

Perceived infant hunger cues

Between 4 and 6 months, the majority of respondents reported changing their feeding behaviors to introduce other liquid, and in some cases semi-solid food, in addition to breastmilk. Mothers (n=10) stated that, when the baby appeared very interested in family food and keen to eat, they felt they were depriving the infant by withholding food until 6 months and then decided to give them food. For example, one mother stated that, on top of having introduced cow's milk in the first week, she added other foods at 4 months, including fruits like banana and tree tomatoes and other foods such as banana plantains, carrots, Irish potatoes, and green leafy vegetables.

"The baby used to cry often while seeing older children eating even during the night and I could spend sleepless nights. I thought the baby was not having enough breastmilk and then decided to feed semi-solid items." (W-28, month 4)

Mothers' concerns over their infants' health issues

For some mothers (n=3), infants' illness and weight loss prompted them to interrupt EB and to introduce early complementary food like cow's milk in addition to breastmilk before 6 months.

"I disrupted the EB at one week and a half before 6 months and started giving fruits to the infant because she had been sick and lost weight. When they took measurements and found that the baby had regressed from the previous visit, I decided to give her some fruits before she attained the full 6 months in order to rehabilitate her." (W-15, month 6)

Mothers' heavy workload

Several women (n=9) reported that, because of their many household chores and farm work, they could not find enough time to breastfeed and care for their babies. This was particularly a concern for women between 4 and 6 months postpartum. The following quotations illustrate that point:

"For instance, if we go for farming and do not have time to come and prepare our lunch, we are bound to having dinner only and therefore one meal a day. In this situation, even the infant does not have that opportunity to be breastfed before we are back from the farm. I personally observe this and I am conscious of the negative effects as regards the infant." (W-26, month 6)

"Some of us have to wait until the baby cries to feel the need to breastfeed every time we are busy with household chores or on-farm activities." (W-5, month 6)

"Only limited time can hinder doing so. For instance, one can say I am going uphill for animal fodder, and then in the farmland activities once back home, then follow domestic responsibilities like cooking, and all those really pre-empt us from fulfilling our responsibilities as mothers such as entertaining our kids. With that, I cannot mislead you and say that I am up to doing it." (W-1, month 4)

Households' food insecurity

Mothers expressed their concern relating to lack of food in the household due to poverty and the resulting lack of sufficient breastmilk for the baby.

"Challenges are obvious because, if a mother has gone to bed hungry without food, a baby cannot get any breastmilk to suck. In this case, the only thing the mother can do to content the baby is carry him/her on her back the next day morning until you get some little breastmilk. Otherwise, if you have enough and adequate food as a mother, I do not see anything that can preclude you from breastfeeding your baby as much as possible." (W-22, month 6)

Conflicts with partner

One woman expressed how conflicts with her partner affect her intimacy with her baby while breastfeeding:

"It happens that here at home I have disputes with my partner and, in that case, I am completely in a different and unhappy mood. With that distress

you would understand that I cannot have any intimacy with my baby while breastfeeding.” (W-10, month 6)

Facilitators of breastfeeding practices from birth to 6 months of age

As well as barriers, women identified facilitators of the successful initiation of breastfeeding within the first hour and continuation of EB for 6 months:

Knowledge about the advantage of early initiation

Knowledge about the advantage of breastfeeding the baby within the first hour after birth was considered to help the mother to initiate breastfeeding at that juncture. For instance, one mother reported being very keen to feed the baby colostrum because she knew its importance.

“I knew that the child should be breastfeed immediately after birth within 30 minutes, as we were informed during the antenatal education that the first milk that comes is very important for child development.” (W-29, week 1)

Personal confidence in the ability to breastfeed

Confidence in the ability to breastfeed the baby was also reported as a facilitator of early initiation of breastfeeding on top of knowledge that the baby should have breastmilk immediately after birth. For instance, one mother reported:

“The most important thing is that knowledge of the nutrition value that the baby gets from breastmilk that helshe cannot get anywhere else. Once you have that knowledge and you have your own breast that is all! Again, the first and foremost is the willingness to breastfeed exclusively right from birth.” (W-34, week 1)

Support from health professionals and CHWs

The majority of women considered the practical and informational assistance provided by healthcare professionals from the health center, midwives, and CHWs as particularly important for early initiation of breastfeeding and EB for 6 months.

“Immediately after birth, right after I left the delivery room, the midwife told me and was monitoring whether I’m breastfeeding him right and the baby is sucking well.” (W-21, week 1)

Table 3.2: Summary of barriers to breastfeeding practices during the first 6 months

Barriers		Intentions	Birth	1 week	4 months	6 months
Feeding Individual level factors	Perceived breastmilk insufficiency	×		×	×	×
	Health concerns				×	×
	Poor knowledge	×				
	Postnatal discomfort		×			
Group level factors	Family influence			×	×	×
	Domestic conflicts					×
	Use of herbal remedies			×	×	×
Society level factors	Limited professional support		×		×	
	Food insecurity				×	×
	Mothers' heavy workload				×	×

Table 3.3: Summary of facilitators of breastfeeding practices during the first 6 months

Facilitators		Intentions	Birth	1 week	4 months	6 months
Feeding Individual level factors	Knowledge about the advantages of breastfeeding within the first hour	×	×			
	Knowledge about the advantages of exclusive breastfeeding for the first 6 months	×				×
	Confidence in the ability to breastfeed		×			
	Social support from family members		×	×		
Group level factors						
Society level factors	Professional support	×	×		×	×
	Support from Community Health Workers	×			×	×

“We are taught by the health workers. Before we used to give food to children before they reached 6 months of age because, when they saw other people eat, they became greedy and wanted to eat, but today we understand the importance of EB for the first 6 months. We are instructed by health workers, nurses at the Health Centre, and during our gathering for village kitchen activities. Giving hard food to a child before this age is dangerous because its stomach is not yet adapted to this kind of food.” (W-30, month 6)

Social support from family members

Some women cited the support they received from their caretaker (in some instances serving as the expectant mother’s escort) in getting the baby close to them as a facilitator of initiating breastfeeding within the first hour after birth.

“Because I was not able to sit down and to hold the baby, the caretaker helped me to hold and put the baby on the breast when I left the delivery room.”
(W-7, week 1)

Some other women considered that the support provided by their relatives, including their partners, was very important for their successful breastfeeding and care practices, especially within the first days after birth. The support comprised stepping in to help in performing some household daily duties such as cooking and creating a good environment by providing what was needed by the mother.

“Also, my husband is helping me in cooking and doing other household duties in these early days after delivery.” (W-11, week 1)

Discussion

This study aimed to gain insights into prenatal maternal feeding intentions, the reasons behind these intentions, actual practices, and factors facilitating or impeding recommended infant feeding practices within the first 6 months of a child’s life in Muhanga district, in Rwanda’s Southern Province. Most mothers had the intention of breastfeeding within one hour and to exclusively breastfeed for 6 months. Most mothers initiated breastfeeding within one hour of birth but throughout the time EB declined due to an interplay of barriers.

Breastfeeding intentions

The majority of participants in our study intended to breastfeed within the first hour after birth and to breastfeed exclusively for the first 6 months. Consistent with other studies in African contexts in Gambia and Ghana [20, 21], our study found that knowledge about the health, emotional, and nutritional value of early initiation and EB advantages served as a strong motivation for women's intentions to breastfeed. Health professionals, specifically nurses, were said to be an important source of knowledge to support the mother's EB intention to breastfeed within the first hour after birth and to continue with EB for the first 6 months. Our study revealed that 7 out of 39 mothers did not intend to breastfeed exclusively for the entire six-month period because of their unsuccessful past experiences of insufficient breastmilk supply. They believed that they would fail again because of their breasts' anatomical shortcomings.

Breastfeeding practices

The majority of the interviewed women (n=34) were able to initiate breastfeeding within the first hour after birth. However, 27 mothers reported adding liquids, solid foods, and herbal remedies before 6 months. The RDHS 2014–2015 revealed that 81% of children aged 4–5 months were exclusively breastfed, whereas our study found lower percentages of 49% (n=19) and 31% (n=12) of children exclusively breastfed at 4 and 6 months of age, respectively. This difference may be due to different methodologies used. The RDHS used the 24-hour recall method to determine EB practices. This means that infants who were given other liquids regularly may not have received them in the last 24 hours before the survey, may have led to overestimation of the actual proportion of exclusively breastfed children.

Barriers to, and facilitators of, breastfeeding practices

Our study has found that women face a number of challenges in maintaining EB. Perceived breastmilk insufficiency in the quantity needed to meet children's hunger needs was cited by women as the primary reason to interrupt EB and introduce other liquids or semi-solid foods. This practice does not follow the WHO recommendations [22]. Researchers cited similar concerns about breastmilk insufficiency as a common reason for early discontinuation of EB in many other countries, including Kenya [23], Tanzania [24], Zambia [25], South Africa [26], and India [27]. In the present study, the perception of breastmilk insufficiency may be explained by women's lack of confidence in their body's ability to produce adequate breastmilk. Women believed that an infant often crying or taking an interest in others eating were indications that the

child was not getting enough from breastmilk and needed additional food. Although according to Gatti these signs might be part of an infant's feeding cues, they can also be normal infant behavior [28].

In addition, participants linked insufficient breastmilk to poverty-driven food insecurity. Women reported not producing enough food items to cover their needs and having limited financial means to buy food items at the market. Their lived experience of not having enough food for themselves drives the perception of their body's inability to produce sufficient breastmilk. Studies of food insecurity in Ghana and Kenya, respectively, suggest that food insecurity undermines maternal confidence, which in turn may negatively affect EB duration [29, 30]. The impact of food insecurity on EB needs be further investigated, but efforts to promote EB in the study setting should consider addressing the issue of mothers' poverty-driven food insecurity to ensure their good nutritional status and health.

Women's heavy workload, including daily household duties and farming activities, decreases the amount of time mothers allocate to breastfeeding. This may be explained by limited social support for the mothers, especially from their male partners, in reducing their overload of household chores. Similar results have been found in studies in Rwanda [31] and Uganda and Bangladesh [32, 33]. Efforts to help women reallocate time to feeding and childcare in this context are therefore needed.

During the first 4 months of a child's life, right from the first week, mothers reported giving their babies herbal remedies believed to treat or provide protection against perceived illnesses of the baby such as colic, stomach pains, and coughing. Although this practice interferes with EB, mothers did not consider this as interrupting EB. This finding is similar to the existing literature, which suggests that the provision of herbal remedies in the first 6 months is a common practice in Sub-Saharan African countries such as Zimbabwe and Ghana [34, 35].

In our study, some mothers reported adding other food, especially between 4 and 6 months, and herbal remedies during the first months of a child's life, advised by mothers-in-law and older sisters. Similar findings have been found in studies in Zimbabwe, Ghana and Nigeria [34-36]. Some other mothers reported that their mothers-in-law supported EB practice. In Ghana, Aguree et al. [37] observed that mothers-in-law with appropriate knowledge on the importance of breastfeeding tend to encourage mothers to practice EB. Therefore, interventions focusing on mothers without considering their family members may fail.

In our study, we found that knowledge about the benefits of early initiation and EB was a key factor for maternal commitment to breastfeed. Mothers reported receiving knowledge and advice from health professionals on the early initiation of breastfeeding and EB during antenatal care visits and postnatal periods. These findings are in line with studies in Kenya, Zimbabwe, Ethiopia, and Tanzania, which showed that counselling about breastfeeding during antenatal and postnatal care was significantly associated with EB for infants less than 6 months old [38-42]. Furthermore, our findings show that CHWs played a critical role in providing health and nutrition education during the postnatal period. Most mothers reported to receive health and nutrition education from CHWs during the community growth monitoring sessions and village cooking demonstrations sessions. This supports the findings from other studies indicating that CHWs play an important role in interventions aiming at improving child survival in community [43, 44]. Regardless of knowledge about the benefits of EB, there was still a gap between intentions to practice and actually practicing EB for 6 months. Several other barriers to EB were found, including perceived breastmilk insufficiency, infant hunger cues, influence of significant others, heavy workload, and the mother's poverty and food insecurity. Therefore, a lot still needs to be done by health professionals to support mothers in a way that is closer to the everyday situations - the challenges the mothers face - and to help them to find solutions. In addition, mothers could also benefit from support at household level from CHWs to provide individual support, address the challenges mothers face and build their confidence.

At the same time, some women reported their confidence in their ability to breastfeed as a facilitator of EB. This finding implies that their breastfeeding self-efficacy helped them to persist in the face of, and to overcome, breastfeeding challenges. It is well documented that maternal breastfeeding self-efficacy is a significant predictor of breastfeeding initiation and EB duration and helps to overcome difficulties encountered in breastfeeding [45, 46].

Socio-demographic factors like maternal age, education, employment, and parity are known to be associated with suboptimal breastfeeding practices in developing countries including Tanzania, Uganda, and Kenya [23, 24, 41, 47]. However, the ways in which these factors influence EB practice differ in direction from one setting to another. In our study, the variations within the sample and the sample size were too small to explore their influence on breastfeeding practices.

A key strength of this study lies in its longitudinal nature, minimizing the recall bias that may be associated with cross-sectional studies. As the study was limited to one cohort of females, with a minimal sample size (n=39) in Muhanga district of Rwanda only, the

generalizability of the findings is low. However, generalizability of the findings was not the main aim. In addition, as data saturation was reached during data collection, the findings were sufficient to provide a deeper description and understanding of infant feeding intentions, actual practices after birth, and factors facilitating or impeding EB that allow a judgment to be made about the extent to which the findings are relevant and applicable to similar settings. This study provides a view of mothers attending antenatal consultation at health center facilities. It does not provide information on mothers who do not attend antenatal consultations. Thus, the findings of this study may not be representative of EB in the entire community. Furthermore, participants were drawn from the rural Muhanga district. EB intentions and practices of mothers living in urban settings and with different socioeconomic status should also be further studied. The findings regarding factors that facilitate EB can be considered a grounded indication of a research phenomenon that merits further attention. It would therefore be interesting for future nutrition promotion research to gain insights into learning mechanisms and coping strategies that play a role in shaping the practices underlying good child growth among mothers who beat the odds in adverse circumstances.

Through the lens of the TPB

The TPB provides a framework for understanding what influences mothers' breastfeeding decisions and practices. In this study, mothers' behavior intention related to their intended behavior regarding practicing early initiation of breastfeeding and EB for 6 months. The majority of mothers had positive beliefs about both of these recommendations. These beliefs related to high nutritional value of colostrum, immunological protection from disease, prevention of diseases like diarrhea, mother-child bonding, good growth and better health for the baby. Mothers' beliefs were influenced by their subjective norms, which are based on the perceived social pressure that they feel from their significant others to initiate breastfeeding immediately after birth and to practice EB for 6 months. Mothers identified social pressure from health professionals, nurses, as an important/the strongest influence on performing early initiation and EB for 6 months. Regarding perceived behavior control, a low number of mothers expressed a high level of perceived control. Previous unsuccessful breastfeeding experiences (insufficient breastmilk), disease, and poverty were among the factors that mothers perceived to be out of their control and that they felt they might influence negatively their planned breastfeeding practices.

Given their positive attitude and subjective norms, most participants intended to breastfeed. However, there was a gap between intentions and actual practices. The

observed intention- behavior gap could be explained by the fact that the women's initial intention, assessed during pregnancy, changed throughout the six-month period. Mothers faced a number of challenges that prevented them from performing the behavior they had intended to perform. Challenges included perceived breastmilk insufficiency, belief regarding infant readiness (infant cues), influence of significant others, poverty, and food insecurity. These findings confirm that the TPB is not only an effective theoretical framework for predicting breastfeeding behavior, but also a useful tool for guiding breastfeeding interventions. Therefore, interventions to promote EB should consider helping mothers to develop skills and strategies to deal with the everyday barriers to EB.

Conclusion

The aim of this study was to explore prenatal maternal feeding intentions, the reasons behind these intentions, actual practices, and factors that facilitate and impede EB during the first 6 months of a child's life in Muhanga district, Rwanda. Most participants intended to breastfeed exclusively for the first 6 months. However, there was a gap between intentions and actual practices. Most mothers were practicing EB within the first week but EB gradually declined due to an interplay of barriers ranging from individuals to groups and societal levels. EB promotion interventions should consider supporting and equipping breastfeeding mothers with skills to deal with perceived breastmilk insufficiency and to recognize the true signs of baby hunger cues. Furthermore, important influential family and community members should be targeted so that they will encourage mothers to breastfeed. Finally, interventions that consider addressing the issue of poverty-driven food insecurity should not be overlooked either.

Recommendations

The way health professionals and CHWs support mothers is important and they are doing a good job, but still it is not sufficient. Additional actions are necessary to help mothers overcome successfully the everyday challenges of EB:

- Educating mothers about the physiology of breastmilk production in order to address their beliefs about their breasts' anatomical shortcomings
- Informing women about how to recognize the true signs of baby hunger cues
- Targeting male partners' involvement in caregiving and other household responsibilities traditionally performed by mothers

- Involve other important influential family and community members in EB promotion interventions
- Integrating self-efficacy-enhancing strategies into healthcare professionals' dialogue with mothers during the antenatal and early postpartum periods.

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Appendix 3.1: Content of the interview guides

Period	Questions
Pregnancy	<ul style="list-style-type: none"> - How do you intend to feed your expected baby: (You walk through the baby's ages and discuss how they intend to feed the baby and with what) <ul style="list-style-type: none"> • After birth? • During the first three days after delivery? • During the first month (after the first three days) • Between 1 and 6 months of age? - How long after birth do you intend to breastfeed the baby for the first time? - How long do you intend to feed your expected baby with breast milk only? - Why did you think you would feed your baby this way?
First week	<ul style="list-style-type: none"> - For this new baby (the name of the baby), how long after birth was she/he breastfed? - [If less than one hour] What do you believe are the advantages of breastfeeding the baby within the first hour after birth? - What factors or circumstances enabled you to breastfeed the baby within the first hour after birth? - [If more than one hour] What factors or circumstances made it difficult for you to breastfeed the baby within the first hour after birth? - Was the baby given (by you or anyone else) anything to eat/drink before he/she was breastfed for the first time? - [If yes] What was given to the baby? - Why was it given to her/him? [Ask for each food/drink that was given to the baby] - Who advised you to give this to the baby? [Ask for each food/drink that was given to the baby] - At the moment, from birth till now, has the baby been given anything to eat or drink other than breastmilk? - What was given to the baby other than breast milk? - What was the reason that triggered you to offer your baby (drink or/food item)? - Who advised you to do that?

Appendix 3.1: Continued

Period	Questions
4 months	<p>Now let's talk about how the baby was fed after these few days. Please think back from the first week through the first few months:</p> <ul style="list-style-type: none">- Are you currently breastfeeding the baby? If yes, how often do you breastfeed?- Do you breastfeed 1) on a fixed schedule, or 2) each time the baby asks to be fed, or 3) depends on the mother's availability? <p>If not, at what age of the child did you discontinue breastfeeding? Why did you stop breastfeeding the baby?</p> <ul style="list-style-type: none">- What type of food was given to the baby; if any, what were the reasons that triggered you to offer your baby _____ (drink or food mentioned)?- How did you learn about that? Did you learn it from someone?- From the last visit, in the first week postpartum, till now, did you make some changes in the ways you feed your baby? If yes, what did you change?- Did you have any problem or challenge (internal or external) impeding the ideal breastfeeding practices for your child? For every problem, probe to talk more about the problem.- What elements do you believe help you to overcome those challenges? Is it something inside you (physical, mental, or spiritual) or something outside yourself (social and physical context)?
6 months	<p>Now let's talk about how the baby was fed after these few months. From the last visit in the fourth month till now, did you make some changes in the ways you feed your baby? If yes, what did you change?</p> <p>Probing questions:</p> <ul style="list-style-type: none">- Are you currently breastfeeding the baby? If yes, how often do you breastfeed?- Do you breastfeed 1) on a fixed schedule, or 2) each time the baby asks to be fed, or 3) depends on the mother's availability? <p>If not, at what age of the child did you discontinue breastfeeding? Why did you stop breastfeeding the baby?</p> <ul style="list-style-type: none">- Have you given any food/drink to your baby in addition to breastmilk?- If yes, what was the first food given to your baby?- How old was your baby when you gave him/her this particular food or drink? If food was introduced before 6 months, ask why.- How did you learn about that? Did you learn it from someone?- Did you have any problem or challenge (internal or external) impeding the ideal breastfeeding practices? For every problem, probe to talk more about the problem.- What elements do you believe help you to overcome those challenges? Is it something inside you (physical, mental, or spiritual) or something outside yourself (social and physical context)?

Chapter 4

Qualitative, longitudinal exploration of coping strategies and factors facilitating infant and young child feeding practices among mothers in rural Rwanda

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This chapter is under review as Qualitative, longitudinal exploration of coping strategies and factors facilitating infant and young child feeding practices among mothers in rural Rwanda

Abstract

Background: Mothers in low income countries face many challenges to appropriately (breast) feed their children in the first year such as poverty, food insecurity and high workloads. However, even in the lowest income families there are mothers who strive and succeed to feed their children according to the recommendations. In this paper, we explored the coping strategies that facilitate appropriate breastfeeding and complementary feeding practices among rural Rwandan mothers from birth to one year of a child's life.

Methods: Mothers (n=17) who followed the recommended infant and young child feeding (IYCF) practices were selected from a larger sample of 36 mothers who were interviewed within the first week, at four, six, nine and twelve months postpartum. In the analysis, coping strategies and factors facilitating coping were extracted for the 17 mothers who managed to follow the recommended IYCF practices.

Results: Coping strategies included mothers' effort to strengthen their diet to improve breastmilk production, balancing work and child feeding, prioritizing childcare, preparing child's food in advance, active uptake of the IYCF recommendations and persistence in overcoming barriers in order to achieve their goals. Some of those coping strategies were shifting overtime depending on the development of the children. Personal factors such as breastfeeding self-efficacy, religious beliefs and perceived benefits of breastfeeding were among the facilitating factors. Additionally, social support that mothers received from family members, other mothers in the community, Community Health Workers (CHWs) and health professionals played an important role.

Conclusion: In challenging contextual conditions, mothers manage to follow the recommended breastfeeding and complementary feeding practices through the interplay of active coping strategies, the feeling of being in control and social support. Nutrition promotion interventions that aim to improve IYCF should consider strengthening mothers' capability in gaining greater control of their IYCF practices and the factors facilitating their appropriate IYCF practices.

Background

Stunting is a major public health problem especially in many low- and middle-income countries. Globally, the number of stunted children under five has been declining, from 198.2 million in 2000 to 149 million children in 2018 [1]. Despite the worldwide declines, progress in reducing stunting in much of Africa has been slow [1, 2]. Africa is the only region that has seen an increase in the number of under-five stunted children, from 50.3 million in 2000 to 58.8 million in 2018 [2]. The burden of stunting is most prevalent in Eastern African region, where the number of children under five years of age with stunting rose from 21.5 million in 2000 to 24.0 million in 2018 [1]. Stunting is associated with a large burden on health and development of a child that may extend to adulthood. Stunted children are more likely to have an increased risk of morbidity and mortality as well as to experience poor cognitive performance and educational attainment [3, 4]. Factors that contribute to stunted growth and development in infants include, amongst others, poor infant and young child feeding practices. Appropriate IYCF practices are those that follow the World Health Organization (WHO) recommendations of early initiation of breastfeeding, followed by exclusive breastfeeding (EB) for the first 6 months and introducing complementary feeding timely and adequate in amount, frequency and variety at 6 months of age with continuing breastfeeding up to 2 years or beyond. Inadequate breastfeeding practices, including late initiation and non-exclusive breastfeeding hold back the adequate intake of energy and nutrients from breastmilk [5], which increases the child's exposure to undernutrition and in the end may lead to stunted growth [6]. Also the critical role played by inadequate complementary feeding in the origin and progression of stunted growth is widely recognized [7]. Studies in different settings indicated that the likelihood of being stunted was higher among children who started complementary food either before or after the recommended 6 months, and in children whose diet was not diverse and whose feedings were below the minimum (age-dependent) frequency [7-9].

In Rwanda, the prevalence of stunting among children under five years of age has decreased from 44% in 2010 to 38% in 2015 [10]. However, the reduction of stunting is still of a slow pace despite the Government of Rwanda's effort to reduce its prevalence, particularly in children living in rural area (41% stunted) [10]. Recent research showed that inadequate IYCF practices contribute to stunted growth among Rwandan children under the age of five years [11, 12]. In our previous studies on factors that impede appropriate breastfeeding and complementary feeding practices, we found that mothers encounter several challenges for appropriate IYCF practices, including

mother's perception of breastmilk insufficiency, adverse breastfeeding experience, health concerns for the mother and the babies, excessive workload for the mother, poverty, food insecurity, and lack of support from significant family members [13].

So far, research on IYCF practices has mainly focused on identifying factors that impede appropriate practices. Knowing these risk factors has improved child nutrition status, however in a limited way. The risk-oriented approach fails to consider that individuals also possess, or have access to protective resources, which may reduce the likelihood of adverse outcome either directly or indirectly [14]. Without ignoring the importance of this risk-oriented approach, we argue that mothers can find ways of dealing with those risks. Therefore, instead of looking at the determinants of inadequate IYCF practices, in this study we take a different, but complementary perspective by studying factors that relate to coping strategies for appropriate IYCF practices.

Coping strategies refer to behavioral and cognitive efforts made by individuals to manage stressful situations [15], enabling the individual to perceive some sense of control over the stressful situations. According to Lazarus and Folkman's theory of coping (1984), two types of coping strategies can be distinguished: problem-focused strategies and emotion-focused strategies. Problem-focused strategies are efforts to target the cause of stress in practical ways to eliminate the stressor [15], for instance taking control of the stress (e.g. problem solving), or seeking information or assistance in dealing with the situation. Emotion-focused strategies involve managing the emotions associated with the situation rather than changing the situation itself [15]. However, emotion-focused coping is often less effective because it does not provide a long-term solution to deal with a stressor. As mentioned before, in everyday life, mothers face IYCF challenges which result in stressful situations. Despite these challenges, some mothers manage well to follow the WHO recommended IYCF practices. The present study aimed to explore the coping strategies that facilitate appropriate breastfeeding and complementary feeding practices among Rwandan mothers from birth to one year of a child's life. Gaining insights into coping strategies can offer valuable information for interventions aimed at fostering health and add to the current risk informed measures.

Methods

Study design and setting

This study is part of a larger study on IYCF practices during the infant's first year of life in the context of rural Muhanga district, southern province of Rwanda. A qualitative,

longitudinal methodology using in-depth interviews was chosen to prospectively explore the dynamic nature of the coping strategies and factors that facilitate coping for the maintenance of the recommended IYCF practices. The qualitative approach provided a suitable methodology for exploration of the complex situations that mothers faced in relation to IYCF practices and the factors influencing their decision-making. The study was conducted between December 2016 and April 2018, in the catchment area of two rural health centers facilities, Rutobwe and Buramba in Muhanga district, approximately 49 km south of Kigali City, the capital of Rwanda. Considering that the main activity is agriculture (for 76% of the households), it is also the main source of income though 90% of the total production is used for consumption. While 39.1% of Rwandan population were found below the poverty line, Muhanga district was one of the best performers because it had reduced the poverty headcount from 53.6% in 2010 to 30.5% in 2013 [16]. Despite of that, the 2014/15 Rwanda demographic and health survey (RDHS) found that 41.6% of children under age 5 were stunted in Muhanga district, which is higher than the national average of 38% [10].

Study population and sampling procedure

Expectant mothers in their last trimester of pregnancy, visiting governmental health centers, Buramba and Rutobwe, from Muhanga district, were contacted as they were queuing for prenatal care. The study objectives and procedure were explained to those expectant mothers by trained field researchers. Signed informed consents were obtained from those who agreed to participate in the study. A total of 60 expectant mothers were willing to be involved in our study. With a purposive sample of 39 pregnant mothers who came first, data saturation was reached, and additional inclusion was stopped. Inclusion criteria for the study consisted of being pregnant in the last trimester of pregnancy with no serious obstetrical conditions. Women who did not plan to live in the study area with the baby during the first 12 months of the child's life were excluded from the study.

Data collection and measurement

Data collection was conducted by the first author, assisted by a trained field assistant. The field assistant was recruited in a competitive process and had received two weeks intensive training in addition to having some experience in qualitative data collection. Data were collected by means of qualitative in-depth interviews. After recruitment, pregnant mothers were asked to complete a structured quantitative questionnaire on basic sociodemographic characteristics comprising information about marital status,

ability to read and write, education level of the mother, main occupation and number of children. At subsequent visits, in the home of participants, within the first week after birth, at 4th, 6th, 9th and 12th months postpartum, in depth interviews were used to explore the current feeding practices, reasons for adopting particular feeding practices and factors that influence infant feeding. Between the first interview during the first week and the fifth interview at 9 months, 2 of the 39 mothers recruited were lost during follow-up (1 refusal, and 1 moved). Thus, a total of 37 women were interviewed at 9 months. From 9 months to 12 months, 1 mother was lost again during follow up (moved to another area). The interviews lasted between 30 and 60 minutes. Data for a total of 36 mothers who completed all six moments follow-up until 12 months of child's age were analysed.

The interview guides were developed by the research team and were piloted with mothers of young children attending nutrition rehabilitation at health centers and adjustments were made accordingly. The interview guide comprised questions about the initiation of breastfeeding, EB since birth until 6 months and continued breastfeeding until one year. From 6 months of age, the interview guide captured aspects of complementary feeding, including dietary diversity and the frequency of feeding. Questions included the kind of foods that were given to the child and the number of times the child was fed semi solid, solid or soft foods other than liquids during the day and night in the previous day of the interview. To capture the factors that influence the ease or difficulties mothers faced in feeding their children in general, questions were included about factors that impeded or facilitated feeding practices and how mothers dealt with these factors. **Appendix 4.1** summarizes the content of the interview guides.

Ethical consideration

Ethical approval to conduct this study was obtained from the Institutional review board of the College of Medicine and Health Sciences in Rwanda (Approval notice: No 058/CMHS IRB/2016). The study staff explained the purpose of the study and procedures to mothers both verbally and in writing. Then, informed written consent was obtained from every participating mother prior to interviews. Mothers were assured that their participation was voluntary, confidential and that they were free to withdraw from the study at any time.

Data analysis

Descriptive analysis of the quantitative information about sociodemographic characteristic and infant feeding patterns over the first 12 months of child's life was conducted

using SPSS to generate frequencies. Mothers were classified as practicing EB if they fed their infant only breastmilk from birth (apart from prescribed oral medicines and oral rehydration solutions) until 6 months of child's life. Timely introduction of complementary food was considered as the provision of liquid, semi solid foods or soft foods in addition to breastmilk from the age of 6 months.

The audio recordings of qualitative data collected by use of in-depth interviews was transcribed verbatim and some of the interviews have been translated into English to ensure correct coding by English speaking authors. First, we identified the major challenges faced by participants (n=36) for appropriate breastfeeding and complementary feeding practices. Results have been published elsewhere [17]. In order to identify the coping strategies and the factors that facilitated coping for appropriate breastfeeding and complementary feeding practices, in this study we focused attention to mothers who followed the recommended IYCF practices from birth until 1 year of child's life. The analysis was performed for a sample of seventeen (n=17) mothers who complied with the IYCF recommendations.

Data were analyzed using Atlas.ti software (version 7.5.10). Thematic analysis was applied following Braun and Clarke's protocol [18]. The analysis process started with reading the transcripts several times to ensure the accuracy of the transcription and to gain an overview of the content. The first author checked the transcripts for quality against the original recordings and against the field notes taken by a trained field assistant. This was followed by the coding stage. The codes identified features of the data considered pertinent to the research questions, i.e. with a focus on coping strategies and factors facilitating coping. Furthermore, attention was given to searching, reviewing and defining major themes from the findings. The first author, who is bilingual, applied the codes and then grouped the codes into major themes in English for all the Kinyarwanda transcripts. Following the first author's coding in English of the Kinyarwanda transcripts, a colleague with experience in qualitative research co-coded a few of the transcripts independently, followed by a discussion and agreement on the different codes. Quotations were tagged by "W-1 to W-36" representing women codes (1 to 36 women who completed the study) and by "month" indicating the specific month the interview was conducted during the first 12 months of child's life.

Results

Characteristics of the study participants at the beginning of the study

Table 4.1 shows the characteristics of the complete sample of study participants and the characteristics of the participants of the sub-sample concerning the current analysis. Among the 17 participants of the current analysis, the majority were aged above 30 years (n=12), living with partners (n=16), had the ability to read and write (n=15) and completed primary school education (n=9).

Table 4.1: Socio-demographic characteristics of women interviewed

Characteristic	Total (n=36)	Sub-sample (n=17)
Age of the mother (years)		
< 21	2	1
21–30	12	4
>30	22	12
Marital status (with partner)	32	16
Ability to read and write (yes)	34	15
Education level of the mother		
Illiterate	2	2
Primary incomplete	17	4
Primary complete	15	9
Secondary incomplete	2	2
Main occupation (farming)	36	17
Average number of children	2.3	2.1

Overview of the results

Data analysis revealed that mothers who followed the recommendations during the first year of child's life used various problem-focused coping strategies to manage the everyday IYCF challenges. Coping strategies included mothers' effort to improve their own diet for adequate breastmilk production, balancing work and child feeding, prioritizing childcare, preparing child's food in advance, active uptake of the recommendations and persistence in overcoming barriers. Data analysis also indicated personal and social factors that facilitated coping. Personal factors (intrapersonal factors that facilitated coping with challenges) included beliefs about benefits of breast feeding, self-efficacy, and religious belief while social factors (contextual factors in the form of social support on which participants relied to cope with challenging situations) consisted of support from family members, other mothers in the community and advice of Community Health Workers (CHWs) and health professionals. Below we describe the different

coping strategies and facilitating factors. To illustrate themes, typical quotations from participants were translated from Kinyarwanda (mother tongue) into English.

Coping strategies for appropriate breastfeeding and complementary feeding practices

Make effort to improve their own diet for adequate breastmilk production

The majority of participant mothers perceived their own diet to be linked to the quality and quantity of breast milk. In the first week, most mothers perceived their diet to be appropriate to support adequate breastmilk production. From 4 months to 6 months, those who managed to exclusively breastfeed reported to try their best to improve their diet to support the production of adequate breastmilk to satisfy the infant.

“I try my best to get porridge and to eat a balanced diet so that by the time the baby will breastfeed he will get adequate breastmilk.” (W-26, month 4)

Balancing work and child feeding and prioritizing child feeding

Some mothers described the way they deal with their heavy workload by trying to balance work and child feeding by reducing the time they spend to other tasks and prioritizing childcare first, including breastfeeding and complementary feeding, between 4 and 12 months.

“Tasks never end; I only mix them with caring for the child. No rural mother can find time to care for a child exclusively, people are always busy even during dry seasons, so I try to find a way to do the work and take care of the child.” (W-34, month 4)

“Workload is not a big challenge. In my case, I reduce it and fulfil my responsibility of childcare first including feeding.” (W-8, month 12)

Mothers reported to be active and resourceful in the face of poverty and financial constraint challenges. Most of the participants reported to engage in income earning coping strategies and non- income earning coping strategies. It is worth noting that most mothers do not use a single strategy but a combination of strategies. The major reported income earning coping strategy included home production of food (farming) and sometimes selling agricultural produce to earn money and buy other food items from the market.

“I do not have a job from which I can get a salary. I grow crops, but our harvest depends on the weather. When it is favorable, we get a good harvest, but if I

produce sweet potatoes or beans, I have to take some to market so that I can buy something else that children need like fruit or rice.” (W-24, month 12)

In addition, most of the respondents reported to engage in short-term income earning coping strategy by casual labor work such as cultivating, planting, weeding and harvesting in the plots of well –off neighborhood. This coping strategy was predominantly reported from 4 months until 12 months.

“I, personally, am very poor, fortunately it happens that I work in the plots of well off people in the neighborhood and I get money or food for the child.” (W-18, month 9)

Respondents also cited small animal rearing and selling as income earning coping strategy in case of food shortage as well as looking for small business opportunities such as making and selling handcrafted mats and baskets, selling avocados or bananas to earn money and buy food items.

“I also keep a hen and I can sell eggs or chickens and I can buy flour for porridge or baby’s foods in case of food shortage.” (W-24, month 9)

“Sometimes I buy avocados or tomatoes and resell them and I use the interest to buy the infant’s food like fruits and keep the capital for further investment. For instance, if I make 1000 Rwandan francs (Frw) I can use 500 Frw and save the remaining.” (W-18, month 12)

Reported non income earning strategies included borrowing money from mothers saving and lending groups, eating less preferred food by other family members and favoring children for certain foods.

“As for complementary feeding, sometimes it becomes not easy to get food, however one has to try and get food for the infant. For instance, we are belonging to women’s saving groups, in case of food shortage; I borrow money and buy food for the infant. Nothing can preclude me from caring for my infant.” (W-13, month 12)

“When I have got a little money, I buy a half kilo of rice and prepare some grains for the child when I can’t find it for the entire family. I cannot let my child suffer from hunger; I prepare a few spoons for the child and keep another portion for his next meals.” (W-32, month 12)

Mothers' anticipatory behaviors

Participants also talked about taking prior actions such as preparing baby's cereal in advance and taking it to the farm as baby food provision or preparing much food to keep a reserve for the next feeding. Those strategies were said to facilitate mothers to feed their babies on time during the complementary feeding period.

"Sometimes I prepare baby's cereal in advance, early in the morning and take it to the farm. For instance, if I breastfeed the bay at 6:30 in the morning, I give her the cereal around 9:00 because she gets hungry at this time instead of waiting until my return back home to prepare lunch meals." (W-34, month 9)

Active uptake of the recommendations

Participants reported to actively implement the recommended practices based on the advice they receive from their trusted source of information including health professionals and CHWs.

"We receive the advice and teachings from health center professional that we have to introduce other foods to our babies from 6 months, in addition to breastmilk and that foods should be pureed. Therefore, we try to put into practice what we hear from them for the well-being of our babies". (W-26, month 6)

Persistence in overcoming challenges to achieve their EB goal

Despite difficult circumstances, some mothers expressed their EB related goal and their persistency in overcoming challenges. This was mainly reported between 4 and 6 months when mothers faced challenges including the child's interest to food while seeing others eating, pressure from family members to introduce some liquids or food before 6 months as well as mother or child's ill-health. Those mothers reported to be more persistent and to stick to their goal and actively seeking for problem solving strategies. For instance, one mother said:

"My goal is to exclusively breastfeed my baby for his first 6 months from birth. However, as he grows up he expresses envy to eat as he observes others eating. I usually respond to that challenge by isolating the baby whenever I or other siblings are going to eat but what happens is that he sometimes refuses. What I started doing hence forth was not to let the baby stay in own room while we all go and take our meal but rather I used to stay with him

and not eat until his siblings are finished to eat and join him to keep his company.” (W-15, month 6)

Many of the mothers reported not to give up and to stand up against the wrong recommendations.

“The challenge was that since last time you visited our home I have been sick of malaria. My husband and mother-in-law advised me to give cow’s milk to baby and I said no, I cannot give it to the baby before he turns 6 months.” (W-1, month 6)

“I do not give up; I try to find a solution whatever the problem is because if I gave up it would affect the child’s health.” (W-34, month 6)

Changes in coping strategies overtime

Mothers’ coping strategies changed depending on children’s needs. The analysis of the different points in time provided a view of how the mothers’ ways of coping strategies changed over time depending on the needs of children during the first year of life. For instance, during the first 6 months, mothers tried to improve their own diet and eat more food for increased adequate breastmilk production, while after 6 months during the complementary feeding period, they made sure infants get the best food out of what was available.

Factors facilitating coping of the mothers

Personal factors

Awareness and belief about the benefits of breastmilk

Most mothers were aware of the benefits of breastfeeding. They mentioned that breastfeeding allows for the bonding between the child and the mother and that it promotes good growth. Specific to EB, mothers were aware that EB for the first 6 months reduces the child’s risk of diarrheal disease.

“It is that mother’s affection and love, even when I feel weak I have to make an effort and I breastfed her even while lying on the bed and put her closer to me so that she could feel me and recognize me as her mother.” (W-34, week 1)

Maternal self-efficacy

Most mothers who practiced EB for 6 months expressed their feeling of confidence in the ability to breastfeed exclusively right after birth:

“The first one is my knowledge that the baby should depend on mother’s milk only and I have my own breasts, I don’t have to pay for them. The second is the will. I think there is no obstacle, therefore, I will succeed in breastfeeding her, except in the case of force majeure but I don’t expect it, I trust in God.” (W-34, week 1)

Related to maternal self-efficacy was that some mothers reported their previous successful EB experience as a powerful source of their self-efficacy.

“Within the first hour after birth, I breastfed the baby with confidence that she was going to accept it eagerly as it used to be for the older siblings.” (W-36, week 1)

“The baby will be exclusively breastfed until 6 months, because this is not new as I also managed to exclusively breastfeed the older siblings.” (W-01, month 4)

Religion

Participants stated that praying was one of their coping strategies for IYCF challenges including not having enough food for themselves and their children. Belief in God supported them to persist and take active steps towards coping such as working hard. For other participants, they believed that once they channeled their worries to God, they felt relaxed and believed that God would intervene to solve their problems, including not having access to enough food for the family among others.

“Sometimes I face food related challenges. But, once I deeply pray, it helps me a lot as I believe that there is God’s plan for me. I don’t give up instead I keep on working very hard because I know that God will intervene at the right time.” (W-24, month 12)

“When I pray and join praying groups, I convey to God all my worries including not having access to sufficient food, I feel relaxed because I believe God will provide.” (W-10, month 12)

Social factors

Social support

Mothers reported to experience the influences from significant others that were both favorable and unfavorable to EB. Most mothers who managed to exclusively breastfeed under 6 months considered the support provided by significant others (partners, grandmothers and other mothers) as very important for their successful breastfeeding. The support provided by partners comprised practical, financial and emotional support such as stepping in to help in performing some household daily duties such as cooking, creating a good environment by providing what is needed by the mother, extra food provision as well as providing money to buy food items.

“Also, my husband is helping me in cooking and doing other household duties in these early days after delivery.” (W-11, week 1)

“When my partner gets a casual labour, I tell him what is needed for the infant. He doesn’t reject my request; he provides me money and buys the infant’s food item we don’t grow.” (W-20, month 9)

The support provided by grandmothers included performing household daily duties such as cooking and care of other children, especially within the first weeks postpartum. At 6 months, some mothers who practiced EB reported that their family members (maternal mothers) encouraged them to continue breastfeeding. Other mothers (peers) support consisted of the provision of informational assistance to one another through sharing breastfeeding experiences which supported EB for 6 months.

For instance, one mother said:

“By the time I met with other mothers at the health center for child’s immunization at 3 months and a half, EB for 6 months was the focus of our conversation. One mother expressed her concern that her baby wants foods and I said that mine also wants foods. Then another mother encouraged us to make more effort to keep going and delay the introduction until 6 months. Now I managed to do so.” (W-17, month 6)

Mothers also reported to start complementary foods by some specific foods such as porridge and fruits at 6 months because they had seen it being practiced by other mothers.

Advice from health care professionals and CHWs

Most mothers reported to receive IYCF information and advice from health care professionals, nurses, during prenatal education and postnatal period like during the child's immunization on periods.

“When we visit the health center for immunization, we get some teachings by nurses that we should not give anything else to the baby except breastmilk only for the first 6 months and thereafter give the infant other food rich in nutrients and prepared hygienically.” (W-21, month 4)

Furthermore, they reported to receive IYCF information and advice from CHWs during the growth monitoring sessions and village kitchen cooking demonstration sessions on how best to feed their children. The mother below narrates:

“We are educated by CHWs when we meet during village kitchen activities. They tell us that under 6 months infants should only be breastfed and that the mother should eat a balanced diet so that the baby gets adequate breastmilk. In addition, we bring different food items and learn together at that moment how to prepare a balanced diet for our children using locally available food items.” (W-17, month 4)

Discussion

The findings from this study confirm some aspects we found in previous studies that mothers face challenges to appropriately breastfeed their children such as poverty, food insecurity and heavy workload [13, 17]. However, our mothers also showed the ability to cope with those challenges by using different coping strategies. Furthermore, a number of personal and social factors facilitated coping and maintenance of the recommended IYCF practices. Coping strategies included mothers' effort to improve their diet to increase breastmilk production, balancing work and child feeding, prioritizing childcare affairs, preparing child's food in advance, active uptake of the recommendations and persistence in overcoming barriers.

This research has brought forth a number of major lessons. First, mothers do not use a single coping strategy but a combination of short-term and long-term coping strategies. Among short-term coping strategies, for instance, reprioritizing duties by reducing the time mothers spend on other work and prioritizing child affairs including breastfeeding and complementary feeding helped mothers to deal with their daily heavy

workload. Similarly, the importance of reprioritizing duties and prioritize child affairs first has been pointed out by previous studies as a coping strategy to deal with high levels of daily stressors including heavy workload [19, 20]. Additionally, preparing children's food in advance was used by mothers as a way of coping with time scarcity and to allow for a comfortable daily routine, as it was also indicated by another study [21]. Long-term coping strategies involved mothers' engagement in various forms of agricultural activities, such as home food production and selling of agricultural produce to get food or money to buy other food items.

Second, coping strategies change over time depending on the need of children. This finding is in line with the coping theory that presumes that coping is a process indicating a dynamic interplay between the person (mother) and environment [15]. Successful coping involves an ability to adjust and change coping strategies according to the demands of different stressful situations [22] and in a way that facilitates positive outcomes [23]. In our study, mothers tried to improve their own diet for increased adequate breastmilk production during the first 6 months while after 6 months they made sure infants get the best food out of what was available. This finding indicates the ability of mothers to modify their coping strategies as the demands of different stressful situations unfold.

The particular coping strategy an individual chooses to use in a given situation depends on not only the perceived nature of the situation but also on key personal factors [24]. Personal factors including breastfeeding self-efficacy, religious beliefs and beliefs about the benefits of breastfeeding facilitated the capacity of mothers to cope with IYCF challenges. Evidence shows that there is a strong positive association between maternal breastfeeding self-efficacy and EB duration [25]. In our study, by following mothers through the first twelve months postpartum period, we found that perceived breastfeeding self-efficacy was an important personal factor that facilitated mothers' ability to cope with IYCF challenges and to maintain EB breastfeeding for 6 months. Self-efficacy drives one's persistence in the face of obstacle [26]. In line with this assertion, most mothers who managed to follow the recommended practices also discussed their persistence to their EB goal by standing up against inappropriate advice of significant others. Setting a breastfeeding goal played an important role in the actualization of EB for 6 months. There is comprehensive support in the psychology literature that setting a specific goal is critical to goal achievement and that goal setting can be beneficial in health behavior change [27]. The theory of goal setting indicates that one of the mechanisms through which goals influence performance is by directing attention, effort and action toward goal relevant activities at the expenses

of non-relevant actions [27, 28]. In our study, participants mentioned their religious belief as a helpful strategy that strengthened their coping ability under stressful IYCF challenges, including lack of enough food. Similar to our findings, belief in God has been reported in other studies as a resource used by people to shape their everyday lives and to overcome challenges [29, 30].

The majority of those who followed the recommended practices expressed the great appreciation for instrumental and informational support they received from significant others (partners, female family members, peers and other mothers in the study community, CHWs and health professionals). The influence of significant others to adopt recommended IYCF has been reported in different cross sectional studies across different settings [31-33]. In our study, the role of significant others in enhancing coping and maintenance of the recommended IYCF practices was considered as important throughout the first year of child's life. The partner's support in childcare for the interviewees in this study appear to be important, with some partners performing household daily duties including cooking. This finding has not been expressed to this extent in the study community and seems to highlight the father's changing role in family tasks. Most participants reported to make well informed choice based on IYCF teachings and advices from health professionals and CHWs. Existing literature has also shown that access to health and nutrition education during the prenatal and postnatal periods by health professionals [34, 35] and CHWs [36-38] play an important role in promoting breastfeeding and complementary feeding practices. What our research adds to the literature in this area is that it is not only about receiving teachings and advice overtime that play role in adopting the recommended IYCF practices but it is also about doing something with the advice or the teachings, the active uptake or implementation of the advised recommended practices.

Another major lesson is that mothers try to be in control of their IYCF practices and situation within the sphere of influence. People feel in control if they experience a correspondence between a particular cause of action and its outcomes [39]. Once individuals feel that certain outcomes are under their personal control, there is an increased chance that one will persist in performing the behavior [39]. In this specific study, mothers felt some control by experiencing a correspondence between their efforts to cope with challenges and their consistent success in following the recommended IYCF recommendations. Therefore, empowering mothers to gain greater control of their IYCF practices may be important to ensure appropriate feeding of their children. At the same time, despite mothers try to be in control of their IYCF situation, they cannot do it alone because a lot of things are still beyond their control as mothers

are living within the context of multidimensional poverty. Additional measures and efforts are needed to ensure mothers have access to sufficient income, education and sustainable livelihood conditions.

The findings of this study have advanced the state of the art of the coping theory [15]. First, coping is often investigated in terms of its ability to reduce negative outcomes. The current study, however, investigated how coping can also play an important role in increasing positive outcomes. Second, the majority of existing studies on coping strategies are cross sectional and quantitative and do not adequately capture the variability in coping behaviors with time and experience [40]. In this study we were able to examine the variability in coping behaviors with time and experience and how coping supported mothers IYCF practices in a positive way, maintenance of the WHO recommended IYCF practices. As premised by Lazarus and Folkman (1984), coping is an evolving process that changes in response to context, in effort to manage different internal and external demands [15]. The use of coping theory in this study allowed for further confirmation of this statement. In our study, mothers did not perceive IYCF practices as threatening, mothers tried to be in control and therefore mostly used problem-focused coping such as taking control of the challenges by finding strategies to overcome the challenges, gathering information, use of personal abilities as well as focus attention and action towards goal relevant activities (for instance, EB goal). The theory of coping postulates that when stressful situations (in this case IYCF challenges) are appraised by a person (the mother) as controllable by action, problem-focused coping predominates.

It is also important to discuss the limitations of our study. First, the study was qualitative in nature, limited to specific group, excluding generalizations of the findings to all mothers in the entire community and the wider populations. However, generalizability of the findings was not the main aim, as this study rather aimed to obtain detailed and in-depth accounts on coping strategies and factors facilitating mothers to cope, which would not have been achievable with a large sample. Second, our study provides a view of mothers visiting health center facilities for antenatal consultation. It does not provide information on mothers who do not attend antenatal consultations. According to RDHS 2014–2015, although 99% of Rwandan mothers received antenatal care, only 44% of women who had a live birth met the standard of at least four antenatal care visits in 2015 [10]. Third, participants were drawn from the rural Muhanga district. Therefore, the coping strategies and factors facilitating coping among mothers living in urban settings and with different socioeconomic status should be further studied. Another limitation was that respondents would have unknowingly

changed their responses over time to better suit what they saw as the objective of the interviewers. However, the interviewers asked the same questions in different forms as much as possible to check for consistency in the responses. This study also had strengths, including its longitudinal nature to understand the coping strategies and factors facilitating coping, minimizing the recall bias that may be associated with cross-sectional studies. To our knowledge, this is the first qualitative longitudinal study providing insights into the dynamic nature of coping strategies as well as personal and social factors that contribute to success in maintaining optimal IYCF practices.

In our study, we identified coping strategies and factors facilitating mothers to follow the recommended IYCF practices during the first year of a child's life. It would be interesting for further research to gain added insights into these coping mechanisms in different populations, for instance in a group of mothers adhering to the recommended practices but also having children who are growing well despite the everyday challenges mothers face. Exploring this question will be relevant for informing the development of behavior change strategies for health and nutrition promotion to support mothers' capability to direct their IYCF practices in a healthful direction.

Conclusion

Following mothers' infant feeding practices longitudinally provided a powerful methodology to understand coping strategies and factors facilitating appropriate breastfeeding and complementary feeding practices in the first year of a child's life. Our study found that the presence of challenges did not prevent mothers to make great efforts to adhere to the recommended IYCF practices. There was an interplay between coping strategies, personal and social factors in facilitating mothers to adhere to IYCF recommendations. Our study shows that mothers have some sense of control over the IYCF challenging situations and are able to develop a diverse set of strategies to deal with those challenges in order to adhere to the recommended practices.

Recommendations

From the insights obtained in our study, the following key messages for health programs can be formulated:

- Integrating self-efficacy enhancing strategies in antenatal and postnatal education
- Creating a supportive environment such as family and community-wide awareness to provide optimal support to mothers in order to practice the WHO recommended IYCF practices
- Strengthening mothers' capability in gaining greater control of the strategies and factors facilitating appropriate IYCF practices

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Appendix 4.1: Content of the interview guides

Period	Questions
First week	<ul style="list-style-type: none"> - For this new baby (the name of the baby), how long after birth was she/he breastfed? - [If less than one hour] What do you believe are the advantages of breastfeeding the baby within the first hour after birth? - What factors or circumstances enabled you to breastfeed the baby within the first hour after birth? - [If more than one hour] What factors or circumstances made it difficult for you to breastfeed the baby within the first hour after birth? - Was the baby given (by you or anyone else) anything to eat/drink before he/she was breastfed for the first time? - [If yes] What was given to the baby? - Why was it given to her/him? [Ask for each food/drink that was given to the baby] - Who advised you to give this to the baby? [Ask for each food/drink that was given to the baby] - At the moment, from birth till now, has the baby been given anything to eat or drink other than breastmilk? - What was given to the baby other than breast milk? - What was the reason that triggered you to offer your baby (drink or/food item)? - Who advised you to do that?
4 months	<p>Now let's talk about how the baby was fed after these few days. Please think back from the first week through the first few months</p> <ul style="list-style-type: none"> - Are you currently breastfeeding the baby? If yes, how often do you breastfeed? - Do you breastfeed 1) on a fixed schedule, or 2) each time the baby asks to be fed, or 3) depends on the mother's availability? <p>If not, at what age of the child did you discontinue breastfeeding? Why did you stop breastfeeding the baby?</p> <ul style="list-style-type: none"> - What type of food was given to the baby; if any, what were the reasons that triggered you to offer your baby _____ (drink or food mentioned)? - How did you learn about that? Did you learn it from someone? - From the last visit, in the first week postpartum, till now, did you make some changes in the ways you feed your baby? If yes, what did you change? - Did you have any problem or challenge (internal or external) impeding the ideal breastfeeding practices for your child? For every problem, probe to talk more about the problem. - What elements do you believe help you to overcome those challenges? Is it something inside you (physical, mental, or spiritual) or something outside yourself (social and physical context)?
6 months	<p>Now let's talk about how the baby was fed after these few months. From the last visit at fourth month till now, did you make some changes in the ways you feed your baby? If yes, what did you change? Are you currently breastfeeding the baby? If yes, how often do you breastfeed? Do you breastfeed 1) on a fixed schedule, or 2) each time the baby asks to be fed, or 3) depends on the mother's availability?</p> <ul style="list-style-type: none"> - If not, at what age of the child did you discontinue breastfeeding? Why did you stop breastfeeding the baby? - Have you given any food/drink to your baby in addition to breastmilk?

Appendix 4.1: Continued

Period	Questions
6 months	<ul style="list-style-type: none"> - If yes, what was the first food given to your baby? - How old was your baby when you gave him/her this particular food or drink? If food was introduced before 6 months, ask why. - How did you learn about that? Did you learn it from someone? - Did you have any problem or challenge (internal or external) impeding the ideal breastfeeding practices? For every problem, probe to talk more about the problem. - What elements do you believe help you to overcome those challenges? Is it something inside you (physical, mental, or spiritual) or something outside yourself (social and physical context)?
9 months	<ul style="list-style-type: none"> - Now let's talk about how the baby was fed after these few months. From the last visit at 6 months till now, did you make some changes in the ways you feed your baby? If yes, what did you change? <p>Probing questions:</p> <ul style="list-style-type: none"> - Are you currently breastfeeding the baby? - If yes, how often do you breastfeed 1) on a fixed schedule or 2) each time the baby asks to be fed 3) depends on the mother's availability 4) other.... - If not, at which age of the child did you discontinue breastfeeding? Why did you stop breastfeeding the baby? <p>If complementary food was not yet introduced at 6 months:</p> <ul style="list-style-type: none"> - Did you start giving CF to your child? - If the answer is yes, when did you start? What triggered you to start introducing complementary foods at that age? If the answer is no, then ask for reasons - If yes, what was the first food given to your baby? - Why did you decide to start with this particular food? - How did you learn about that? Did you learn it from someone? <p>If complementary food was introduced at 6 months:</p> <ul style="list-style-type: none"> - What triggered you to start introducing complementary foods at 6 months? - What was the first food given to your baby? - Why did you decide to start with this particular food? - Did you change anything in the food given to the child, how and when you feed the child during the last 3 months? If yes, what kind of foods (foods, dishes, drinks) is given to the child of about 9 months? - Are there any foods, dishes, or drinks served only to the child between 6-8 months that is no longer given to the baby at the moment? If so, which types of foods, dishes, or drinks? Why? - How much do you give to your child compared to your own amount (half what you consume, or a quarter)? How do you know that it is sufficient? If you realized it was necessary to increase the amount of food that you give the child, would you be able to do this? What difficulties would you have? What would help you to do this? - How many times did you feed your baby solid and semi solid or soft food other than liquids during the day and night yesterday? How do you know this is sufficient to give _____ times a day?

Appendix 4.1: Continued

Period	Questions
9 months	<ul style="list-style-type: none">- [if the frequency is less than the recommended frequency for the age group] If you are advised to increase the number of times you feed the child each day and you agreed with this, would you be able to do it? What difficulties would you have? What would help you to do this?- [if the frequency is much more than the recommended frequency for the age group] If you are advised to decrease the number of times you feed the child each day, what would be your reaction? Which person would you listen to?- If complementary food is not yet introduced, what factors or circumstances make it difficult for you to provide CF to your baby? Were there any individuals or groups that disapprove or discourage you from providing CF to your baby?- Did you have any problem or challenge (internal or external) impeding the ideal breastfeeding practices and giving CF to the baby? For every problem, probe to talk more about the problem.- What are your current responses to those challenges? For every response, probe to talk more about the response. Are those responses your preferred ones? If not your preferred ones, what would be needed according to you to do this in a better way?- Have you been advised on breastfeeding practices and CF by anyone during the last 3 months, if yes, who and type of advice received from each?
12 months	<p>Now let's talk about how the baby was fed after these few months. From the last visit at 9 months till now, did you make some changes in the ways you feed your baby? If yes, what did you change?</p> <p>Probing questions:</p> <ul style="list-style-type: none">- Are you currently breastfeeding the baby?- If yes, how often do you breastfeed 1) on a fixed schedule or 2) each time the baby asks to be fed 3) depends on the mother's availability 4) other.....- If not, at which age of the child did you discontinue breastfeeding? Why did you stop breastfeeding the baby?- During the last 3 months, did you change anything in the food given to the child, how and when you feed the child?- What kind of foods (foods, dishes, drinks) is given to the child of about 12 months?- Are there any foods, dishes, or drinks served only to the child before that is no longer given to the baby at the moment? If so, which types of foods, dishes, or drinks? Why?- How much do you give to your child compared to your own amount (half what you consume, or a quarter?); How do you know that it is sufficient? If you realized it was necessary to increase the amount of food that you give the child, would you be able to do this? What difficulties would you have? What would help you to do this?- How many times did you feed your baby solid and semi solid or soft food other than liquids during the day and night yesterday? How do you know this is sufficient to give _____ times a day?

Appendix 4.1: Continued

Period	Questions
12 months	<ul style="list-style-type: none"> - [if the frequency is less than the recommended frequency for the age group] : If you are advised to increase the number of times you feed the child each day and you agreed with this, would you be able to do it? What difficulties would you have? What would help you to do this? - Did you have any problem or challenge (internal or external) impeding the ideal breastfeeding practices and giving CF to the baby? For every problem, probe to talk more about the problem. - What are your current responses to those challenges? For every response, probe to talk more about the response. Are those responses your preferred ones? If not your preferred ones, what would be needed according to you to do this in a better way? - Have you been advised on breastfeeding practices and CF by anyone during the last 3 months, if yes, who and type of advice received from each?

Chapter 5

The role of life course learning experiences
in shaping appropriate infant and young
child feeding practices among mothers from
Muhanga district, Rwanda

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Abstract

Background: Most studies about infant and young child feeding (IYCF) practices are often perceived as an individual choice depending on mothers or caregivers' knowledge or attitudes and are focussed on why mothers fail rather than why some mothers feed their children well. However, the role of life course experiences in IYCF is not much investigated. This study applies the Salutogenic Model of Health (SMH), taking a life course perspective, to gain insights into women's life course learning experiences shaping appropriate IYCF practices during the first year of child's life in a rural district of Rwanda.

Methods: From a larger longitudinal study comprising 36 mother-child pairs, 14 mothers who had succeeded to follow the recommended IYCF practices and whose children were growing according to the World Health Organization (WHO) growth standards at one year of age were selected. Narrative inquiry was used through in-depth interviews based on the timelines designed by mothers exploring key moments and experiences in their lives in relation to IYCF practices.

Results: The results indicate that appropriate IYCF practices result from individual and contextual factors exposed to throughout the life-course. Positive social interaction with parents or grandmothers during childhood such as sharing meals and the accompanying enjoyable atmosphere, parental role models for dietary choices as well as cooking skills gained by participating in household food preparation played a role in shaping appropriate IYCF practices. Negative experiences during childhood also had a positive influence on IYCF practices for some participants as they managed to convert those life course constraints into learning opportunities. Motherhood increased mothers' sense of responsibility over their children's health and nutrition and served as internal motivation to apply appropriate IYCF practices. Moreover, participants' participation in community cooking classes as well as role models of appropriate IYCF practices were revealed as avenues that enhanced/enabled their learning through positive interactions and encouragement.

Conclusion: Mothers base their IYCF decisions and choices on a range of factors including social and personal experiences throughout their life course. Early, positive and repeated experiences with healthy feeding practices have a positive influence on later IYCF practices. Therefore, nutrition promotion interventions should not only focus on increasing knowledge but also facilitating mothers to reflect on earlier experiences.

Introduction

Optimal infant and young child feeding (IYCF) practices including the initiation of breastfeeding within one hour of birth, exclusive breastfeeding (EB) for 6 months and continuation of breastfeeding for up to two years and beyond combined with age appropriate complementary feeding, have great potential for reducing child malnutrition and thereby contributing to a reduction of child mortality rate [1, 2]. IYCF practices are often perceived as an individual choice depending on mothers or caregivers' knowledge or attitude [3] and most IYCF studies focus on exploring why mothers or caregivers fail rather than on why some mothers or caregivers manage to have healthy IYCF practices. This view tends to ignore the interaction between individuals (in this case mothers) and their environment [3] and consequently that IYCF practices (both unhealthy and healthy) are learned, supported and expressed within the dynamics of everyday context in which mothers live [4]. As a result, the way in which mothers actively deal with their contexts to manage optimal IYCF practices is not well understood. The lack of attention for social, cultural and historical contexts in which health-related behaviors including IYCF practices are built has been commonly addressed in the literature [4-6]. When IYCF practices are studied without considering contextual influences, the relevance and applicability of recommendations in mothers' everyday life is limited and may be ineffective [4].

The Salutogenic Model of Health (SMH) developed by Antonovsky [7] can greatly support addressing the above knowledge gap. The SMH acknowledges the active role of people in creating health and that health develops from the interaction between people and their everyday life context [8]. Antonovsky's view of Salutogenesis began with his findings, that some people stay healthy despite the influence of a many risk factors. He made this observation following a study of female Holocaust survivors, some of whom were found to be well adapted, despite the severe experience in concentration camps and poor life conditions after immigration to Israel [9]. His question was not why some of these women felt miserable (i.e. what causes disease?), but rather how some of them managed quite well (i.e. what creates health?). Antonovsky viewed health not as a state but as a dynamic move along a continuum, referred to as the ease/dis-ease continuum [10]. Along the life course, human beings are confronted by stressors (challenges) and learn to identify and apply resources that enable them to cope in either a health promoting or health damaging manner [7]. If people deal successfully with the stressors, they can maintain their health or move towards the ease end of the continuum. Unsuccessful coping with stressors can lead people to a movement towards the dis-ease end of the continuum [7, 10]. The SMH has two central concepts:

Generalized Resistance Resources (GRRs) and Sense of Coherence (SOC) [11]. The GRRs are resources within the individuals (e.g. attitudes, self-efficacy, knowledge) or in their environment (e.g. social support) that can be used to counter or to cope with the stressors of everyday life. The GRRs provide one with sets of meaningful, coherent life experiences which are characterized by consistency, a balance between overload and underload and participation in shaping the outcome [12]. The ability to recognize and use these resources in a way that promotes health is the meaning of the second central concept: the Sense of Coherence [13]. Individuals with a strong SOC are better able to identify resources and use them in order to combat the everyday stressors in a health promoting way. Those with a strong SOC have the feeling that life is comprehensible, manageable and meaningful. Life experiences are defined as experiences when people learn how to deal with life in general and acquire problem-solving skills which helps to shape one's SOC [12]. Life experiences characterized by consistency, an underload-overload balance of stimuli and participation in shaping outcomes contribute to the development of a strong SOC and allow one to reach out in any situation and use the resources to deal with stressors (challenges) [12].

In line with the SMH, the central question in this particular study is 'why do some women manage to feed their children well despite their poor living conditions?' Because of the role of life experiences within the SMH, it is important to consider the life course perspective when studying food related behaviors, such as IYCF practices. From a life course perspective the sequence of socially defined events and roles over time play an important role [14]. The life course perspective proposes that exposures to social, behavioral factors as well as life experiences through the entire life span influence health related practices and health outcomes in current and future generations [15]. The life course research approach takes into account the history and path dependency (the dependency of later developments on previous ones) of the development of practices over time and links the practices to the dynamics of the social and cultural environmental contexts in which the individuals live [16]. Life course research applied to nutrition-related health practices helps to understand how past experiences interact with the current environments to enable or limit current food practices or choices [17, 18]. Hence, the life course of mothers has consequences on their food practices. For instance, a mother's life experiences during childhood and adulthood may have an influence on the way she manages to provide adequate nutrition to her children. Yet, there is still limited research documenting life course experiences driving appropriate IYCF practices among mothers living under adverse circumstances. Such an understanding could be of substantial practical value to health

promotion practitioners in revealing existing contextual influences that promote good child nutrition. Apart from the practical value, such understanding can have a scientific value by providing knowledge about the salutogenic factors /mechanisms indicating the way in which individual mothers deal with their context to manage appropriate IYCF practices. The aim of this study was to gain insights into mothers' life course learning experiences that play a role in shaping appropriate infant and young child feeding practices during the first year of child's life in a rural district of Rwanda.

Methods

Study site

This study was conducted in the district of Muhanga located in the southern province of Rwanda between December 2018 and February 2019. Muhanga district is one of the districts affected by the high levels of stunting among children under five years old. The Rwanda Demographic and Health Survey 2014/2015 found that 41.6% of children under age 5 were stunted in Muhanga district, which is slightly higher than the national average of 38% [19]. This study was specifically conducted in the catchment area of two rural health centers facilities, Rutobwe and Buramba.

Participants

Our study is part of the larger longitudinal research that involved 39 mother-child pairs to explore actual breastfeeding and complementary feeding practices and influencing factors from birth until one year. For our study, we selected a specific group "doing well" out of the 39 mothers including those mothers having complied with a minimum of the recommended IYCF practices and whose children were growing according to the World Health Organization (WHO) growth standards at one year of age. The selection was based on 2 criteria: (1) following the recommended practices and (2) good growth of the child. The minimum of the recommended IYCF practices included initiation of breastfeeding within one hour of birth, EB for the first 6 months, continued breastfeeding at one year, and timely introduction of complementary foods at 6 months. Furthermore, we used anthropometric measures that were collected as part of the larger study to check that the children were growing well. Recumbent lengths of the children were taken at birth and then monthly up to 12 months postpartum with respect to standardized procedures. We calculated height-for-age difference (HAD), defined as the difference in observed height and median height of a child of the same age/sex

from the WHO 2006 growth standard [20]. Using individual linear regression with HAD as dependent and age as independent variable, we defined a child as positive grower when having a beta-coefficient being zero or significantly ($p < 0.05$) positive reflecting growth according or above the standard. A total of 14 mothers complied with the above two criteria, and their respective Community Health Workers (CHWs) confirmed the selected 14 months as “doing well”.

Data collection

Narrative inquiry consisting of systematic listening to people’s life stories and providing access to peoples’ life experiences [21] was used to collect information about participants’ life course experiences that played a role in shaping their appropriate infant feeding practices. Specifically, “Food-Life story” narrative inquiry which recognizes the active role of people in constructing their own life and their eating practices was used to further map out specific life experiences and how people reflected on these experiences in relation to their food practices [8]. During this research, one visual method, the timeline, was employed in combination with in-depth interview. The timeline building was used as a form of graphic elicitation to understand participants’ past experiences and encourages the construction of rich temporal stories and to view understandings and interpretations of how pasts shape presents and futures [22].

Data was collected through 2 consecutive sequences of interviews: preliminary interviews and in-depth interview. First, during the preliminary interviews, participants were given details on how to draw their timeline representing their key life events and past experiences. Participants were asked to think back and to create their personal chronological timeline in which they were free to include all relevant aspects of their life trajectories, key moments and past life experiences with food and child feeding practices. The same opportunity was used to check participants’ demographic and socio-economic characteristics. During a follow-up in-depth interviews centred on the timeline drawn by participants, participants were asked to talk about the timeline and the life experiences noted on their timeline. By probing questions about their timelines, it served as a tool for respondents to tell about their life stories. For instance, why is this life experience important to you? Can you describe what happened? What has this life experience brought to you referring to your child feeding? How does this life experience help you or not to comply with the recommended practices? How did you learn to comply with the recommended infant feeding practices?

Ethical clearance

The study was approved by the Institutional review board of the College of Medicine and Health Sciences in Rwanda (Approval notice: No 058/CMHS IRB/2016). The aim and procedure of the study were explained to all respondents who met the inclusion criteria. Respondents were informed about their right to stop at any stage. Respondents were assured of anonymity and each respondent signed an informed consent form before participating in the study.

Data analysis

The interview recordings were transcribed verbatim and translated from Kinyarwanda into English. Each participant was assigned an identity to guarantee anonymity. The first step of analysis consisted of reading and re-reading of the transcripts to ensure that the participants became the focus of analysis. Second, researchers noted anything striking within the transcripts in the left side margin of the transcripts. Then, more elaborate themes were formed on the right-hand margin from initial comments in the left margin. Examples of these themes are key learning moments and life experiences through the life course highlighted by participants as significantly influencing appropriate feeding practices. Furthermore, researchers searched for connections across themes within each transcript and then across all transcripts. Each subsequent transcript was informed by the previous analysis, but the researchers remained sensitive to new ideas arising from the text transcript. The initial analysis was done by two researchers independently. The two researchers discussed any inconsistencies until consensus on the interpretation was reached. Lastly, the findings were further discussed and challenged in a series of team meetings involving all authors, from which further analytical refinements emerged.

Characteristic of the study participants

Table 5.1 presents the participants characteristics. Their age ranged from 24 to 40 years, with a mean age of 34 years. Most participants were married. All participants, except one, had the ability to read and write. Less than a half of the participants completed primary school education (6 out of 14). The main occupation was agriculture for all participants. The majority of participants had three or more children.

Table 5.1: Socio-demographic characteristics of the study participants

S/N	Participant code	Age of the mother	Marital status	Ability to read and write	Education level of the mother	Main occupation	Number of children
1	KI	33	With partner	Yes	Primary complete	Agriculture	3
2	MB	25	With partner	Yes	Primary incomplete	Agriculture	1
3	MJ	33	With partner	Yes	Primary incomplete	Agriculture	3
4	MV	36	With partner	Yes	Primary complete	Agriculture	3
5	MMT	38	With partner	Yes	Primary complete	Agriculture	3
6	MC	28	With partner	Yes	Primary complete	Agriculture	2
7	NA	32	With partner	Yes	Primary incomplete	Agriculture	2
8	NMC	25	No partner	Yes	Primary complete	Agriculture	1
9	TJ	31	With partner	Yes	Primary incomplete	Agriculture	3
10	UG	39	With partner	Yes	Primary incomplete	Agriculture	4
11	UE	26	With partner	Yes	Secondary incomplete	Agriculture	3
12	UY	41	With partner	Yes	Primary incomplete	Agriculture	3
13	YC	41	With partner	No	Illiterate	Agriculture	6
14	YE	38	With partner	Yes	Primary complete	Agriculture	4

Results

In this section, we start with a brief description of the study participants' characteristics, followed by key moments or events on the timelines as indicated by participants. Next, we elaborate on past food upbringing experiences as well as the influence of motherhood as a major life course transition. Finally, we address learning from others through positive interactions.

Key moments or events on the timelines as indicated by participants

All participants indicated key moments (events) and experiences during their life course that influenced their food practices. Most timelines started from the participants' early childhood until their current motherhood. The narrated moments or events varied from one participant to another. Important moments or events reported as influencing food practices included:

- Death of mother, father, or both parents
- Going to live with grandmother, stepmother or aunt
- Getting responsibility for family cooking at young age (parents going out for work)
- Taking care of baby of older sister or neighbor's at young age
- Sharing meals or eating together with parents,
- Parental examples of preparing foods, both positive (e.g. variety of foods, including vegetables) and negative (monotonous meals)
- Life course transitions such as getting married, getting pregnant and giving birth.

Both positive and negative life experiences and events played a role in shaping the participants' infant feeding practices. For instance, childhood events such as the death of the father or the mother, being raised by stepmother gave rise to stressful situations because they used to eat monotonous diets and sometimes with food scarcity during childhood. However, later in their life course, some mothers managed to convert those life course constraints into learning opportunities, that motivated them to work very hard to be able to feed their children differently.

On the other hand, childhood events including eating together or sharing meals with parents or grandmothers as well as moments where parents were showing good examples of preparing and eating a variety of foods were considered as enjoyable by some participants. As they grew up, for many participants observation of good parental cooking and eating patterns and participation in household food preparation taught them to adopt healthy food practices, including appropriate IYCF practices for their children.

For many participants, getting married, pregnancy and giving birth, especially for the first born, were acknowledged as important events that influenced their dietary practices. Several participants highlighted that during that time the importance of other mothers as role models of appropriate practices became significant references as well as the importance of participation in mothers' social group such as community cooking classes which enabled them to gain skills and receiving advices on child feeding.

Past food upbringing experiences

The influence of dietary practices learnt early in the life course was one major recurring subject throughout most of the interviews. Most participants reported remembering their upbringing with respect to food and emulating some of their parents' food habits as well as what they learned from their upbringing in terms of foods. These dietary practices arose while the participants were living with parents or family members such as older sisters or grandmothers during childhood. Participants mentioned the learning experiences that played a role in their current IYCF practices including parental role models for dietary choices and patterns containing vegetables, repeated exposure to a varied diet containing vegetables, and participation in food preparations when they were young. Participants that had favorable early experiences with food and recalling how their mothers used to prepare diets containing a variety of foods and vegetables described positive trajectories of constant vegetables consumption and vegetables use in their current infant food preparation. Sharing meals with parents was also mentioned as another good experience.

Later on in the interviews, in their narratives, mothers discussed how eating vegetables became a norm and that they are now emulating.

“When I was a child and as I grew up, my mother was the one responsible for food preparation. The meals she cooked were always a mixture of different foodstuffs, and vegetables were the principal component. We always ate together, sometimes we lost appetite because of vegetables and she would persuade us to eat telling us vegetables make children grow well and now I imitate my mother’s practices and feed my child most of the time, a diet containing vegetables.” UE

“When I got a child, I imitated my mother’s practices. My mother used to prepare a separate dish for an infant. For instance, when she was cooking the family meal containing beans and cassava, she could cook a separate meal for the young child made from a mixture of vegetables, irish potatoes and beans.” MB

Participants reported not only to learn from their mothers but also to learn from their family relatives including older sisters. For instance, participants reported recalling and emulating their older sisters' breastfeeding practices.

"When I was young, my older sister got married and she lived close to our residence. After giving birth, sometimes she could leave the child with me and told me not to give it anything because it was too early for him/her to take something. Then I asked her when the child would be given something other than mother's breastmilk. She replied that when the child is 6 months old, she would be given supplementary food." NA

"I took care of my elder sister's young child and learnt many things from her when she gave me instructions on what to do for the child. I used to prepare porridge and feed the baby. I valued the instructions about what I used to do for that child, and I did them for my child." MB

Other participants reported how their early participation in food preparation played an important role in their current IYCF practices.

"I watched how my mother used to prepare meals when I was young, and I started helping her to prepare foods as I grew. Today I imitate what my parent had been doing." NC

The participants grew up in different family situations and therefore their childhood experiences were varied. Some of the participating mothers reported not to continue the food practices they learned during childhood because they considered their childhood food upbringing as a sort of negative example which triggered them to make a change later.

"Therefore, I can't tell you that I had a good experience during my childhood. We never ate to our satisfaction, and sometimes we would steal food where our stepmother had hidden it. We experienced such tough conditions, but God protected us. Thus, I did not experience something positive that I can imitate in raising my child. This made me decide to do my best that my children will not experience a shortage of food like what happened to me." UG

"I did not wish my children to have the same experience like mine. I decided to take care of my child as much as I could. Then when I got my first born, I was prepared to take care of her." MC

Major life course transition: motherhood

Participants discussed how they became more aware of the importance of healthy food and made some changes in their food practices during the transition to motherhood. Motherhood motivated them to think more critically about healthiness of their dietary practices and to make some changes in their dietary practices for the health benefits of their children via one's own diet during pregnancy and the first 6 months of EB. In addition, changes in dietary practices happened later when the child started complementary food in order to provide healthy meals to their children and foods adapted to the child's stomach capacity.

For some participants, the unhealthy experiences such as seeing infants in the neighborhood who have not exclusively breastfed for 6 months prompted them to adopt EB.

"I often see infants who have been fed prematurely suffer from intestinal worms and their belly swell up. It makes a child sickly. Therefore, I decided to be careful with my children's nutrition." UG

For most of the participants, motherhood triggered a sense of responsibility for their children's health, taking an active role. This sense of responsibility encouraged mothers to implement the teachings from the health professionals and community health workers and it increased mothers' obligation and motivation to actively take care of their children including breastfeeding the baby and on time, preparing food by themselves and feeding their children a balanced diet during the complementary food period. Participants felt responsible for their children's health and understood that child feeding plays an important role.

"Taking care of my child is my responsibility. Nobody else can do it for me. I perform my duties as a mother in taking care of my child. I prepare its diet, which I try to make a balanced diet as much as I can, manage hygiene in preparing him/her, feed him/her on time and also breastfeed it on time." TJ

"It is personal responsibility. A mother should take care of her child and not entrust it to other people. She must know the time to breastfeed it, when and the dish to feed it and be responsible and know what their children need and try to find them." KI

"I have to devote a part of my time and spare it for my child. I should have devotion to my child. For instance, during the village kitchen activities, they advise us to use cheap foodstuffs like vegetables and small fishes (indagara)

in our dishes because we cannot afford meat. I try my best to implement the teachings but some of us neglect and do not implement it.” UY

Learning from others: positive interactions

Support from social networks (female family members, peers and older mother from the community, mother groups) played a major role for the practice of EB for the first 6 months and complementary feeding practices. Many participants reported encouragement from other mothers about EB and complementary feeding.

“I managed to breastfeed it for 6 months while I had thought that if I gave him/her food before this age him/her would grow well. I learnt EB from older mothers who practiced breastfeeding. They told me that giving food to an infant before 6 months of age is harmful to its health.” MB

“The importance of those conversations is that my counterparts give me some advice to only breastfeed the child within the first 6 months and give supplementary food after from this age.” NC

Most of the participants participated in community cooking classes:

“We created associations and we taught one another. For instance, I was asking myself about what kind of complementary foods I should introduce to my child for the first time after 6 months. Then I was advised by other mothers to start with porridge.” UY

“Health workers also sometimes teach us how to prepare food for our children. This programme was launched in all villages. We provide foodstuffs and we prepare a mixture of them and give to children. I learn some new cooking skills when I am involved in.” MMT

Discussion

This study extends the qualitative literature on infant and young child feeding by exploring the life course experiences that play a role in shaping appropriate infant and young child feeding practices during the first year of a child's life among mothers in a rural district of Rwanda. This study is among the first studies in applying the salutogenic approach to explore the role of life course learning experiences on IYCF practices in the context of low-and middle-income countries. Three major insights emerge from our study. First, positive and negative life experiences during childhood

played a role in shaping participants' IYCF practices. Life experiences characterized by positive social interaction with their own mothers, family relatives during childhood with regards to food related aspects play a role in shaping appropriate IYCF practices. Negative experiences also had a positive influence on IYCF practices for some participants as they managed to convert those life course constraints into learning opportunities. Second, becoming a mother (motherhood) increases mothers' sense of responsibility over their children health and nutrition and serves as internal motivation to perform appropriate practices. Sense of responsibility is a powerful experience. Third, participants' involvement in community actions such as participation in community cooking classes contributed to successful IYCF practices.

While several studies examine health-related behaviors from a life course perspective, few studies have focused on food and nutrition related behaviors [23]. Among them, some have emphasized on specific foods items whereas others have examined food practices of individuals in certain life stages without considering the whole life course of individuals [24, 25]. Little attention has been paid to examine how health-related behaviors such as IYCF practices develop over a person's life course and how past experiences interact with current context to shape appropriate IYCF patterns. The life course perspective offered a conceptual tool that allowed us to discover the dynamic development of IYCF in the context of everyday life of the mothers and how current IYCF practices of the mothers were shaped by past life experiences.

In this study, childhood contextual influences were in the backdrop of many participants' narratives. Our findings are in line with a previous study about life-course influences on fruits and vegetables trajectories that found that early experiences provide lasting food roots that provide reference points for later comparison [24]. For most of the participants, childhood food upbringing played a role in shaping their subsequent IYCF practices. Most participants remembered about their food upbringing with respect to basic knowledge and cooking skills they acquired from their upbringing. This finding indicates that parents (family) play an important role in the learning process about (in) appropriate practices of their children and that parents may act as resources. Negative experiences sometimes triggered mothers to do things differently for the health benefits of their children. Some participants who did not have pleasurable food experiences during childhood, were able to shape them during adulthood (motherhood) and now managed to do well. This is similar to the results of a study conducted by Swan et al. (2018) to unravel the mechanisms underlying healthful eating, in which they concluded that it is never too late to promote healthful eating as even in the face of adverse experiences, challenges could be overcome later in life [6]. This finding confirms

that life course transitions for example motherhood are occasions when food practices, including IYCF, may be subjected to mothers being more motivated to learn about healthy practices [25]. This is also the case in low-and middle-income countries like Rwanda and therefore the life course transition of motherhood offers a window of opportunity for nutrition promotion interventions.

Becoming a mother (motherhood) increased some participants' sense of responsibility over their children's health and awareness of the benefits of optimal IYCF practices made mothers to be more internally motivated. This finding corroborates the idea of Aschemann-Witzel (2013), who suggested that the period around pregnancy and the transition to motherhood have a positive effect on the feeling of responsibility of the child [25]. Furthermore Sz wajcer et al. (2007) argue that those periods are occasions when women become more aware of the health aspects of nutrition and are more motivated to eat healthy [26]. With this internal motivation, healthy food practices, including IYCF practices become more meaningful to mothers because they are important for the good health of their children. Previous studies found that the health of the child is the most important motive for mothers to manage healthy food practices [27, 28]. Interpreted within the framework of the SMH, increased meaningfulness of appropriate IYCF practices address the motivational component of the SOC. It is the meaningfulness of the life event or experience (IYCF practices in this case) that determine the person's comprehension as well as their willingness to invest resources to succeed [29]. Once individuals are motivated, goal-directed activities are initiated and maintained [30] and through those activities they also learn to identify and use certain resources (GRRs). Therefore, it may be important for health professionals to support mothers in finding meaningfulness of their IYCF practices in order to manage appropriate IYCF practices.

For many participants, participation in community cooking classes was in the backdrop of their narratives. This was particularly important for an increased capacity in cooking by gaining new food preparation skills as well as an increased awareness of food ingredients readily available in their area for complementary feeding. This is in line with a previous study found that participation in community groups of various kinds build individual women's skills and play a key role in making any activity meaningful, comprehensible and manageable [31]. This in its turn supports mothers to develop their sense of agency and thus gain greater control of their IYCF practices. Therefore, there is a need to put more emphasis on encouraging community actions to foster positive food interactions within nutrition promotion.

Role models of appropriate IYCF practices served as a resource for participants in learning and managing appropriate IYCF practices. Previous research has shown that social support had influence on individuals' past and current ways of managing dietary practices [32]. This finding implies that dietary behaviors, for instance IYCF decisions and actions, are learnt, supported and embedded in the social environment [4]. Interpreted within the SMH, social support provides an individual with coherent life experiences [33]. Therefore, health professionals should also focus on the social environment in which mothers live, because the interaction of the mothers with their social environment is important for appropriate IYCF practices.

Through the lens of salutogenesis

As premised by Antonovsky (1987), the foundation of individuals' SOC (coping capacity) is laid during childhood when children have life experiences that are characterized by an underload overload balance, consistency and socially valued decision-making [34]. The use of SMH in this study allowed for further confirmation of this statement. Both positive and negative experiences during childhood contributed to the feeling of mothers that IYCF practices are meaningful, comprehensible and manageable. Still, later experiences during motherhood also played a role. Life experiences that evoked meaningful – a belief that there is a good reason to maintain or care about their IYCF practices – included: participants' sense of responsibility over their children's health and awareness of the benefits of optimal IYCF practices during motherhood. Those life experiences that evoked comprehensibility – the extent to which, during the course of growing-up, messages were clear and there was order and structure rather than chaos in one's environment – were: observation of good parental cooking and eating patterns consisting of a variety of foods and participation in household food preparation during childhood. Life experiences that evoked manageability – a belief that the resources are available to manage appropriate IYCF and that IYCF are within mothers' own control – were having role models of appropriate IYCF practices and participation in community cooking classes. The latter not only played a role in making IYCF manageable but also more comprehensible and meaningful by providing mothers with practical skills in preparing child's food and creating awareness of nutritious food ingredients available in the area or at home. For some participants, negative experiences and events during childhood (for instance the death of a parent) had a positive influence on subsequent IYCF practices as they managed to convert those life course constraints into learning opportunities. The SMH postulates that people are exposed to events that may be considered as stressors and affect health as they can reduce health temporarily but

can also in the long term strengthen people in a way that makes it possible to manage stress in another situations [13].

Strengths and limitations

One of the strengths of this study was the use of a visual research tool of timelines. The use of timelines elicited self-reflection and story-telling among study participants [35]. In such conditions, the interviews were led by what participants marked as important aspects of their past life experiences without interference from the researchers. This study has some limitations as well. First, the study was limited to a specific group of mothers, from one rural geographical location in Muhanga district, Southern province of Rwanda. By focusing on this specific group, our study may be limited in its representativeness in a different study population or across the wider population. Second, the questions were too much focused on nutrition rather than life in general. Consequently, how do women cope in general and how does this relate to how they feed their children. Future research should explore these questions to gain insights into more general health promoting factors along the life course that generates healthy IYCF practices.

Conclusion

The aim of the present study was to gain insights into mothers' life course learning experiences that play a role in shaping appropriate infant and young child feeding practices during the first year of child's life in a rural district of Rwanda. Mothers base their IYCF decisions on individual and contextual factors exposed to throughout their life course. This study has shown that appropriate IYCF practices are learned through past life course experiences. Our study showed that life experiences during childhood that include positive and negative food upbringing played a role in shaping participants' IYCF practices. Our study also revealed that motherhood is a powerful experience that contribute to an increase in mothers' sense of responsibility over their children's health and nutrition and accordingly acted as internal motivation to apply the recommended IYCF practices. Moreover, participants' involvement in community cooking classes as well as role models of appropriate IYCF practices enabled their learning process through positive interactions and encouragement.

Recommendations

The findings of this study have a number of practical implications for nutrition promotion professionals and programs:

- Tailoring food and nutrition advice to the complexity of mothers' life course experiences by creating opportunities for mothers to reflect on their lived experiences and the role of past life experiences on how they deal with their daily lives to manage well IYCF practices (mothers-driven learning) instead of suggesting standard educational messages (one-size-fits-all approach).
- Facilitating food directed learning through community actions, such as community cooking classes where mothers who practiced appropriate practices assume a mentoring role.

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Chapter 6

General discussion and conclusion

Introduction

The overall aim of this research was to identify factors that enable healthy IYCF practices in Rwandan households in order to contribute to the development of solution-oriented strategies for reducing child malnutrition. To achieve this aim, four qualitative studies have been carried out. The first study was conducted among key informants (mothers and fathers of infant aged 0–23 months, grandmothers and community health workers, $n=144$), focussed on a general understanding of IYCF practices, the challenges and the responses towards appropriate IYCF practices in the context in which mothers must live their lives (Chapter 2). Next, an in-depth study has been carried out on factors that impede and facilitate appropriate IYCF practices from the perspective of mothers themselves ($n=39$), specifically during the first 6 months of a child's life (Chapter 3). The third study focused on coping strategies and facilitating factors among mothers who managed to follow the recommended IYCF practices during the first year of a child's life ($n=17$; Chapter 4). Finally, the fourth study focused on unravelling how those mothers managed to do well by exploring the life course learning experiences that play a role in shaping healthy IYCF practices during the first year of a child's life ($n=14$; Chapter 5). We employed the Salutogenic Model of Health (SMH) that, in contrary to pathogenesis (that searches for causes of diseases), focuses on the search for the origins of health [1]. The studies reported in this thesis were conducted in rural areas of the district of Muhanga, located in the southern province of Rwanda.

This general discussion starts with a summary of the main research findings and how these findings inform the specific research questions posed in the introduction of this thesis. The integrated findings are discussed in the context of other scientific literature. Then the added value of the present research is discussed, and methodological considerations are presented followed by conclusions. Based on the integrated findings, implications for practice are discussed and recommendations are offered for policymakers and health professionals that aim to improve IYCF practices. Finally, areas for further research are suggested.

Summary of the main research findings

An overview of the main findings, organized per research question, is outlined in **Appendix 6.1**, and summarized in this section.

Research question 1: What are the perceived challenges towards infant and young child feeding practices and the responses applied to overcome these challenges?

Results from Chapter 2 revealed that according to key informants, most of the mothers in the study community intend to follow the recommended IYCF practices, that is, early initiation of breastfeeding, exclusive breastfeeding (EB) for the first 6 months, and timely initiation of complementary foods, despite struggling with the everyday reality. Results indicated that appropriate IYCF is not only about food practices – paying attention to the quality, diversity and amount of food being offered to children – but also about caregivers’ responsiveness and affection during (breast)feeding episodes. The results suggest that determinants of uptake of recommended IYCF practices are multifaceted. Perceived challenges impeding appropriate IYCF practices included perceived lack of breastmilk, women’s heavy workload, partner relations, living in poverty and food insecurity. Family and social support from community health workers and health facility staff, financial support through casual labour, mothers saving and lending groups as well as kitchen gardens were perceived as the responses applied by mothers to cope with these challenges.

Research question 2: What factors impede and facilitate recommended infant feeding practices during the first 12 months of a child’s life?

The main findings in Chapter 3 indicate that most participants had good intentions about EB for 6 months, however, the majority did not manage to do so. The results confirmed the challenges impeding appropriate IYCF practices as found in study 1, that is, perceived lack of breastmilk, women’s heavy workload, partner relations, living in poverty and food insecurity. Additional factors impeding EB included mothers’ concerns over their infants’ health as well as pressure from family members to introduce other foods before 6 months, including solid foods and herbal remedies to treat abdominal pain for the baby. Furthermore, the results re-confirmed findings of study 1 that social support from health professionals and family members were factors facilitating EB for 6 months. In addition, the results highlighted the importance of knowledge about the benefits of early initiation and EB and perceived self-efficacy, that is, mothers’ confidence in their ability to breastfeed exclusively for 6 months.

Chapter 4 showed that mothers did strive to follow recommended IYCF practices from birth until one year of the child's life despite multiple challenges. Results revealed that an interplay of active coping strategies, feelings to be in control, and social support facilitated appropriate IYCF practices. Coping strategies included mothers' effort to strengthen their diet to improve breast milk production, balancing work and child feeding, prioritizing childcare, behaving in an anticipatory way, active uptake of the WHO recommended IYCF practices and persistence in overcoming barriers. Some of those coping strategies changed overtime depending on the needs of the children. Personal factors that facilitated coping included beliefs about benefits of breastfeeding, self-efficacy, persistence in overcoming barriers to achieve their IYCF goals. Social factors consisted of support from family members, other mothers in the community and advice of CHWs and health professionals.

Research question 3: How do life course learning experiences play a role in shaping infant and young child feeding practices during the first year of child's life?

Chapter 5, with a focus on mothers doing well (following the recommended practices and a good growth of the child), revealed that early positive and repeated experiences with appropriate feeding practices had a positive influence on later IYCF. Positive social interaction with parents or grandmothers during childhood such as sharing meals and the accompanying enjoyable atmosphere, parental role models for dietary choices as well as cooking skills gained by participating in household food preparation played a role in shaping appropriate IYCF practices. For some participants, negative experiences during childhood also had a positive influence on IYCF practices as they managed to convert those life course constraints into learning opportunities. Furthermore, motherhood increased mothers' sense of responsibility over their children's health and nutrition and served as internal motivation to apply the recommended IYCF practices.

Integration and discussion of findings

The results described above provide a deeper understanding of the factors influencing IYCF practices among Rwandan households. The findings indicate that healthy IYCF practices are not only about food related practices but also about mothers' responsiveness and affection during feeding episodes. Furthermore, in everyday life mothers living in rural Muhanga district are faced with challenges towards IYCF ranging from the perceived breastmilk insufficiency, the burden of other responsibilities, poverty and the influence of significant others (Chapter 2, 3). In this thesis it was shown that all mothers

faced one kind of challenge or another (Chapter 3, 4). Challenges are unavoidable because they are ubiquitous in people's everyday life [2, 3]. However, some mothers do not remain passive and are able to understand and to manage successfully the IYCF challenges they face within the context of their everyday lives situations (Chapter 4, 5). First, those integrated findings show that those mothers could exercise their strong sense of agency, which refers to the feeling of being in control of one's own actions [4] and to identify and use available resources to overcome IYCF challenges. This sense of agency results from the combination of intrapersonal factors and the capacity of mothers to develop diverse coping strategies. Intrapersonal factors that facilitated coping with IYCF challenges included mothers' confidence in the ability to breastfeed, self-efficacy, a sense of responsibility over their children's health, and religious belief. Coping strategies consisted of balancing work and child feeding, prioritizing childcare, preparing child's food in advance active uptake of the recommendations and persistence in overcoming barriers. Second, appropriate IYCF practices result from the interaction of mothers with their social environment (interpersonal factors) exposed to not only during motherhood but also during earlier life course stages, for instance during childhood.

The integrated findings from the studies, as shown in **Table 6.1**, provide us with two important topics that are further discussed in the following section, that are, the sense of agency (divided in intrapersonal factors and coping strategies) and the social influence (which can be divided in interpersonal factors and food upbringing experiences).

The role of mothers' sense of agency in dealing with IYCF challenges in the context of everyday life

The integrated findings show that most participating mothers encountered challenges for IYCF practices that are beyond their control. Common challenges included poverty, the burden of other responsibilities, food insecurity and the influence of significant other mothers. Similar challenges for appropriate IYCF practices have been found in other countries of Sub-Saharan Africa such as Kenya, Zambia and Uganda [5-7]. Despite challenges encountered along the way, some mothers were able to successfully overcome them.

If people experience a correspondence between a particular cause of action and its outcomes (i.e. a positive effort-results relation; success experience) they feel in control [8]. The findings from the study on coping strategies for breastfeeding and complementary feeding practices (Chapter 4), revealed that mothers perceived some sense of control over their IYCF practices within their sphere of influence. This feeling of being in control supported mothers in their ability to develop diverse problem-focused coping

Table 6.1: Factors enabling appropriate IYCF practices

Factors	Chapter 2	Chapter 3	Chapter 4	Chapter 5
Sense of agency				
Intrapersonal factors				
Knowledge about the recommended IYCF practices /belief about the benefits of optimal practices	x	x		
Confidence in the ability to breastfeed		x		
Self-efficacy			x	
A sense of responsibility over their children's health				x
Religious belief			x	
Coping strategies				
Balancing work and childcare			x	
Prioritizing childcare including breastfeeding and complementary feeding			x	x
Anticipating: preparing child's food in advance			x	x
Active uptake of the recommendations			x	x
Persistence in overcoming barriers to achieve their IYCF goals			x	x
Social influence				
Interpersonal (Social) factors				
Practical, financial and emotional support from the partner			x	x
Practical support from grandmothers such a performing daily household	x		x	
Informational assistance with other mothers through shared IYCF experiences			x	x
Nutrition teachings and advice from health professional	x	x	x	x
Nutrition information and advice from CHWs	x	x	x	x
Food upbringing experiences				x
- Parental role models for dietary choices and patterns containing vegetables (eating a variety of foods)				
- Participation in food preparations when they were young (cooking skills)				
- Positive social interaction with their own mothers, grandmothers and older sisters				

strategies to overcome the challenges to ensure appropriate IYCF practices. Findings further indicate that coping strategies went beyond nutrition behaviors towards lifestyle and life perspective interlinked with other daily demands as they unfold. For instance, participants applied balancing work and child feeding, prioritizing childcare affairs, and behaving in an anticipatory way when facing with IYCF stressful situations such as time-constraints. This suggests the need for health promotion to extend the focus from food related issues towards more general health promotion issues such as the basic areas of life skills. Life skills are defined as “those skills that enable individuals to deal with the demands and challenges of everyday life like problem solving, creative thinking, decision -making and coping with stress [9]. The relevance of strengthening more general health promotion issues and healthful life orientation in general besides food specific factors was also reported by others [10, 11]. By doing this, mothers are enabled to be more confident that they can cope effectively with the demands of everyday life, where recommended IYCF and overall health will fall into place.

Mothers’ feeling of being in control of their IYCF practices was facilitated by mental (psychological) factors that acted as the motivational factors including confidence in the ability to EB, that is, self-efficacy. The importance of breastfeeding self-efficacy on breastfeeding duration and success have been observed previously in other studies that aimed to explore mothers’ perceptions of factors enabling EB [12, 13]. Self-efficacy affects individuals’ commitments to goals and their persistence toward goals in the face of obstacles [14, 15]. In line with this assertion, our findings indicate that mothers who managed to follow the recommended IYCF practices also pointed out their persistence in overcoming barriers in order to achieve their goals (Chapter 4).

The findings indicate that knowledge of optimal IYCF practices and beliefs about the benefits of early initiation and EB for 6 months were key factors for maternal commitment to breastfeed. Studies conducted in other geographical areas in Rwanda have also demonstrated high maternal knowledge on appropriate IYCF practices [16]. The high knowledge, however, did not necessarily translate into appropriate practices. This is consistent with other studies that indicated that although knowledge regarding appropriate eating behavior is necessary, knowledge on its own is often not sufficient to adhere to the recommendations [17-20]. The findings indicated that it is also about acting upon that knowledge, the active uptake or implementation of the recommended practices. This process implies the capacity to move from acquiring and possessing basic knowledge about IYCF recommendations from experts to applying such knowledge in daily food and feeding practices. Although knowledge about IYCF recommendations was not a big problem, it was also not a big solution.

From the longitudinal study presented in Chapter 3, we also found that most participants intended to breastfeed exclusively for the first 6 months, however there was a gap between intentions and actual practice among the majority of the study participants. This finding is inconsistent with a previous research on the psychological factors underlying the decision to continue EB, which has shown that women more often feed their infant according to the duration they intended to [21]. Other research has found however that, irrespective of good intentions, people may fail to adopt the desired behaviours to move to a healthier direction [22] and to ensure actual goal directed behaviors. Accordingly, the studies in Chapter 2 and 3 revealed that several barriers to EB were found, impeding the majority of participating mothers from practicing EB for the first 6 months as they intended to do. To address the difference between intentions and actual IYCF practices, it will be important to consider the idea of implementation intentions. Implementation intentions refers to “if-then” plans that connect good opportunities to act with cognitive or behavioral responses that are effective in accomplishing one’s goal [23]. Implementation intentions specify both the behavior that one will perform in the service of goal achievement and the situational context in which one will enact it, including possible obstacles or challenges to goal-achievement and how to deal with them [23]. In our particular case, planning of specific actions that mothers will take to achieve their intended IYCF practices and pro-actively set coping strategies in case of a challenge, may have a beneficial influence on performing the recommended IYCF practices. Accordingly, forming a plan about how to deal with the perceived breastmilk insufficiency or how to deal with unwanted (social) influences may have a beneficial influence on performing the recommended IYCF practices. Findings from a systematic review of studies by Adriaanse et al. (2011) confirms the positive effects of implementation intentions on promoting healthy eating behaviors [24].

Social influence of IYCF practices

Beyond intrapersonal factors, IYCF practices and coping with IYCF challenges are shaped by factors in mothers’ living environment. Mothers do not live their lives in isolation and therefore, their IYCF practices cannot be fully understood solely in terms of the above intrapersonal factors. The integrated findings indicate that social factors played a dual role, acting as enablers of appropriate practices for some mothers and as impeding factors for others. As enablers, a combination of social factors that include family and community members facilitated mothers to maintain the recommended IYCF practices (Chapters 2, 3, 4, 5). Partners, female family members, peers, other

mothers in the study community, CHWs and health professionals played a role in the maintenance of the recommended IYCF practices. This finding is in line with a quasi-experimental study by Mukuria et al. (2016) in Kenya, which showed that social support from fathers and grandmothers in terms of financial, physical actions and advice resulted in improvement of some feeding practices [25]. Moreover, a previous qualitative study about the factors that influence the uptake of IYCF practices found that participants emphasized on the role of peers and elder mother support in terms of providing advice as well as making well-informed food choices aided by advice from CHWs on optimal IYCF practices [26].

The findings from the life course learning experiences (Chapter 5) indicate that childhood upbringing provided life experiences which they use in their subsequent IYCF practices. Participants reported to continue some of the food practices they learned from their parents, in particular from their mothers, and knowledge and skills they learned from their upbringing. This is line with existing studies found in the literature, indicating that experiences with food during childhood have an important influence on food practices later on in the life course [10, 27]. This finding accentuates the importance of socially embedded early experiences with food related matters and highlight the need for early interventions.

The integrated findings show that mothers allocate diverse meanings to appropriate IYCF practices. They highlighted that appropriate IYCF is not only about food practices – paying attention to the quality, diversity and amount of food being offered to children – but also about mothers’ responsiveness and affection during feeding episodes. Furthermore, positive social interaction with parents or grandmothers during childhood such as sharing meals and the accompanying enjoyable atmosphere played a role in shaping appropriate IYCF practices. These findings accentuate the social meaning participants attached to positive mother-child interaction in supporting appropriate IYCF practices. Similarly, Bisogni et al. (2012) in a systematic review of qualitative studies argue that people give multiple meanings to healthy eating that reflects their social experiences that are broader than the food composition and health outcome [28]. Other research has also shown that the feeding of infants and young children can be seen as part of a wider set of care practices; the concept of care refers to the practices of caregivers that support the physical, mental as well as well as the social needs of the child [29]. The emphasis on physical needs is apparent in the current IYCF recommendations, overlooking the social embeddedness of IYCF practices. The lack of attention of the pathogenic orientation to the social dimension of health behaviors (for instance IYCF) has been widely addressed in the literature [10,

30]. What our research adds is that healthy IYCF is not only about food practices but also a social activity that is influenced by the social context in which the individuals live their everyday lives and in which IYCF choices are made. This supports the fact that there should be more emphasis on encouraging a positive social interaction and atmosphere within nutrition promotion.

Challenges for healthy IYCF practices beyond mothers' control

Despite that participants' mothers are trying to be in control of their IYCF situation, we should not lose the view that they are living in the context with various challenges beyond their control. The findings from this study in Chapters 2 and 3 indicated the perceived challenges for breastfeeding and complementary feeding practices, comprising the interplay of individual, group and societal factors. At individual level, respondents indicated that one of the major challenge for breastfeeding optimally was the perceived breastmilk insufficiency. This finding is similar to what has been reported by other studies conducted in Sub-Saharan African countries including Kenya, Tanzania and Zambia [6, 31, 32]. Another challenge for appropriate IYCF practices at individual level highlighted by participants was the heavy workload the mother had to meet on daily basis that include farming activities and household chores. Lack of time to care for the child due to various household chores and farming activities has been shown to limit the mother's ability to follow the recommended IYCF practices [7, 33] and to have a negative effect on nutritional outcomes for children [34]. At group level, respondents pointed out the negative influence from female family members (older sister or grandmothers) and other mothers in the community, that consisted of advice to initiate complementary food before 6 months and to provide traditional medicine to the baby. The influence of family members to give the baby other food or traditional medicine is cited as a factor influencing feeding choices in other Sub-Saharan African countries such as Ghana and Zimbabwe [35, 36]. At societal level, participants linked insufficient breastmilk and hence early initiation of complementary food to poverty-driven food insecurity for the breastfeeding mothers to eat. Mothers reported poverty as a challenge that affected their complementary feeding practices as well. Even though most of mothers were farmers, they explained that it was difficult for them to afford complementary foods or to diversify children's diets due to poverty. Poverty -driven food insecurity was found by Burns et al. (2016) in the Democratic Republic of Congo as one of the main barrier to optimal IYCF practices as well [37].

In view of these challenges, supporting mothers to develop their sense of agency and thus gain control of the factors shaping their healthful IYCF practices must co-exist

with measures to (addressing the issue of poverty-driven food insecurity) address economic and social environmental constraints.

The added value of the present research: a salutogenic understanding of IYCF practices

It is especially another focus that gave additional value to the research. The current literature on child malnutrition has been predominantly risk-oriented and disease focused. From this perspective, most studies on child malnutrition have a pathogenic orientation, looking at IYCF practices in relation to their contribution to stunting [38-40] and the determinants of inadequate IYCF practices [7, 41]. A focus on the malnourished child only provides indications of how families fail, but not of how they succeed in maintaining healthy child nutrition in the face of adversity [42]. In addition, most studies on child malnutrition lacked a holistic orientation, including ignoring the contextual and social determinants of IYCF practices. Specific to this study is the application of the Salutogenic Model of Health (SMH) that takes a holistic approach to understand how mothers cope effectively with the everyday-life challenges to IYCF practices in such a way that they maintain the recommended IYCF practices and positive child growth. In line with the SMH, we have represented IYCF as a continuum along which mothers can direct their practices between the positive and negative direction of the ease-dis(ease) continuum, depending on their ability to successfully manage IYCF challenges in their everyday lives (**Figure 6.1**).

According to Antonovsky (1987), it is the motivational component of sense of coherence (SOC) ‘meaningfulness’, of the event that determines people’s comprehension as well as their willingness to invest resources to succeed [43]. Although we did not measure participants’ SOC as it was not our aim, we could perceive that women who managed to follow the recommended IYCF practices, “the doing well”, might have a high SOC. It was not the case that women who successfully followed the recommended IYCF practices had not suffered from any problems or were those who had experienced less IYCF challenges. The integrated findings indicate the primary importance of finding meaningfulness of IYCF practices, the extent to which mothers felt IYCF and associated challenges make sense emotionally, that the demands presented are worthy of emotional investment. The life course interviews showed that motherhood increased participants’ sense of responsibility over their children’s health and awareness of the benefits of optimal IYCF practices made mothers to be more internally motivated. With this internal motivation, appropriate IYCF practices become more meaningful

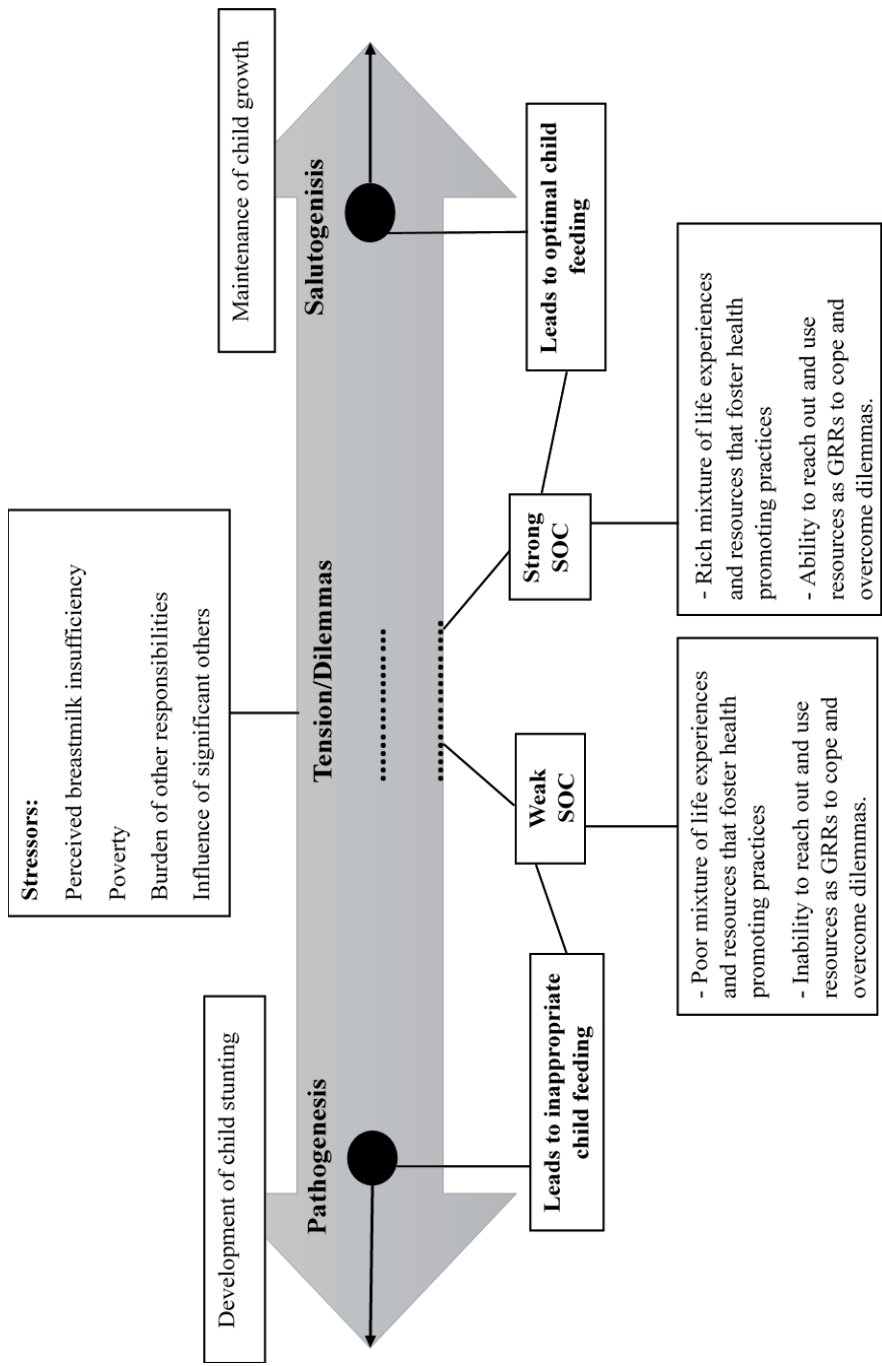


Figure 6.1: A salutogenic perspective of infant and young child feeding practices.

to mothers because they are important for the good health of their children. Once individuals are motivated, coping with the challenges is thereby viewed as a desirable action and goal-directed activities are initiated and maintained [44]. This indicates that, in order to direct mothers towards the positive side of the ease-dis(ease) continuum, it is important that health professionals support mothers in finding meaningfulness of their IYCF practices.

The salutogenic theory suggests that a person needs to mobilize GRRs to deal with the tension caused by a stressor [45]. The integrated findings revealed that mothers showed their ability to identify and use various resources, to deal with IYCF stressful situations or challenges they encountered in their everyday lives. The GRRs were found within people (mothers) as resources bound to their person and capacity playing a role in the effectiveness of their coping strategies. For example, personal factors such as self-efficacy (belief) and persistence in overcoming barriers (ability) were found to support mothers in dealing with IYCF challenges and the maintenance of the recommended IYCF practices. Apart from personal factors, mothers felt that support of significant others (female family members, peers and other mothers in the study community) were important GRRs for appropriate IYCF practices, for example through shared positive infant feeding conversations and encouragement.

Both positive and negative life experiences and events played a role in shaping the participants' infant feeding practices. As premised by Antonovsky (1987), the foundation of an individual's capacity to cope with stressors is developed during childhood when children or adolescents have life experiences that are characterized by an underload-overload balance, consistency and socially valued decision-making [46]. The use of SMH as guiding theory within this study allowed for further confirmation of this statement. Life experiences such as past food upbringing, including observation of good parental cooking and eating patterns consisting of a variety of foods and participation in household food preparation during childhood, played a role in shaping appropriate IYCF practices. It was not only about positive experiences but also some mothers who had negative food upbringing experiences managed to convert those life course constraints into learning opportunities and now managed to feed their children differently. This finding is in line with the SMH that postulates that stressors can reduce health temporarily but can also in the long term strengthen people in a way that makes it possible to manage stress in other similar situations [2]. If people learn to deal with stressors, they consequently move towards the ease side of the ease-dis(ease) of continuum. This indicates that childhood contextual influences were among the factors that determined mothers' ability to manage their appropriate IYCF practices. Still, later

experiences during motherhood for instance, also can shape this capacity to cope with stressors. The learning process was triggered by the reflection on earlier experiences enabling mothers to identify and use the resources they needed for appropriate IYCF practices. These findings suggest that health professionals should consider engaging mothers in a reflective process on their lived experiences on what constitute practical everyday-life evidence about what creates health, what resources are available, the role of life experiences in how women deal with their daily lives rather than the current more emphasis on scientific food-health knowledge.

Taking the SMH perspective enabled us to examine the different coping strategies, GRRs and the life experiences that mothers identify and use to cope effectively with IYCF challenges. First, our study highlights mother's capacity and agency to engage with the everyday IYCF challenges and to apply the different GRRs to successfully mitigate those challenges, in the movement towards the ease side of the ease-(dis) ease continuum. Second, by adopting a salutogenic perspective, we have been able to bring forth a new understanding of the social dimension underlying appropriate IYCF practices, apart from the individual factors. Following the SMH perspective, we can conclude that appropriate IYCF practices is enabled through the interplay between the cumulative learning effect of life experiences and the ability of mothers to reach out and use resources as GRRs to cope with IYCF challenges. This interplay between GRRs and life experiences may have a positive effect on coping and moving towards the ease side of the ease-dis(ease) continuum (see Figure 6.1).

It is important to note that few of the factors indicated in our studies played a dual role, acting as an enabler of appropriate practices for some mothers and as an impeding factor for others. By taking the Salutogenic perspective, we have been able to bring out insights into factors supporting appropriate IYCF practices which are not necessarily contrary to the pathogenic factors. Those factors included self-efficacy, that is confidence in the ability to breastfeed, persistence in overcoming challenges, and mother's sense of responsibility over their children's health. This finding implies that, on top of the factors informing strategies targeting the risk factors for poor IYCF practices, a different set of factors should inform health promoting strategies. Mothers should be supported in their efforts to protect health benefits rather than merely to prevent illness.

What do we know now that we didn't know before?

Many interventions in health promotion aiming at moving people in a more healthy direction act disjointedly on people and the social and physical contexts that support or hinder appropriate practices [22]. For instance, most health promotion interventions aiming at improving IYCF practices have been specifically directed towards strengthening people's intrapersonal factors such as IYCF knowledge, beliefs and attitude. When integrating the research findings, we found factors enabling mothers to cope well with IYCF challenges in other domains. The main findings indicate that appropriate IYCF practices results from the interplay of factors that are: mothers' sense of agency (the feeling of being in control) and the social contextual factors. These factors are not part of current strategies in nutrition promotion. This thesis highlights the facts that taking into account people and their behaviours within the dynamic of the everyday context is a promising lens through which the potential success of any health promotion intervention aimed at improving IYCF practices can be achieved.

Methodological considerations: strengths and weaknesses

To answer our research questions, we used qualitative data from both cross-sectional and longitudinal study designs. These mixed methods employed led to in depth understanding of of IYCF practices in the study community. For instance, in the qualitative cross-sectional study we first identified challenges and responses to IYCF practices as perceived by key informants within the research community. Our first study may not have unravelled all the complexities of IYCF that change with time. Then, in the qualitative longitudinal study, we explored actual feeding practices indicating the factors facilitating or impeding recommended practices as well as the coping strategies for appropriate IYCF practices from birth to 12 months, from the perspective of mothers themselves. The longitudinal design allowed us to capture changes in IYCF practices over time and the factors that participants described as responsible for those changes in the context of their everyday life.

Because of the cross-sectional design in the first study, data might have been disposed to recall bias. Key informants may have over-reported the practices and influences due to social desirability. Grandmothers were the most prone to this bias in the sense that their responses and advice may have reflected cultural beliefs that may compromise appropriate IYCF practices. Nevertheless, the interviewers asked the same questions in different forms as much as possible to check for consistency in the responses. In study 2 and 3,

data was collected in a longitudinal design, among mothers within the third trimester of pregnancy, one week after birth, at 4–6–9 and 12 months, allowing trust creation between participants and field assistants which empowers participants to share their stories and consequentially might have positively influenced the collection of more reliable data [47]. Using different methods for data collection increased the validity of the research findings and offered for a better understanding of the picture of IYCF practices than would have been possible with either the cross sectional or the longitudinal method only.

The timeline method was found to be a valuable tool to explore the life course learning experiences that play a role in shaping appropriate IYCF practices, that otherwise may have been overlooked. As indicated by Sheridan, the great importance of timelining is that it allows participants considerable time for self-reflection and encourages the construction of rich temporal narratives [48]. As such, the timeline minimized the recall bias that would have happened while participants were describing the sequence of events or moments that they perceived as particularly important in their lives over time. Furthermore, since the timelines were created by participants, interviews were not directed by what the researchers felt as important but by what participants themselves perceived as meaningful life course experiences and how they have influenced their subsequent IYCF practices.

A major limitation on this research was that the studies were limited to a specific group of mothers attending antenatal consultation at a health center and residing in one rural geographical location in the southern province of Rwanda, in Muhanga district. Therefore, the findings may not be generalizable to all mothers in the entire community and the wider national populations. However, generalizability of the findings was not the main aim. Qualitative studies offer an opportunity to obtain detailed and in-depth accounts in the case studied (factors enabling healthy IYCF practices), which would not have been achievable with quantitative studies. In the qualitative life course learning experience study, mothers were selected from the larger longitudinal study. Results suggest that those mothers who managed to follow the recommended IYCF practices and whose children were growing well, might have a high level of SOC but we did not measure the SOC. Future research should be carried out to introduce the quantitative based scale of the SOC, with a representative sample size to assess and measure the relationship between the SOC and healthy IYCF practices.

Recommendations

The findings presented in this research revealed promising avenues for salutogenic oriented nutrition promotion strategies to create conducive conditions for appropriate IYCF practices. However, we do not aim to position these avenues as the alternative to the risk-oriented approaches, we just propose a complementary approach that could be worth considering to improving IYCF practices. By using the SMH as a point of departure for this thesis, we are linking to the current debate on enabling a healthy start in life through optimal IYCF practices which is critical to achieving the World Health Assembly's first global nutrition target of 40% reduction in the number of stunted children under five by 2025 in addition to achieving many of the Sustainable Developments Goals (SDGs). Below are recommendations that follow from the integrated findings:

Strengthening mothers' capacity to be in control of life

The integrated findings show that mothers have some sense of control over their IYCF challenging situations by showing their efforts in combatting the food and non-food related challenges they face. There is a need for supporting mothers to increase their potential to cope with any situation. By strengthening mothers' capacity, through participatory approach, their sense of agency can be developed. Super et al. (2015) suggested two processes that may be considered by health promotion activities in order to strengthen people's capacity to cope effectively with the everyday life challenges. The first process consists of empowerment, the concept that is used in relation to the capability of individuals to deal with their own problems [8]. By emphasizing on empowerment, Super et al. (2015) suggested that nutrition promotion strategies should consider enabling people to identify appropriate GRRs that can be used to combat or avoid the stressors or empowering people to mobilize the resources they already have available [49]. The second process consists of reflective learning which is used in relation to the frame through which people perceive the world or ideas that individuals have about the challenges and resources [49]. Through this reflection process, nutrition promotion interventions should consider supporting mothers to see everyday stressful situations as consistent, with a load balance and as socially valuable, this may help them to identify the appropriate GRRs to deal with challenges. This is because mothers' perception about the challenges at hand may support or impede the health promotion effort to empower them in dealing with those challenges. The idea of implementation intention could offer a valuable way to engage mothers in this reflection process.

Our study indicated that coping strategies went beyond nutrition behaviors towards lifestyle and life perspective to meet the different demands of everyday life as they unfold. We therefore recommend that nutrition promotion extend the focus beyond facilitating mothers through food related skills transfer towards a more comprehensive approach encompassing basic areas of life skills such as problem solving, creative thinking, decision-making and coping with stress. Such focus would increase the options available to mothers to exercise more control over their environments and enable them to be more confident so that they can deal with the demands and challenges of everyday life, including IYCF related challenges.

Another important finding was that with regards to participants' perception on coping strategies or resources, divergences may be observed. The perception of a coping strategy or a resource as such is very personal where the same resource could be seen as helpful for one mother but not for another, depending on their situation and their ability to make sense of the situation and to identify and access appropriate resources [50]. This supports the idea of strengthening more general health promoting factors to match the capacities and the needs of different individual mothers.

Acknowledging the social dimension of nutrition in nutrition and health promotion strategies

Our study indicates that appropriate IYCF practices went beyond food related practices for the maintenance of physical health. Mothers considered appropriate IYCF as a way to enjoy and socially interact with the child for the social and the emotional needs of the child. All those aspects were also influenced by the social context in which mothers live their everyday lives. These different roles of appropriate IYCF are in line with the Ottawa Charter of Health promotion, considering health as a positive concept emphasizing the physical as well as the social and personal dimensions of well-being [51]. Therefore, this study shows that it is important for nutrition promotion to take into account all dimensions underlying appropriate IYCF practices and to include them in intervention strategies, in dietary guidelines and other educational messages.

Adopting a participatory approach in designing and providing nutrition and health promotion educational messages

The integrated findings also put to question the 'one size fits all' approach to information provision in which experts (health professionals) suggest educational messages to mothers rather than adapted to their individual needs and contextual understandings.

Mothers should be co-designers of educational messages as they are experts on everyday challenges and solutions which occur when they are trying to follow the recommended practices. Challenges and solutions should be exchanged among mothers and experts, and ways to address the challenges may be formulated together. Their daily life situation should be taken into account when devising nutrition promotion strategies aimed at improving IYCF practices. By adopting a participatory approach, we can also enable empowerment, a process by which people gain control over their lives.

Creating opportunities for positive learning experiences

Past life course experiences with food are instrumental in shaping subsequent IYCF practices. There is a need for health professionals to create environments that provide mothers with the opportunity to reflect on their current practices and the role of past experiences rather than focusing only on providing scientific food-health knowledge. One practical consideration could be to create mothers-led women's support groups where mothers who practiced the recommended IYCF practices, "the positive deviants", assume a mentoring role. For instance, through community cooking classes, stimulating mothers to discuss about everyday problems and solutions, draw their timeline together to explore topics such as: What did you eat as a child and as you grew up? What factors supported you to cope with the challenges you faced? What do you think of eating this or that? Do you know specific moments when you started eating like this or that way? Through these kinds of discussion, the learning reflection is initiated, and mothers learn to identify and use certain resources that are present within their group.

Conclusion

This thesis has shed light on the factors enabling IYCF practices in the context of everyday life of the mothers. The salutogenic model of health has been instrumental in identifying and analysing those factors. Based on the main findings of the overall research, we can conclude that appropriate IYCF practices reflect not only food related practices to support the physical health but also the social and emotional needs of the mother and the child. The results from this thesis reveal that in everyday life, mothers experienced an interplay of barriers and facilitators for appropriate IYCF practices, ranging from individual to group and societal levels. Despite challenges, many mothers do not remain passive, they are able to comprehend the nature of the challenges they face and mobilize the available resources to overcome them. The integrated findings show that having a strong sense of agency (feeling of being in control) is an important factor

supporting mothers' capacity to develop diverse coping strategies even beyond nutrition behaviors towards lifestyle and life perspective to meet the different demands of everyday life. The interaction of mothers with their social environment is also important for the maintenance of the recommended IYCF practices. The findings from this thesis indicate that life course experiences that include past food upbringing experiences and the accompanying positive social interactions offer learning opportunities that enable mothers to identify and mobilize the resources needed to direct their IYCF practices in a health promoting way.

Implication for future research

After studying the factors enabling appropriate infant and young child feeding practices, guided by the Salutogenic Model of Health, several topics have evolved that could be considered for future research. The following recommendations are suggested:

- During the life course interviews, we could perceive that mothers who managed to follow the recommended IYCF practices and whose children were growing well, “the doing well”, might have a strong SOC but we did not measure the SOC. Therefore, more research is required to perform a quantitative research on the topic, for instance by using the quantitative based SOC-scale to assess and measure the relationship between the SOC and healthy IYCF practices to strengthen the case for improving IYCF practices by using the SMH.
- The present study was conducted with a specific group of mothers from one geographical location. We do not know if findings can be generalized to other groups of mothers. Future research can be conducted with study populations that have other sociodemographic characteristics to compare the findings from different study populations. It would be interesting for example to see if the same coping strategies are applicable to different study populations or if other coping strategies could emerge among different population groups.
- The results of the study have shown that it would be relevant to include the concept of implementation intention in research on nutrition and health promotion strategies, specifically for the target group in the presented study, but also for other specific target groups.
- The findings of this study confirm that appropriate IYCF practices involve not only a physical dimension, but also an emotional and social dimension. Prior research

often concentrated on physical health and its relation to healthy eating or feeding. It is needed to take on a more holistic approach of health in further research into this topic

- Finally, future nutrition promotion research should consider the combination of the SMH and the positive deviance approach (PD). The combination of those frameworks may provide an innovative, multi-dimensional perspective towards IYCF. The Positive deviance approach is based on the observation *“that in every community or organization, there are a few individuals or groups whose uncommon but successful behaviours and strategies have enabled them to find better solutions to problems than their neighbours who face the same challenges and barriers and have access to same resources.”* [52]. The PD approach in research consists of four implementation steps that are problem and outcome definition, determination of common practices and existence of positive deviants, discovery of uncommon but successful practices and lastly, development of initiatives to facilitate other community members to adopt the practices [53]. The current PD approach encourages health promoting practices, yet does not address root-causes of the deviant practices [11]. The PD approach may benefit from the multidimensional operationalization of the concept of generalized resistance resources of the SMH. Generalized resistance resources include resources that originate at a range of levels, from individual to and macro-sociocultural levels. In addition, the life-course orientation of the SMH may further enrich the PD approach by incorporating past, present, and future perspectives on challenges and solutions. Furthermore, the two-sided orientation of the SMH towards pathogenic and salutogenic movements on the health continuum allows for a comparative perspective between factors determining good growth (Positive Deviants) and growth faltering (Negative Deviants).

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Appendix 6.1: Summary of the overall research objectives and main findings

To investigate challenges to infant and young child feeding practices and the responses applied to overcome these challenges in Muhanga district, Southern province of Rwanda (Chapter 2)

Methods	Sixteen (n=16) focus group discussions were held with mothers, fathers, grandmothers and community health workers from 4 rural sectors of Muhanga district
Main findings	<p>Most of the mothers in the study community aim to follow the recommended IYCF practices such early initiation of breastfeeding, EB for the first 6 months, and timely initiation of complementary foods. Participants revealed that appropriate IYCF is not only about food practices but also about caregivers' responsiveness and affection during feeding episodes.</p> <p>IYCF challenging situations:</p> <ul style="list-style-type: none">• Breastmilk production is not yet established immediately after birth• Infant cues• Excessive workload• Partner relations• Poverty <p>Factors that contribute to overcoming challenges as identified by key informants:</p> <ul style="list-style-type: none">• Family and social support from community health workers• Social support from health professionals• Financial support through casual labour, mothers saving and lending groups

Appendix 6.1: Continued

To gain insights, in a longitudinal qualitative study, into prenatal maternal infant feeding intentions, the reasons for these intentions, actual practices, and factors that facilitate and impede recommended infant feeding practices during the first 6 months of a child's life in a rural district of Rwanda (Chapter 3)

Methods In depth interviews with mothers (n=39) once during pregnancy, within the first week and at four and 6 months postpartum

Main findings Most mothers intended to breastfeed within the first hour after birth and to exclusively breastfeed for the first 6 months. However, for the majority of respondents there was a gap between breastfeeding intentions and actual breastfeeding practices.

Factors that impeded EB included:

- Perceived breastmilk insufficiency
- Pressure from family members
- Mothers' concerns over their infants' health issues
- Use of herbal remedies for the baby
- Mothers' heavy workload
- Poverty and food insecurity

Facilitating factors consisted:

- Knowledge of the advantages of early initiation and EB advantages
- Confidence in the ability to breastfeed exclusively for 6 months
- Social support from family members and health professionals

Appendix 6.1: Continued

To longitudinally explore the coping strategies and factors facilitating breastfeeding and complementary feeding practices among Rwandan mothers from birth to one year of child's life (Chapter 4)

Methods	In depth interviews with mothers (n=17) who managed to follow the WHO recommended IYCF practices within the first week and at four, six, nine and twelve months postpartum
Main findings	<p>All mothers faced one kind of challenge or another. However, the presence of challenges did not prevent mothers to make great efforts to adhere to the recommended IYCF practices. There was an interplay between coping strategies, personal and social factors in facilitating mothers to adhere to IYCF recommendations.</p> <p>Coping strategies:</p> <ul style="list-style-type: none">• Balancing work and childcare• Prioritizing childcare including breastfeeding and complementary feeding• Behaving in an anticipatory way (preparing child's food in advance)• Active uptake for the recommendations• Persistence in overcoming barriers to achieve the EB goal <p>Personal factors facilitating IYCF practices:</p> <ul style="list-style-type: none">• Breastfeeding self-efficacy• Beliefs about benefits of breastfeeding• Religious belief <p>Social factors facilitating IYCF practices:</p> <ul style="list-style-type: none">• Practical, financial, and emotional support from the partner• Practical support from grandmothers• Informational assistance with other mothers through shared breastfeeding experiences• Anticipatory teachings and advice from health professional• Information and advice from CHWs

Appendix 6.1: Continued**To gain insights into women's life course learning experiences that play a role in shaping appropriate infant and young child feeding practices during the first year of child's life in rural district of Rwanda (Chapter 5)**

Methods Life course in depth interviews with mothers (n=14) who managed to follow the recommended IYCF practices and whose children were growing according to the WHO growth standards at one year of age, timelining

Main findings Life experiences played a role in shaping healthy infant and young child feeding practices. Early, positive and repeated experiences with appropriate feeding practices has a positive influence on later IYCF practices. Motherhood increases mothers' sense of responsibility over their children health and nutrition and serves as internal motivation to perform appropriate practices.

Life experiences**Past food upbringing experiences:**

- Positive social interaction with parents or grandmothers during childhood such as sharing meal and the accompanying enjoyable atmosphere
- Parental role models for dietary choices
- Participation in household food preparation during childhood and as they grew up

Influence of motherhood:

- Motivation to make some changes in their dietary practices in order to create health enhancing environment for the baby
- A sense of responsibility in childcare
- Role models of appropriate IYCF practices
- Participation in community cooking classes

Summary

Although adequate nutrition and good health are children's rights, they are often violated, especially in developing countries where undernutrition is one of the leading causes of mortality among children under the age of five. The problem is more pertinent in Sub-Saharan Africa (SSA), that still suffers from the highest under-five mortality rates in the world. Rwanda does not escape from this sad trend because despite continuous policy efforts, chronic malnutrition (stunting) among under-five remains a key public health concern. The 2014/15 Rwanda Demographic and Health Survey (RDHS) shows that 38% of under-five years old children were stunted in 2015. Hence, the Government of Rwanda has implemented numerous strategies to tackle the problem of chronic malnutrition. However, to date, much of our understanding on child chronic (mal) nutrition has been primarily based on research conducted on the nutritional physiological determinants of stunting such as the timing, composition and frequency of infant and young child feeding (IYCF). This view, however, has lacked a holistic orientation, ignoring the contextual and social determinants of IYCF practices. Moreover, the approach to tackle chronic malnutrition has been predominantly disease and risk-oriented, looking at the factors underlying stunting (pathogenic orientation). From this perspective, IYCF practices have been researched in relation to their contribution to stunting and the determinants of inadequate IYCF practices. Very little is known on factors contributing to good nutritional status, with a particular focus on factors facilitating mothers' appropriate IYCF in the context of their everyday lives.

The overall aim of this thesis is to identify factors that enable healthy IYCF practices in Rwandan households in order to contribute to the development of solution-oriented strategies for reducing child malnutrition. Guided by the salutogenic model of health, which searches for answers to the question what creates health rather than what causes disease, this thesis addressed three specific research questions that are:

1. What are the perceived challenges towards infant and young child feeding practices and the responses applied to overcome these challenges?
2. What factors impede or facilitate recommended infant feeding practices during the first 12 months of a child's life?
3. How do life course learning experiences play a role in shaping infant and young child feeding practices during the first year of child's life?

To address the above-mentioned research questions, the study adopted both cross-sectional and longitudinal designs. The study was carried out in the catchment areas of Rutobwe and Buramba health centres located in a rural part of the district of Muhanga, in the southern province of Rwanda.

Chapter 2 explored the perceived challenges towards IYCF practices, and the responses applied to overcome these challenges. Focus group discussions were conducted among key informants (mothers and fathers of infants aged 0-23 months, grandmothers, and Community Health Workers, n=144) from the study community. The main findings showed that according to key informants, most of the mothers in the study community intend to follow the recommended IYCF practices, that is, early initiation of breastfeeding, EB for the first 6 months, and timely initiation of complementary foods, despite struggling with the everyday IYCF challenges. Results demonstrated that appropriate IYCF is not only about food practices – paying attention to the quality, diversity and amount of food being offered to children – but also about caregivers’ responsiveness and affection during (breast)feeding episodes. The results indicate that determinants of uptake of recommended IYCF practices are multifaceted. Key informants reported that challenges that impede appropriate IYCF practices included perceived lack of breastmilk, women’s heavy workload, partner relations, living in poverty and food insecurity. Family and social support from community health workers and health facility staff, financial support through casual labour, mothers’ saving and lending groups as well as kitchen gardens were perceived as providing support to the mothers to cope with these challenges.

The study in **Chapter 3** aimed to gain insights into prenatal maternal infant feeding intentions, actual practices, and factors that facilitate and impede implementation of recommended infant feeding practices during the first 6 months. In a longitudinal study, in-depth interviews with a purposive sample of 39 mothers (n=39) were conducted, within the third trimester of pregnancy, one week after birth, at 4–6–9 and 12 months postpartum. The results indicate that most participants had good intentions about EB for 6 months, however, the majority did not manage to do so. The results confirmed the challenges impeding appropriate IYCF practices as found in study 1, that is, perceived lack of breastmilk, women’s heavy workload, partner relations, living in poverty and food insecurity. Additional factors impeding EB included mothers’ concerns over their infants’ health as well as pressure from family members to introduce other foods before 6 months, including solid foods and herbal remedies to treat abdominal pain for the baby. Furthermore, the results re-confirmed findings of study 1 that social support from health professionals and family members were factors facilitating EB for 6 months. In addition, the results highlighted the importance of knowledge about the benefits of early initiation and EB and perceived self-efficacy, that is, mothers’ confidence in their ability to breastfeed exclusively for 6 months.

Chapter 4 investigated the type of coping strategies and factors facilitating coping for breastfeeding and complementary feeding practices among mothers from childbirth to one year, in a longitudinal study. Mothers (n=17) who followed the recommended IYCF practices were selected from a larger sample of 36 mothers out of 39 mothers of the second study, who completed all five moments follow-up from child's birth until 12 months of child's age. Mothers of the total group were interviewed within one week after birth, at 4–6–9 and 12 months. In the analysis, coping strategies and facilitating factors were extracted for those 17 mothers who managed to follow the recommended IYCF practices. Results revealed that an interplay of active coping strategies, feelings to be in control, and social support facilitated appropriate IYCF practices. Coping strategies consisted mainly of problem-focused coping strategies that are mothers' effort to strengthen their diet to improve breast milk production, balancing work and child feeding, prioritizing childcare, preparing child's food in advance, active uptake of the IYCF recommendations and persistence in overcoming barriers in order to achieve their goals. Some of those coping strategies changed overtime depending on the needs of the children. Personal factors such as breastfeeding self-efficacy, religious beliefs and perceived benefits of breastfeeding were among the factors facilitating coping. Additionally, family members, other mothers in the community, Community Health Workers and health professionals played an important role in coping for breastfeeding and complementary feeding practices.

Chapter 5 explored the role of life course learning experiences in shaping appropriate infant and young child feeding practices during the first year of a child's life. The study was conducted among 14 mothers out of the 17 mothers from the previous chapter (third study) who successfully followed the recommended IYCF practices and whose children were growing according to the WHO growth standards at one year of age. The main findings showed that both positive and negative life experiences during childhood played a role in shaping participants' IYCF practices. On one hand, life experiences characterized by positive social interaction with parents or grandmothers during mothers' childhood such as sharing meals and the accompanying enjoyable atmosphere, parental role models for dietary choices as well as cooking skills gained by participating in household food preparation played a role in shaping participants' appropriate IYCF practices. On the other hand, negative experiences also had a positive influence on IYCF practices for some participants as they managed to convert those life course constraints into learning opportunities. Furthermore, motherhood increased mothers' sense of responsibility over their children's health and nutrition and served as internal motivation to apply the recommended IYCF practices.

Chapter 6 presents the main findings of the overall research presented in the empirical chapters. The main findings of the overall research show the picture of the interplay of factors that enable healthy IYCF practices among Rwandan households. Based on the main findings of the overall research, we can conclude that in everyday life mothers face challenges when they try to pursue the recommended IYCF practices. The perceived challenges consisted mainly of poverty, food insecurity, heavy workload and the influence of significant others. Furthermore, the results of this thesis show that in a sea of those challenges mothers' sense of agency (feeling of being in control), capacity to develop diverse coping strategies as well as social support are important factors that facilitate to overcome challenges and to follow the recommended IYCF practices. Moreover, the life course experiences such as past food upbringing experiences, having role models of appropriate IYCF practices play an important role in the maintenance of the recommended IYCF practices. In view of these findings, policy makers and health professionals that aim to improve infant and young child feeding practices and thus reducing child malnutrition have to create optimal preconditions for appropriate IYCF practices in which mothers' sense of agency and capacities as well as optimal social conditions are highlighted, enabled and supported. In order to make this happen, this chapter based on the new insights from this research proposes some solution-oriented strategies for nutrition promotion. Those include strengthening mothers' capacity to be in control of life, acknowledging the social dimension of nutrition in nutrition and health promotion strategies, adopting a participatory approach in designing and providing nutrition and health promotion educational messages as well as creating opportunities for positive learning experiences.

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About the author

Curriculum vitae

Jeanine Ahishakiye was born on 1st January 1977 in Nyabihu district, Rwanda. In 2007, she graduated at University of Rwanda, former National University of Rwanda from the department of Education with a Bsc degree in Education of Biology. In 2009, Jeanine Ahishakiye was granted a scholarship by the Belgian Technical Cooperation to pursue her Msc degree at Ghent University, Belgium. She graduated in 2011 with a Master of Science degree in Human Nutrition and Rural Development: Human Nutrition as main Subject. In 2012, she joined the University of Rwanda, College of Medicine and Health Sciences, School of Public Health in department of Human Nutrition and Dietetics as an assistant lecturer. In 2015, The Netherlands initiative for capacity development in higher education offered her a scholarship as a PhD fellow in the department of Social Sciences, Health and Society Chair group, Wageningen University. Jeanine Ahishakiye's focus in the thesis was on understanding the psychological and social physical environment driving infant and young child feeding practices among Rwandan households: a salutogenic approach. During the PhD period she attended several courses and conferences. Her research outputs were presented and published in international and regional conferences and journals. She looks forward to a continued scholarly contribution as part of the global and national endeavor to improve maternal and child health and nutrition.

List of publications

Published and upcoming

Ahishakiye J, Bouwman L, Brouwer ID, Matsiko E, Armar-Klemesu M, Koelen M: Challenges and responses to infant and young child feeding in rural Rwanda: a qualitative study. *Journal of Health, Population and Nutrition* 38, 43 (2019) <https://doi.org/10.1186/s41043-019-0207-z>

Ahishakiye J, Bouwman L, Brouwer ID, Vandrager L, Koelen M: Prenatal infant feeding intentions and actual feeding practices during the first six months postpartum in rural Rwanda: a qualitative, longitudinal cohort study. *International Breastfeeding Journal* 15, 29 (2020) <https://doi.org/10.1186/s13006-020-00275-y>

Ahishakiye J, Vaandrager L, Brouwer Inge D., Koelen M: Qualitative, longitudinal exploration of coping strategies and factors facilitating infant and young child feeding practices among mothers in rural Rwanda. (submitted)

Ahishakiye J, Vaandrager L, Brouwer Inge D., Koelen M: The role of life course learning experiences in shaping appropriate infant and young child feeding practices among mothers from Muhanga district, Rwanda. (submitted)

Conference abstracts

Scientific presentation “Stressors and coping strategies of infant and young child feeding practices in Rwanda: Perceptions of mothers, fathers, grandmothers and Community Health Workers. International Congress of Nutrition IUNS 21st ICN International Congress of Nutrition in 2017. (Oral presentation), Buenos Aires, Argentina, 15–20 October 2017.

Scientific presentation “Prenatal infant feeding intentions and actual feeding practices during the first six months postpartum in rural Rwanda: A qualitative, longitudinal cohort study” 4th federation of African Nutrition Societies (FANUS) conference, Kigali Rwanda (August 2019).

Scientific presentation “Qualitative, longitudinal exploration of factors influencing infant feeding practices among mothers in rural Muhanga District, Rwanda. Nutrition Disparity and Equity: From differences to conference. Wageningen, The Netherlands (November 2019).

Jeanine Ahishakiye

Wageningen School of Social Sciences (WASS)

Completed Training and Supervision Plan

Name of the learning activity	Department/Institute	Year	ECTS*
A) Project related competences			
Creating salutogenic environments: Health promoting Universities, Schools, hospitals, cities & workplaces	ETC-PHHP Summer Course, Italy	2015	8
Nutri-Science: A multifaceted approach to Nutrition Research	VLAG	2015	1.5
Writing PhD research proposal	WUR	2015	6
B) General research related competences			
WASS Introduction course	WASS	2015	1
Information literacy including Endnote introduction	WUR Library	2015	0.6
Qualitative data analysis with Atlas.ti-hands on practical	WASS	2015	1
Scientific writing	WGS	2019	1.2
Production and use of food composition table data in nutrition	VLAG	2015	2.5
<i>'From aspirations to everyday reality: a longitudinal study on mothers' intentions about child feeding and actual feeding practices in rural Rwanda'</i>	WASS PhD day	2018	1
C) Career related competences/personal development			
Career assessment	WGS	2020	0.3
Guest lecture in course HSO 10806	WUR	2015	1
Scientific meetings, seminars, organized within the department/research group	WUR	2015– 2019	3
<i>'Stressors and coping strategies of infant and young child feeding practices in Rwanda: Perceptions of mothers, fathers, grandmothers and Community Health Workers'</i>	21 st IUNS conference 'From Science to Nutrition Security', Buenos Aires, Argentina	2017	1
<i>'Prenatal infant feeding intentions and actual feeding practices during the first six months postpartum in rural Rwanda: A qualitative, longitudinal cohort study'</i>	4 th FANUS conference, Kigali, Rwanda	2019	1
<i>'Qualitative, longitudinal exploration of factors influencing infant feeding practices among mothers in rural Muhanga District, Rwanda'. Nutrition Disparity and Equity conference</i>	Conference 'Nutrition Disparity and Equity: From differences to Potential' Wageningen, The Netherlands	2020	1
Total			30.1

*One credit according to ECTS is on average equivalent to 28 hours of study load.

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