

Barriers and facilitators to the implementation of community health workers' nutrition intervention for stunting prevention in Burera District, Rwanda

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Abstract

Background: Childhood stunting remains a prevalent health issue globally, particularly in low- and middle-income countries including Rwanda. Despite ongoing efforts to improve child health, stunting persists, and there is limited research on the challenges and supports faced by Community Health Workers (CHWs) in addressing this issue.

Objectives: The study aims to explore the barriers and facilitators encountered by CHWs in delivering nutrition interventions to prevent childhood stunting in Burera District, Rwanda, along with the perspectives of mothers and caregivers.

Methods: Using a phenomenological qualitative research approach, the study collected data from five Focus Group Discussions and five Key Informant Interviews. Data were analyzed thematically to identify key themes and subthemes, with the sample size determined by data saturation

Results: Three core themes emerged: barriers, facilitators, and mothers' perceptions. Barriers included technology skills, geography, cultural beliefs, financial constraints, domestic challenges. Facilitators are knowledge, commitment, government support, training, and community engagement. Mothers' perceptions highlighted trust in CHWs, increased nutritional awareness and economic hardships.

Conclusions: CHWs remain resilient despite challenges. The study recommends government investment in CHW training, NGO support for cultural and economic programs, and community participation. Future research should assess the long-term and comparative effectiveness of CHW interventions for stunting reduction.

Keywords: Barriers; Facilitators; Community Health Workers; Intervention; Stunting; Prevention

1. Introduction

Childhood stunting, a chronic form of malnutrition, is a major global public health challenge, affecting 22.3% or 148.1 million children under five worldwide, as per a 2023 UNICEF-WHO report. Africa accounts for 43% of the global stunting burden, with low- and middle-income countries (LMICs) experiencing the highest prevalence. Stunting, caused by chronic malnutrition, leads to developmental delays, cognitive impairments, and long-term health complications, with socioeconomic consequences for both individuals and communities (Mercedes de Onis & Branca, F. 2016).

In LMICs, various factors contribute to stunting, including biological, environmental, and socioeconomic influences. While improved nutrition knowledge and economic independence among mothers can facilitate better child health, barriers like poverty, lack of awareness, and limited community engagement hinder progress (Habtu et al., 2023).

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Community Health Workers (CHWs) play a crucial role in bridging healthcare gaps, especially in regions with high stunting rates like Sub-Saharan Africa. CHWs provide preventive and curative services, making them essential in addressing stunting (Condo et al., 2014; WHO, 2016).

Rwanda exemplifies the challenges and potential of CHW interventions in combating stunting, with 33.1% of children under five still stunted despite progress in child health outcomes (Global Nutrition Report, 2022). CHWs in Rwanda offer various services, including immunization, nutrition screening, and Integrated Community Case Management (ICCM) for childhood illnesses (MoH, 2014). In regions like Burera District, where stunting rates remain high, CHWs face barriers such as geographical isolation and cultural beliefs but benefit from facilitators like community support and training (NISR, 2020).

This study investigates the barriers and facilitators CHWs face in reducing childhood stunting in Burera District through three major objectives: 1) to explore the barriers that CHWs face when implementing nutrition interventions for child stunting prevention in Burera district, Rwanda; 2) to assess the facilitators of CHWs' nutrition interventions in addressing child stunting in Burera district, Rwanda; and 3) to identify the perspectives of caregivers on the implementation of CHWs nutrition interventions for reducing child stunting in Burera., aiming to inform policy and strengthen Rwanda's healthcare strategies. The findings will also contribute to global knowledge on the role of CHWs in tackling childhood malnutrition.

2. Methods

This cross-sectional qualitative study employed a phenomenological approach to explore the lived experiences of Community Health Workers (CHWs) and mothers in delivering nutrition interventions and their perspectives on barriers and facilitators within Burera district, Northern Rwanda. Burera, chosen for its high prevalence of child stunting, comprises 17 sectors, 69 cells, and 571 villages, with a population of 397,754. The district's 2,284 CHWs, organized into teams of four per village, include one female "Agent de Santé Maternelle (ASM)" and two "Binômes" (a male-female pair). The study focused on CHWs involved in nutrition interventions and caregivers of children affected by stunting, using purposive sampling to ensure diversity. Data were collected through five Focus Group Discussions (FGDs) with 6-8 CHWs per group and five Key Informant Interviews (KIIs) with mothers/caregivers, with the sample size determined by data saturation. FGDs explored shared experiences and group dynamics, while KIIs provided in-depth individual insights, all guided by semi-structured interviews, recorded, and transcribed for thematic analysis. NVivo Version 19 software facilitated coding and pattern identification. To ensure quality, interviewers were trained, data collection tools were piloted, and triangulation of CHW and caregiver data was applied. Ethical approval was obtained from MKU's Institutional Ethics Review Committee and Burera district authorities, with participants giving written informed consent and assured confidentiality. Data were anonymized, securely stored, and presented narratively using quotes, thematic matrices, tables, and figures. The findings offer practical recommendations for enhancing community health strategies to address child stunting effectively.

3. Results

3.1. Socio-demographic characteristics of respondents

The demographic data contains gender, age group, education level, occupation, religion, and marital status of respondents. Majority were females and most of them were aged 35 to 44 years. The highest percentage were Catholic, and more than half attained primary education. Most were farmers and were married.

Table 1 Socio-Demographic characteristics of respondents

Variables	Categories	Frequency	Percentage (%)
Gender	Female	36	80
	Male	9	20
Age	24-34	7	15.6
	35-44	29	64.4
	45 and above	9	20

Religion	Protestant	18	40
	Catholic	20	44.4
	Adventist	5	11.1
	Muslim	2	4.4
Education	Primary	23	51.1
	Middle School	18	40
	Secondary	4	8.9
Occupation	Farmer	32	71.1
	Business	8	17.8
	Others	5	11.1
Marital status	Single	0	0
	Married	31	68.9
	Separated	2	4.4
	Widowed	12	26.7

3.2. Overview of core themes, subthemes and codes

Table 1 provides the core themes, subthemes, and categories for the FGDs and KIIs. The core themes are barriers/challenges, facilitators/enablers and mothers/ caregivers' perceptions to the implementation of CHWs' nutrition intervention for stunting prevention. The table 1 bellow explain the identified core themes, core sub-themes and key sub-theme categories (codes) as discussed with participants from both FGDs and KIIs.

Table 2 Core themes, subthemes, and subtheme categories

Themes	Sub-Themes	Subtheme categories (Codes)
Barriers	Technology knowledge	Lack of proper tools (smartphones, specialized equipment)
		Lack of knowledge about digital tools for better reporting and monitoring
		Insufficient equipment and resources
	Geographical barriers	Walking long distances
		Frequency and timing of visits (once a month vs. need for more frequent follow-ups)
	Cultural and Religious Beliefs/Practices	Cultural or religious dietary restrictions
		Misconceptions about family planning and nutrition
	Financial Constraints/ Resource Limitations	Lack of financial support for vulnerable households
		Inability of caregivers to afford recommended nutritious foods
		Poverty and lack of access to nutritious food
Domestic Challenges (Family conflicts)	Domestic conflicts affecting nutrition and caregiving	
	Caregivers' lack of time due to other responsibilities	
	Parental separation, Single-parent households, Child neglect due to family issues	
Facilitators	Knowledge and skills on nutrition behaviours	Increase of nutrition/stunting knowledge
		Hygiene practices

	CHWs Commitment and Dedication	Regular household visits and follow-ups
		Continuous monitoring and education of caregivers
	Local Leadership/Government support	Collaboration with local authorities to improve household compliance
		Policy enforcement
		Availability of special diets and nutritional supplements
	Training and Capacity Building	Positive impact of regular training on CHWs' knowledge and practices
		Increase of nutrition and hygiene practices/awareness
	Community Engagement and support	Mothers' engagement, Community Trust and Support
		Community participation and cooperation
	Communications	Affordable telephone for all CHWs
Free call between CHWs and other healthcare providers		
Mothers Perceptions	Trust and Satisfaction with CHWs	Positive feedback on children's health improvement due to CHWs' interventions
	Increased knowledge and awareness	Enhanced knowledge of nutrition and hygiene practices among caregivers
		Knowledge of proper nutrition, Sources of information (village nutrition school) by CHWs
		Trust in CHWs' teachings, Satisfaction with CHWs' efforts
	Economic Hardships	Financial struggles in providing recommended nutrition
	Campaign and Mobilization	Regular village nutrition school sessions, Home visits, Involvement in children's growth monitoring
		Early intervention for signs of malnutrition, Continuous follow-up beyond initial visits
	Engagement and Support of Community Leaders and Peer	Local leaders in encouraging participation and compliance
		Peer support in adopting and sustaining nutrition practices

The main themes are presented further followed by their subthemes. The findings are described with quotes generated from the FGDs and KIIs.

4. Barriers to the CHWs' Implementation of Nutrition Interventions (core theme 1)

4.1. Subtheme 1: Technology skills/knowledge

Most participants from Kirambo Health Center highlighted that digital tools play a major role negatively to interrupt their performance including walking long distance to reach at health center for reporting as well reaching to stunted children. They claimed that they don't have smartphone, and they don't know how to use them in their daily work. Some of the views expressed were as follows:

"It is difficult for us when you go to work, you need to come on foot and give a report, but if you have technology, you can immediately send it to a certain village to see if there is a work that has happened. The challenges we face such as access to technology are also challenges for us such as providing a quick report, if we have technology, there is a way that you can sit at home like you would jump for about 30 minutes at home and take a picture and send it." (Kirambo HC, FGD₂)

The barriers highlighted by the FGDs respondents emphasize on subtheme category (codes) such as Lack of proper tools (smartphones, specialized equipment), Lack of knowledge about digital tools for better reporting and monitoring, Insufficient equipment and resources, and the availability of digital tools and technology skills can enhance the

community health worker performance to prevent stunting and promote child health in general. They claimed that even they got many trainings but there is no training specifically focused on improving their skills on technology.

"Aside from "MUAC," we don't use telephones, laptops, or other digital tools to assess children's nutrition levels which limit our performance. Previously, we used an SMS alert system for urgent cases, but without digital tools, it's challenging to mobilize timely assistance. Access to digital tools would enable us to respond promptly to urgent cases, ensuring timely interventions for children in need."(Kinyababa HC, FGD₃)

"Digital tools would simplify reporting. For instance, we could instantly share a child's condition with higher authorities, facilitating quicker assistance."(Bungwe HC, FGD₅)

"Regarding digital tools for stunting reduction program, we haven't received training on their use, so we are unaware of their potential impact on our work. Our work in combating stunting and poor nutrition is conducted locally, using simple tools like paper and pen, so may be if we have digital or technological tools will be a great."(Butaro HC, FGD₄)

4.2. Subtheme 2: Geographical and Transport barriers

CHWs are required to travel long distances, often on foot, to reach the homes of the families they serve. The terrain can be challenging, and the time spent traveling significantly reduces the time available for them to attend to their personal responsibilities, such as caring for their own families and managing household tasks like meal preparation and helping children with schoolwork. The effort required to traverse these distances on foot underscores the need for some form of compensation or support to make their work more sustainable and less physically taxing.

"We visit them on foot, although distance and terrain often present challenges. Late returns home can affect our ability to care for our families and attend to children's needs, including school preparations and meal planning. Providing care on foot consumes significant time especially here is a remote area" (Rwerere HC, FGD₁)

There are frequent instances where CHWs are called upon urgently to gather specific reports or take children's measurements. However, the sudden nature of these requests often means that CHWs cannot notify the mothers in advance. This lack of preparation leads to situations where they may miss the families or children they are supposed to visit, resulting in incomplete reports. This challenge highlights the need for better planning and communication to ensure that CHWs can effectively gather the necessary data without wasting time or effort.

"The obstacles we face in our daily work when they call on us suddenly we did not alert the mothers we need to go to each house on foot sometimes we miss them and we find that we only see a few children in the village and we have them then the report is not complete."(Kirambo HC, FGD₂)

Weather conditions, particularly rain, pose a significant barrier to the CHWs' work. Even when appointments are scheduled, unexpected rain can delay their visits, leading to missed opportunities to provide care or hold meaningful conversations with parents. The voice of CHWs highlight significant geographic and transportation barriers faced by Community Health Workers (CHWs) in carrying out their duties. These challenges impact not only the effectiveness of their work but also their personal lives.

"The problem we often have when we go to visit the parents at home is maybe like rain, sometimes when you have alerted the parent that you'll come at eight o'clock by then it was raining, so there was a delay which is a problem, maybe you will wait for a light rain then go there, then appointed time you should have used is gone hence you don't get to have a good conversation and find that it is not going well with the teachings you had prepared, we have the obstacles of to do a long distance."(Bungwe HC, FGD₅)

4.3. Subtheme 3: Cultural and Religious Beliefs/Practices

Historically, cultural and religious beliefs have been significant barriers to the acceptance of nutritional advice. In Rwerere Health Center, participants acknowledged the positive shift in attitudes since the introduction of CHWs. While some beliefs persist, there has been a general improvement in how the community receives nutritional advice. This is a testament to the efforts of CHWs in bridging the gap between traditional beliefs and modern health practices. However, the continued existence of certain beliefs highlights the need for ongoing education and engagement.

"Historically, cultural and religious beliefs posed challenges to our nutritional advice. We struggle to address cultural and religious beliefs through education, encouraging behavior change and emphasizing the importance of monitoring children's growth."(Rwerere HC, FGD₁)

The practice of culture and religion beliefs not only delays proper treatment but can also exacerbate the child's condition and misunderstanding about family planning, hygiene and the causes of illnesses, such as diarrhea and vomiting, further complicate efforts to improve child nutrition.

"There are some places where we meet but there are some community members from some churches who don't participate in the program because sometimes happened on their praying day and insist on feeding their children some food like meat and refuse our intervention based on their religion belief."(Kirambo HC, FGD₂)

Participants revealed that religious beliefs directly conflicted with the roles of CHWs. This experience illustrates the personal and social challenges faced by CHWs when their professional responsibilities clash with their religious and culture practices. It also underscores the broader community tension between health initiatives and religious doctrines.

"Yes, sometimes as parents, they have the feeling that the child will get sick instead of taking him to the doctor and treating him they go among traditional healers, this can cause the child to become infected."(Bungwe HC, FGD₅)

In some cases, religious practices directly limit participation in health programs. The community members may refuse certain nutritional advice, such as the inclusion of meat in their children's diets, based on religious beliefs. The participants discussed the resistance to nutritional advice due to cultural and religious beliefs and the challenges they face when parents disregard medical advice in favor of traditional remedies.

"We often encounter challenges where parents disregard our advice due to their beliefs. For example, some prefer traditional treatments over our recommendations for children suffering from poor nutrition, leading to exacerbated health issues. Some parents attribute their child's condition to natural body size rather than poor nutrition, delaying necessary interventions."(Kinyababa HC, FGD₃)

The discussions also highlighted misunderstandings around family planning and nutrition. Some parents equate family planning with abortion, leading to unplanned pregnancies and subsequent poor nutrition for both the unborn and young children. Additionally, religious beliefs that condone alcohol consumption during pregnancy or discourage meat consumption complicate the efforts of CHWs to promote healthy dietary practices. These beliefs not only affect the health of children but also pose long-term challenges to public health initiatives.

"Some parents believe that family planning equates to abortion, leading to unplanned pregnancies and subsequent poor nutrition for both newborn and young children. Additionally, advising pregnant women to abstain from alcohol is often ignored due to religious beliefs that condone its consumption, despite its harmful effects on fetal development." (Butaro HC, FGD₄)

4.4. Subtheme 4: Financial Constraints/ Resource Limitations

In the Rwerere HC discussion, participants highlighted the challenges faced due to limited financial resources, particularly in promoting healthy dietary practices among families. CHWs stress the importance of teaching parents how to prepare nutritious meals, starting from pregnancy through to the child's early years. However, their efforts are often hindered by the financial inability of many families to afford nutritious foods. Despite these obstacles, they continue to encourage village leaders to organize fundraisers to support parents who are financially unable to provide nutritious foods for their children.

"Financial constraints also hinder our ability to prepare nutritious foods. However, we continue to urge village leaders to organize fundraisers to support parents who cannot afford nutritious foods" ; Limited resources and equipment pose challenges. (Rwerere HC, FGD₁)

Participants from Kinyababa HC and Bungwe HC emphasized how poverty undermines their nutritional advice to parents. While CHWs strive to educate parents on the importance of a balanced diet, financial constraints prevent many families from sustaining these practices. This economic hardship directly impacts the health and nutritional status of children, contributing to ongoing issues of malnutrition and stunting in the community.

"Poverty also affects our efforts. While we advise parents on nutritious meals, many struggle to sustain these diets due to financial constraints, affecting their children's health."(Kinyababa HC, FGD₃ and Bungwe HC, FGD₅)

In Butaro HC, the discussion focused on the families often lack the necessary resources to provide nutritious meals for their children. The term "abasangwabutaka," used to describe certain community members, refers to those who face significant economic challenges, including difficulty in securing regular employment.

"Some individuals in our community, known as "Abasangwabutaka," struggle to secure regular employment and rely on beverages rather than nutritious food for themselves and their children." (Butaro HC, FGD₄)

A particularly concerning insight from the Bungwe HC discussion is the notion that some individuals have children with the intent of receiving financial support, which they sometimes misuse. Instead of using the money to provide nutritious food and proper care, some parents misallocate these funds, resulting in children being vulnerable to malnutrition. All FGDs underline the significant impact that financial constraints and resource limitations have on the ability of CHWs to effectively combat malnutrition and child stunting.

"There are people who still have a sense of giving birth so that they get the money. This is it money even if they give her sometimes, she doesn't spend it on what should be done. In other words, giving money is making children's growth a problem, rising in stunting." (Bungwe HC, FGD₅)

4.5. Subtheme 5: Domestic Challenges (Family conflicts)

The quotes from the FGDs put light on the significant domestic challenges that CHWs face, particularly those related to family conflicts and their impact on child nutrition and overall health.

"Despite facing challenges in managing our household responsibilities and limited government support, we remain committed to our work, advocating for more assistance from the government" (Rwerere HC, FGD₁)

CHWs face substantial challenges at the household level, where family conflicts can severely undermine their efforts. They emphasize the importance of balanced nutrition during pregnancy and advocate for exclusive breastfeeding, understanding that proper nutrition from the start is key to preventing child malnutrition. However, these efforts are often complicated by the domestic realities in which these families live.

"Children from families experiencing conflicts are vulnerable to malnutrition. When parents separate, leaving children with one parent who may not prioritize nutrition, this can lead to malnutrition. Poverty also contributes to malnutrition, but we advocate for families in need, providing vegetables, milk, or other foods to combat malnutrition." (Butaro HC, FGD₄)

Participants emphasize that reaching out to families in need, but it harder for them to provide timely support to families experiencing conflicts, who are already vulnerable due to their isolation and limited resources. The CHWs' commitment to visiting homes, conducting health assessments, and organizing communal cooking sessions is noteworthy, but these efforts are often hampered by external factors such as inclement weather and financial constraints.

"We support needy families by organizing communal kitchens to provide meals and educate parents on balanced nutrition, but some challenges such as inclement weather and financial limitations, we are encouraged by community participation and the positive impact on children's health." (Rwerere HC, FGD₁)

The finding shows that the domestic conflicts not only strain the relationship between parents but also directly affect the children, who are caught in the crossfire of neglect and inadequate care. These situations make it extremely difficult for CHWs to ensure that children receive the necessary nutrition and care, as they must navigate not only the nutritional education but also the deep-seated social and emotional issues within the family.

"The challenge in the delay of a child from getting well from malnutrition some household have marital conflict and there is a malnourished child, often when the mother would cook for her child the particular food, the man takes it like greed it which becomes an obstacle for the child to get well. Domestic conflicts and alcoholism often affect children's status and it is difficult for us too." (Bungwe HC, FGD₅)

Marital conflicts present a direct barrier to effective nutrition for children, as highlighted by the CHWs. The participant describes a situation where a mother, aware of her child's malnourished state, prepares special food to help the child recover, but due to conflicts with her husband, who perceives this act as selfishness or greed, she is pressured to cook a single meal for the whole family, which dilutes the nutritional value intended for the child. This situation demonstrates how domestic conflicts directly impact a child's access to necessary nutrition, prolonging malnutrition despite the CHWs' interventions.

5. Facilitators to CHWs' Implementation of Nutrition Interventions (core theme 2)

5.1. Subtheme 1: Knowledge and skills on nutrition behaviors

Under this subtheme, the respondents reveal valuable insights into the knowledge and skills of Community Health Workers regarding nutrition behaviors, which play a crucial role in their successful implementation of nutrition interventions for stunting prevention. The narratives provided by the CHWs highlight the proactive and holistic approaches they employ in educating parents and caregivers on proper nutrition, hygiene, and child care practices. These narratives underscore the importance of locally available resources, community engagement, and the integration of health education into everyday practices. Here are the how their expressions:

"These nutrients help the child stay healthy, especially with locally available foods in our village, including vegetables, carrots, sweet potatoes, regular potatoes, and other vegetables. We also advise parents to ensure their children have access to meat or other animal products like eggs and milk, which are essential in fighting malnutrition." (Kinyababa HC, FGD₃).

The CHWs emphasize the importance of utilizing locally available foods to provide a nutritious diet for children. They actively encourage parents to incorporate a variety of vegetables such as carrots, sweet potatoes, and other vegetables that are readily available in the village. Additionally, they stress the importance of including animal products like meat, eggs, and milk in children's diets, recognizing their critical role in preventing malnutrition. This approach not only makes it easier for parents to access necessary nutrients but also fosters sustainable and culturally appropriate dietary practices.

"I tell the mother to prepare a healthy diet for her child that contains energetic, protectors and constructive food, then I teach her how to clean her children and prepare that healthy diet and wash her hands before she feeds or breastfeed the baby." (Kirambo HC, FGD₂)

The CHWs go beyond providing dietary advice by offering hands-on guidance in preparing nutritious meals and maintaining proper hygiene. One participant describes their process of teaching mothers to prepare balanced meals containing energy-giving, protective, and constructive foods. The CHWs also instruct mothers on hygiene practices, such as washing hands before feeding, breastfeeding, and after using the bathroom. This comprehensive approach ensures that children receive not only the right nutrients but also a clean and safe environment, which is essential for their overall well-being.

"Our approach to promoting healthy nutrition involves proactive planning, especially during pregnancy or suspected pregnancy. We encourage expectant mothers to visit health centers for check-ups and dietary advice. We stress the importance of a balanced diet for pregnant women, promoting both small and large meals. We also engage men, encouraging them to support their families' nutrition. After birth, we advocate exclusive breastfeeding for six months before introducing nutritious complementary foods." (Rwerere HC, FGD₁)

The CHWs' approach to promoting healthy nutrition extends to maternal health, particularly during pregnancy. They encourage pregnant women to visit health centers for check-ups and dietary advice, emphasizing the importance of a balanced diet during this critical period. By involving men in the process, CHWs aim to create a supportive family environment that prioritizes nutrition. After childbirth, they advocate for exclusive breastfeeding for the first six months, followed by the introduction of nutritious complementary foods. This integrated approach ensures that children receive proper nutrition from the earliest stages of life.

"Parents may initially refuse vaccinations due to misunderstandings, but comprehensive awareness campaigns often lead to acceptance. However, with effective community mobilization and education, understanding improves (Kinyababa HC, FGD₃)

The CHWs note that through effective community mobilization and education, parents' understanding improves, leading to greater acceptance. This demonstrates the critical role of CHWs in bridging knowledge gaps and fostering positive health behaviors within the community.

"We use MUAC and child's weight and compare it to his age to check if child is malnourished. When we find that a child is malnourished, there are the measurements to test, treat and transfer child, we continue home visit, to observe the hygiene he used in food, in the preparation, in the drinks, paying attention is the way we do it, thank you." (Bungwe HC, FGD₅)

From the discussion participants said that CHWs play a pivotal role in identifying and addressing malnutrition through comprehensive assessment and follow-up. They use measurements such as weight, Mid-Upper Arm Circumference (MUAC), and age to assess a child's nutritional status. When a child is found to be malnourished, CHWs provide immediate advice to the parents on proper nutrition and hygiene practices. They also refer the child to health centers for further assessment and support. The CHWs maintain ongoing follow-up visits to monitor the child's progress, ensuring that proper nutrition and hygiene practices are sustained. This continuous monitoring and support highlight the CHWs' dedication to improving the health and well-being of children in their communities.

5.2. Subtheme 2: CHWs Commitment, Dedication and Monitoring

The findings revealed that the commitment and dedication of Community Health Workers (CHWs) in implementing nutrition interventions for stunting prevention in Burera district are evident through their active involvement in the daily lives of the families they serve. The quotes from the Focus Group Discussions (FGDs) highlight the tireless efforts of CHWs in ensuring that children at risk of malnutrition receive the necessary care and support.

"I reach them in the morning to ensure the child receives breakfast. If there are other obstacles, I plan to visit in the evening to ensure they receive their supper (Rwerere HC, FGD₁).

As illustrated in FGD1 conducted in Rwerere Health Center, a CHW explains their proactive approach by visiting families twice a day—once in the morning to ensure that children receive breakfast and again in the evening to confirm that they have supper. This level of dedication goes beyond a mere job responsibility; it reflects a deep commitment to the well-being of the children in their care. The CHW's actions demonstrate an understanding that consistent nutrition is critical, and they are willing to put in the extra effort to overcome any obstacles that may prevent a child from receiving proper meals.

"We follow up by visiting their household, those who have the malnourished children we take care of them particularly by visiting their home, we walk by foot as community health workers." (Kirambo HC, FGD₂)

Similarly, the participants in Kirambo HC (FGD2) describe a hands-on approach to monitoring and supporting families, particularly those with malnourished children. The CHWs' method of walking to households to follow up on the child's condition underscores their dedication. They take extra care to visit homes regularly, even going as far as to meet with families at the village school nutrition programs (igikoni cy'umudugudu). This continuous engagement ensures that no child is left unattended and that those who are malnourished receive special attention.

"We mainly focus on children under the age of five, but we start with the mother as soon as she conceives in order to monitor the child. Every week we visit the household just checking on any positive improvements. (Butaro HC, FGD₄)

The emphasis on early intervention is also highlighted by Participants, who notes that CHWs begin their monitoring efforts as soon as a mother conceives.

By focusing on both the mother's and child's health, the CHWs work to prevent malnutrition from the earliest stages of life. Their commitment to conducting regular visits to monitor progress, shows a holistic approach to stunting prevention.

"I wake up early in the morning before starting work to visit parents and check on their preparations for the child. I also visit in the evening." (Rwerere HC, FGD₁)

These discussions mentioned how CHWs waking up early to check on the preparations for the child's meals and visiting again in the evening to follow up. This method not only provides immediate support but also allows for the assessment of long-term improvements, ensuring that the interventions are effective.

The above findings explain CHWs as highly committed individuals who go above and beyond to ensure that children in their communities receive the necessary nutrition and care. Their dedication is a crucial facilitator in the successful implementation of nutrition interventions aimed at preventing stunting in Burera district. Their consistent monitoring and hands-on involvement play a vital role in the fight against child malnutrition.

5.3. Subtheme 3: Local Leadership/Government support

The active involvement of local leadership and government support emerges as a crucial facilitator in the effective implementation of nutrition interventions by Community Health Workers (CHWs) in the Burera district. These quotes

from various FGDs highlight the multifaceted ways in which local leaders bolster CHWs' efforts to prevent child stunting. Here are CHWs views:

"We often go to groups or meetings and request the head village for a moment to give a discussion and we teach to all the parents who are there, we do it every month so that they will not forget it. every month and we do it."(Kirambo HC, FGD₂)

In Kirambo, Participants underscores the essential role of local leaders, particularly the head of the village, in facilitating health education activities. CHWs regularly attend community meetings, where they request time to educate parents on proper nutrition practices. This ongoing collaboration with local leaders is instrumental in maintaining the community's focus on nutrition, thereby aiding in the prevention of child stunting.

"We involve local and village leaders to support parental education and early intervention strategies. When faced with challenges, we escalate issues to higher authorities for support."(Kinyababa HC, FGD₃)

Participants emphasize the role of local and village leaders in both supporting parental education and addressing challenges encountered by CHWs. When CHWs face difficulties, such as a lack of participation from parents, they escalate these issues to higher authorities for resolution. This collaborative approach not only resolves immediate challenges but also strengthens the overall implementation of nutrition interventions. Additionally, the establishment of vegetable gardens at homes, promoted by both CHWs and local leaders, enhances access to nutritious foods, making it easier for parents to prepare healthy meals for their children.

"For families in need, we collaborate with village chiefs to refer children to health centers. Once there, children often receive nutritional supplements like fortified flour and milk, which significantly improve their health over time." (Butaro HC, FGD₄)

In FGD₄, Participant 8 highlights how CHWs collaborate with village chiefs to identify and support families in need. When children require additional nutritional support, they are referred to health centers with the help of local leaders. At these centers, children often receive fortified supplements, such as flour and milk, which significantly improve their nutritional status over time.

"When mothers reject our intervention, we report to the village leader, and he goes to each one of residents asked her why she does not participate in these activities. he wakes her up he comes, and we see her otherwise things go well."(Bungwe HC, FGD₅)

The participants illustrate the role of local authorities in enforcing community participation in nutrition-related activities. They describe how, when a mother does not attend CHW sessions or follow prescribed nutritional practices, the issue is reported to the village leader. The leader then intervenes directly, ensuring that the mother engages in these essential activities. This level of involvement by local authorities reinforces the importance of the CHWs' work and ensures that all community members are actively participating in the fight against child stunting.

The discussion highlight that the support of local leadership and government authorities is indispensable to the success of CHWs' nutrition interventions. Whether through facilitating education sessions, resolving challenges, ensuring access to nutritional supplements, or enforcing participation, local leaders play a critical role in the ongoing efforts to prevent child stunting in the Burera district. Their involvement not only enhances the effectiveness of CHWs but also strengthens the overall community's commitment to improving child health outcomes.

5.4. Subtheme 4: Training and Capacity Building

The FGDs conducted across various health centers highlight the significant role that training and capacity-building initiatives have played in enhancing the effectiveness of Community Health Workers in implementing nutrition interventions for stunting prevention. The recurring theme of training as a facilitator in these discussions underscores the importance of continuous education and skills development for CHWs.

"Yes, we receive regular training sessions, I know how to measure a child and see his progress like this brain stimulation thing that comes from the recent training. Thank you!" (Rwerere HC, FGD₁)

Participants pointed out how trainings have equipped them with vital skills, such as accurately measuring a child's height and understanding the appropriate posture for measurements based on age. The reference to "brain stimulation" reflects the CHW's growing awareness of holistic child development, a concept introduced in their recent training. This

enhanced knowledge allows CHWs to better monitor and promote the overall growth and development of children in their care.

"The training always comes with new things, now we know that if you give him one of these foods it is incomplete, if he takes beans, he should get animal products, if he is given vegetables, he should get fruits, then if he gets potatoes, he should get porridge, we have seen to prepare food for a child it consists of at least five types, without replacing it with anything else." (Kirambo HC, FGD₂)

At Kirambo, CHWs highlighted and discussed the importance of providing a balanced diet that includes all essential food groups, stressing that no single type of food can meet all nutritional needs. This shift in understanding—from merely providing food to ensuring a complete and balanced diet—demonstrates the impact of training in deepening CHWs' knowledge of nutrition. The ability to link different food types to their specific benefits shows an advanced comprehension of nutritional principles, which is critical in stunting prevention efforts.

"Yes, we receive training on good nutrition. Initially, we received numerous trainings when we started this job, which greatly enhanced our ability to identify and support children with poor nutrition and stunting issues during our monthly visits to the village kitchen. The recent trainings took place at the health center earlier this year, around 2024, it was a lengthy training session that spanned several days. It's crucial for a child's development starting from conception up to two years, when their brain is still developing. We provide these trainings to parents as well." (Kinyababa HC, FGD₃)

CHWs in Kinyababa expressed appreciation for the extensive training they have received, particularly on the importance of good nutrition from conception to early childhood. This knowledge not only improves their capacity to support child development but also enables them to educate parents effectively. The mention of a lengthy training session earlier in 2024, which covered nutrition and care practices in detail, suggests that these comprehensive trainings are instrumental in enhancing CHWs' ability to identify and address nutritional deficiencies in their communities.

"Yes, we have received training. We learned that preventing poor nutrition begins during pregnancy, with the mother consuming a balanced diet, and avoiding alcohol and heavy work." (Butaro HC, FGD₄)

The training has also extended to educating CHWs on prenatal nutrition and its significance in preventing child stunting. The discussions emphasize the importance of a balanced diet during pregnancy and the avoidance of harmful practices such as alcohol consumption and strenuous activities. By incorporating this knowledge into their community outreach, CHWs can influence maternal behavior, contributing to better health outcomes for children even before they are born.

"We receive frequent training sessions, especially since the introduction of "Gikuriro kuri Bose" in our district. These sessions enhance our knowledge of nutrition. We also visit parents at home, teaching them how to prepare balanced meals that include proteins, carbohydrates, vitamins, seafood like "indagara," and animal products such as eggs and meat." (Bungwe HC, FGD₅)

The training provided through the "Gikuriro kuri Bose" initiative in Bungwe district has further strengthened the CHWs' expertise in nutrition. Participants noted that these frequent training sessions not only enhance their understanding but also improve their ability to educate parents on preparing balanced meals.

The specific mention of including seafood like "indagara" and animal products in meals indicates that CHWs are now better equipped to recommend diverse and nutritious diets, crucial for preventing stunting.

Overall, the findings demonstrate how regular and targeted training has empowered CHWs with the knowledge and skills needed to effectively implement nutrition interventions. This capacity-building is a critical facilitator in the fight against child stunting, enabling CHWs to make informed decisions and provide valuable guidance to the communities they serve.

5.5. Subtheme 5: Community Engagement and Trust

The findings from the Focus Group Discussions (FGDs) highlight the importance of community engagement and trust as crucial facilitators in the Community Health Workers' (CHWs) implementation of nutrition interventions for stunting prevention in Burera district, Rwanda. These narratives provide insight into how CHWs build relationships with the community, educate them on proper nutrition, and the mutual benefits that arise from this interaction.

"In terms of protecting children from malnutrition, we work together with mothers to understand the process of preventing stunting. Through close proximity and continuous support, we have built trust with families. When children fall ill, families often reach out to us for advice. We receive tremendous support from the community, evident in their active participation during children's health assessments and cooking sessions."(Rwerere HC, FGD₁).

The CHWs witnessed how the community's involvement contributes to the improvement of children's health, which, in turn, motivates them to continue their work. Trust between CHWs and the community is a recurring theme across the FGDs. The proximity of CHWs to the community allows them to build strong, trusting relationships with families.

"Also, regarding proper nutrition in the villages, we have a weekly meeting where we are often given a speech, the community health worker and he teaches the people. Then we explain to them what give energy and their types so that everyone understands what they have and uses it better, everything must be done with hygiene so that the children have a healthy life." (Kirambo HC, FGD₂)

From their insights, the engagement extends to weekly community meetings where CHWs educate parents, especially those with children under five years old, on proper nutrition and hygiene. These meetings are not just about imparting knowledge but also about creating an environment where community members can ask questions, share experiences, and learn from one another.

"Parental trust and advocate for our services, promoting community trust and engagement. When community members entrust us with their children's well-being, it validates our work and strengthens our resolve. Seeing their eagerness to implement our recommendations inspires us to persevere, and when community members actively participate in our programs and advocate for our role, it affirms the value of our efforts."(Kinyababa HC, FGD₃)

The active participation of the community, as seen in events like village kitchens, serves as a morale booster for CHWs. It reflects the community's commitment to implementing the recommendations provided by the CHWs, thereby improving the overall health outcomes in the area. The trust that parents place in CHWs motivates them significantly. When parents see improvements in their children's health after following the CHWs' advice, it validates the CHWs' efforts and encourages them to continue their work with even greater dedication. Positive feedback from satisfied parents also plays a crucial role in enhancing the CHWs' motivation and commitment. This feedback helps to build a cycle of trust and engagement, where the success of the interventions leads to increased community trust, which in turn motivates the CHWs to persist in their efforts.

"The community's attendance at village kitchens and their implementation of our nutrition advice motivate us. The community's trust in us is evident when they seek information from us regarding health programs. This trust reinforces our dedication to our work."(Butaro HC, FGD₄)

Furthermore, participants described that the support from local leaders and the community's willingness to adopt balanced diets and health recommendations are additional factors that reinforce the CHWs' dedication. When community members actively seek information from CHWs regarding health programs, it reflects the deep trust they have in the CHWs, which is a critical factor in the success of the nutrition interventions.

The findings from the FGDs underscore the symbiotic relationship between community engagement and trust in facilitating the CHWs' implementation of nutrition interventions. The active involvement of the community, combined with the trust they place in CHWs, creates a supportive environment that enhances the effectiveness of the intervention.

5.6. Subtheme 6: Communications and Supervision

As discussed in various FGDs, the availability of communication channels and supervision plays a crucial role in facilitating Community Health Workers (CHWs) in implementing nutrition interventions for stunting prevention in Rwanda, as reflected in the FGDs. These quotes highlight the structured approach and dedication of CHWs in ensuring that nutritional information is accurately gathered, reported, and acted upon, despite the challenges they face.

"Every month we record the child's data and every month then we have a date to go to organize the report and we meet in the village four community health workers with cell supervisor. After the representatives of the village meet at the health center and coordinate the information, then leave it with the community health officer (CHO) at the health center. Additional good thing is that we have a free call between us"(Kirambo HC, FGD₂)

The findings shows that the CHWs describe a well-organized system for tracking and reporting children's nutritional status. The process is highly collaborative, with CHWs meeting at various levels—from the village to the health center—to coordinate and consolidate data. This system of communication and supervision ensures that no child is left behind, even if they miss scheduled assessments at the village level.

"We monitor meal preparations daily, guiding to ensure children receive adequate nutrition despite economic limitations. We document our findings on paper after assessments and send reports to the health center."(Kinyababa HC, FGD₃)

The participants from Kinyababa HC emphasizes the importance of daily communication and monitoring in the context of meal preparations. By documenting their findings and sending reports to the health center, CHWs help maintain continuity of care and contribute to informed decision-making at higher levels. This continuous communication loop between CHWs and the health center is essential for addressing ongoing challenges in child nutrition.

"There isn't a fixed schedule, but we attend monthly meetings at the health center where the Community Health Officer reinforces strategies to combat poor nutrition in the community, but every day we can make a call for free each other to give updates."(Butaro HC, FGD₄)

The CHWs highlighted the role of supervision in reinforcing nutrition strategies. Although there isn't a fixed schedule, the monthly meetings at the health center serve as an important touchpoint for CHWs. This regular supervision ensures that CHWs remain aligned with broader public health goals and are supported in their efforts to combat poor nutrition.

The FGDs findings illustrate the critical role that effective communication and supervision play in enabling CHWs to implement nutrition interventions successfully. The structured reporting systems, regular meetings, and continuous guidance provided by the supervision team are key factors in the ongoing efforts to prevent stunting and improve child nutrition in Rwanda.

6. Mothers Perceptions on CHWs nutrition intervention (core theme 3)

6.1. Subtheme 1: Trust and Satisfaction with CHWs

The perceptions of mothers on the Community Health Workers' nutrition interventions for stunting prevention are overwhelmingly positive, as reflected in the Key Informant Interviews conducted across various health centers. Under the subtheme of their trust and satisfactions on the CHWs intervention, we highlighted their insights as follow:

"The community health workers visited me since I was pregnant even when I gave birth the community health worker visits, educate me how to take nutritious food and other nutritional practice including hygiene. I really trust and we understand the teachings and services they give us as they improved our children's health especially nutrition status." (Kirambo HC, KII₁)

Mothers express a high level of trust in the CHWs, recognizing the impact of their teachings and services on the health and nutrition of their children. This trust is built on the consistent and effective interactions mothers have with CHWs, particularly during critical periods such as pregnancy and early childhood. The same respondent from Kirambo (KII₁) mentions, "The community health workers visited, educates me on how to take nutritious food, and other nutritional practices including hygiene me since I was pregnant even when I gave birth."

"We can say that the teachings we get from CHWs are satisfying and understandable. They train us every month when we go in village nutrition school, they show us how to prepare a proper nutrition for our children. We do that every month and we are satisfied with their services."(Butaro HC, KII₂)

The findings shows that the satisfaction with the CHWs' Implementation of Nutrition Interventions is also prominently featured in the mothers' narratives. The key informant in Butaro expressed the satisfaction derived from the CHWs' training sessions, which are practical and hands-on.

She notes, "We can say that the teachings we get from CHWs are satisfying and understandable. They train us every month when we go to village nutrition school, there is somewhere in the village where we meet and cook for children, they show us how to prepare proper nutrition for our children. We do that every month and we are satisfied with their services." This statement underscores the effectiveness of the CHWs' approach, which not only educates but also actively involves the mothers in applying what they learn.

"Yes, I do you know about proper nutrition to feed in order to prevent stunting in children, and I was taught this by community health workers. CHWs are the ones who gives teaching and discussions about proper nutrition for children in my village. We appreciate, satisfied and trust the nutrition support they give us."(Kinyababa HC, KII₃)

"Regarding the activities of community health workers in my society about nutrition and stunting, I am satisfied with them and these activities are well-performed by CHWs in village."(Bungwe HC, KII₄)

Caregiver from Kinyababa Health Center (KII₃) shares her experience, stating, "CHWs are the ones who give teaching and discussions about proper nutrition for children in my village. We appreciate, are satisfied, and trust the nutrition support they give us." This appreciation is not isolated, as a respondent from Bungwe Health Center (KII₄) echoes similar sentiments, emphasizing that she is satisfied with the CHWs' activities in her village and recognizes their well-executed efforts in preventing stunting through nutrition interventions.

The findings reveal that mothers not only trust the CHWs but are also highly satisfied with the nutrition interventions they implement. This satisfaction stems from the CHWs' consistent, practical, and supportive approach to educating mothers on proper nutrition, which has directly contributed to improving the health and nutritional status of their children.

6.2. Subtheme 2: Increased knowledge and awareness

The perceptions of mothers regarding Community Health Workers (CHWs) and their role in nutrition interventions for stunting prevention reveal a deep appreciation for the knowledge and awareness these workers bring to the community. Through various key informant interviews (KIIs) conducted in different health centers, mothers have expressed how the CHWs have become pivotal in their understanding and practice of proper nutrition, ultimately contributing to the prevention of child stunting.

"Are the community health workers who teach us about proper nutrition when we are in the village nutrition school, related to reducing malnutrition or preventing stunting in children and they really improved our understanding."(Kirambo HC, KII₁)

Caregivers emphasized the direct link between the teachings of CHWs and the reduction of malnutrition and stunting in children. She acknowledged that the knowledge imparted by CHWs in village nutrition schools significantly enhanced her understanding of proper nutrition, which is critical in preventing stunting. This sentiment underscores the effectiveness of CHWs in educating mothers about the importance of nutrition and its role in child development.

"Are the community health worker in the area where we live, who advocate or who teaches us about proper nutrition for children and are the ones who warn about stunting prevention and have the attention of the people in our village as our close trustful health services provider."(Butaro HC, KII₂)

Key informant highlighted the trust and attention CHWs have garnered within the community. She pointed out that CHWs are not just educators but also advocates who emphasize the importance of proper nutrition for children and the prevention of stunting. Their role as trustworthy health service providers in the village has made them central figures in promoting health and preventing malnutrition, illustrating the community's reliance on CHWs for essential health information.

"During our monthly gathering, CHWs teach us how to take care of a child while still in the womb. They teach that you don't have to starve; you must try to eat well to nourish the baby in the womb till the baby reaches at 2 years, and they support to own home green garden regardless the family financial status."(Bungwe HC, KII₄)

Some mothers shared the experience of attending monthly gatherings where CHWs and nurses provide critical education on maternal and child nutrition. She recounted how they emphasize the importance of maternal nutrition from pregnancy through the child's first two years of life. The CHWs also support families in establishing home green gardens, making it easier for even financially struggling families to provide nutritious meals. This initiative not only educates but also offers practical solutions to overcome barriers to proper nutrition.

"Yes, as usual, I know the nutritional requirements my children need to prevent malnutrition, in order to maintains a healthy body weight of my child. We were trained by community health workers in the village kitchen, and we really find their advice useful to improve our children health."(Rwerere HC, KII₅)

Mothers expressed her confidence in the nutritional education provided by CHWs. She explained that the training received in the village kitchen equipped her with the necessary knowledge to meet her children's nutritional needs and maintain their healthy body weight. The advice from CHWs on feeding practices, including the introduction of vegetables and mixed foods, has been instrumental in improving the health of children in her community.

The findings from these key informant interviews on this subtheme, highlight the crucial role that CHWs play in enhancing mothers' knowledge and awareness of proper nutrition. Their interventions are not only appreciated but are also seen as effective in preventing stunting and promoting overall child health in the communities they serve. The consistent emphasis on education, trust-building, and practical support reflects the profound impact of CHWs on maternal and child health outcomes in these Rwandan communities.

6.3. Subtheme 3: Economic Hardships and Family issues

The results from Key Informant Interviews reveal that while Community Health Workers are actively engaged in promoting nutrition interventions to prevent stunting, economic hardships and family issues significantly and negatively impact both the effectiveness of these interventions and the perceptions of the mothers they serve.

"The CHWs in my area do home visits often, but their family responsibilities some time affect a home visit schedule unless they see that your kid has a problem that is when they do home visit without missing any day."(Butaro HC, KII₂)

One key informant from Butaro highlighted the challenge faced by CHWs due to their dual roles as both community volunteers and family members. The CHWs often conduct home visits to monitor the nutritional status of children, but their responsibilities at home can sometimes interfere with their work. Since CHWs are volunteers and do not receive a salary, they might prioritize their family needs over scheduled visits unless they perceive an immediate risk to a child's health. This inconsistency in visits can affect the level of support and monitoring that families receive, potentially undermining the effectiveness of the nutrition interventions.

"The activities CHWs do in our area related to preventing stunting include encourage us to have small domestic animals like chicken, but not everyone of us capable of having all of them due to lack of money but we understand that are important."(Kinyababa HC, KII₃)

The economic situation of the families is a significant barrier to the successful implementation of CHWs' recommendations. This mother pointed out that while CHWs encourage families to maintain kitchen gardens and rear small domestic animals like chickens to improve nutrition, not all families can afford these practices. The lack of financial resources makes it difficult for many families to implement these interventions fully, despite understanding their importance.

"Yes, knowing about nutritious food doesn't mean you can afford it. Imagine working for 1200frw and coming home to find no soap or salt. Buying nutritious food for the baby seems expensive, so you opt for cheaper, less nutritious options to feed all the children at home."(Bungwe HC, KII₄)

The KII₄ discussed the stark reality of trying to feed a family on a limited income. She expressed frustration that, even though she knows what constitutes a nutritious diet to prevent stunting, her financial situation often dictates otherwise. With a daily income of just 1,200 Rwandan francs (approximately 1 USD), it becomes impossible to prioritize purchasing nutritious foods like eggs and vegetables when basic necessities such as staple foods, soap, and salt are also needed. The struggle to balance limited resources forces families to opt for cheaper, less nutritious food options, which could compromise the health and development of their children.

These findings underscore the fact that economic hardships and family obligations are significant obstacles to the effective implementation of nutrition interventions for stunting prevention. While the knowledge and commitment of CHWs are crucial, the broader socio-economic context within which these families live plays a decisive role in the success or failure of these health interventions.

6.4. Subtheme 4: Nutrition Campaign and Mobilization

Mothers expressed a strong awareness of proper nutrition, attributing their knowledge to the efforts of CHWs through nutrition campaigns and mobilization activities. These campaigns play a crucial role in the CHWs' implementation of nutrition interventions aimed at preventing stunting among children.

"I am proud to say that I know about proper nutrition when we go to village school nutrition (igikoni cy'umudugudu) where the CHWs teach us. that is where we learnt about preparing healthy food even how to prepare that proper nutrition." (Butaro HC, KII₂)

One mother from Butaro expressed pride in her knowledge of proper nutrition, which she gained through the village nutrition school, known locally as "igikoni cy'umudugudu." She highlighted the significance of the CHWs' teachings at these schools, noting that this is where she learned not only about preparing healthy food but also about the specific steps involved in ensuring proper nutrition for her family. This reflects the effectiveness of the CHWs' efforts in educating the community on essential nutrition practices.

"CHWs, they don't normally visit all household except under five children especially stunted ones, but in general once in a month all mothers we meet in the village nutrition school for education and stunting prevention teachings." (Kinyababa HC, KII₃)

Another mother mentioned that while CHWs do not visit all households regularly, they make a point of focusing on households with children under five years old, particularly those with stunted children. Despite the limited household visits, she emphasized that all mothers in the community gather once a month at the village nutrition school. During these gatherings, CHWs provide education on stunting prevention and proper nutrition, ensuring that all mothers receive the necessary guidance and support to improve their children's nutritional status.

"CHWs mobilize the nutrition services through different campaign and community meetings. Additionally, they practically contribute by preparing children's meals in the village kitchen, ensuring our children receive the nutritious breakfast and lunch." (Rwerere HC, KII₅)

The importance of CHWs in mobilizing nutrition services was further emphasized by a mother from Rwerere. She noted that CHWs actively engage in nutrition campaigns and community meetings to raise awareness and promote healthy eating practices. This practical involvement ensures that children receive nutritious meals, such as breakfast and lunch, directly contributing to the prevention of stunting in the community.

The findings on the above subtheme underscore the vital role of CHWs in nutrition campaigns and mobilization efforts within their communities. Through education, community meetings, and direct involvement in meal preparation, CHWs empower mothers with the knowledge and resources needed to prevent stunting and promote healthy growth in their children.

6.5. Subtheme 5: Engagement and Support of Community Leaders and Peer

The results from mothers on Engagement and Support of Community Leaders and Peer highlight the critical role of community leaders, particularly village heads, and the collective efforts of community members in supporting CHWs in the implementation of nutrition interventions for stunting prevention.

"The village head mobilize us to attend stunting prevention programs in our village and encourage us to pay attention on the CHWs advises, and our community trust the CHWs and understand/respect what the CHW teaches." (Butaro HC, KII₂)

Some mothers emphasized the influential role of the village head in mobilizing community members to participate in stunting prevention programs. The village head is portrayed as a key figure who not only informs the community about such initiatives but also encourages them to heed the advice of CHWs. The trust placed in CHWs by the community is evident, as the mother highlighted that the community respects and understands the teachings of CHWs. This trust is critical, as it underscores the community's belief in the CHWs' capability and provide appropriate guidance, which in turn enhances the effectiveness of the interventions.

"It's not necessary for a parent to go to the health center, but if they find that the baby's weight is less than expected, they advise you to go, if you refuse, they call village leader to force you to go at health center and to attend village nutrition school. I personally appreciate their work. They perform it well." (Bungwe HC, KII₄)

The KIIs findings also reveal participants recounted how CHWs diligently monitor newborns by measuring their weight and offering advice based on the child's progress. The respondent appreciated this service, noting that CHWs ensure that children who need further attention are referred to health centers. Importantly, if a parent is reluctant to follow the CHWs' advice, the CHWs involve the village leader, who plays an enforcement role, ensuring that the parent complies

by visiting the health center or attending the village nutrition school. This collaboration between CHWs and village leaders ensures that no child is left behind and that interventions are taken seriously by the community.

“Even when supplies like beans and others run low in our kitchen, CHW together with community members and village leaders ensure that they are replenished to keep kitchen operations running smoothly. For instance, we all contribute two kilograms of maize and beans as requested without any issues” (Rwerere HC, KII5)

The smooth functioning of the community kitchen is attributed to the collective efforts of CHWs, community members, and village leaders. When supplies run low, CHWs, together with the community and village leaders, work to replenish them, ensuring that the kitchen continues to provide necessary support.

The community's willingness to contribute resources, such as maize and beans, without hesitation, demonstrates a shared commitment to the success of these interventions. The insights gathered from the KIIs underscore the importance of community engagement, leadership, and peer support in the successful implementation of CHWs' nutrition interventions for stunting prevention. The collaboration between CHWs, village leaders, and the community ensures that interventions are well-received, resources are mobilized effectively, and accountability is maintained, ultimately contributing to the overall health and well-being of children in these communities.

7. Discussion

7.1. Barriers that CHWs face when implementing nutrition interventions for child stunting prevention in Burera district, Rwanda

This study results identified barriers such as Lack of proper tools (smartphones, specialized equipment); Lack of knowledge about digital tools for better reporting and monitoring; Insufficient equipment and resources which are similar with the study conducted by Gadsden et al., 2021 on limited technology skills and access to digital tools as major barriers. CHWs lack smartphones, laptops, and other equipment necessary for efficient data recording and reporting. This deficiency results in delays and incomplete data submission, affecting the timeliness and effectiveness of nutrition interventions. Training and provision of digital tools are needed to address this issue. CHWs face significant geographical and transport challenges, especially in remote and rural areas. Difficult terrain and reliance on walking long distances for travel impede their efficiency and ability to manage personal responsibilities.

Refers to the study done by Hotz C et al, this study findings about improving transportation and logistical support could enhance their ability to deliver timely care as well as cultural and religious beliefs sometimes conflict with nutrition interventions which making it difficult to fully implement recommendations are closely similar. Persistent traditional practices and religious constraints impact the acceptance of certain nutritional advice. Ongoing education and engagement with cultural and religious leaders are essential to reconcile these beliefs with modern health practices. (Hotz C et al., 2016). The lack of technology knowledge, skills, and professional expertise among CHW-led intervention programs has been identified as a barrier. (Gadsden et al., 2021)

The barriers such financial difficulties among families and resource limitations for CHWs are significant affecting the nutritional interventions for child stunting the same as highlighted by Long et al., in 2018. They highlighted a scarcity of resources and limited access to healthcare and economic support in impoverished regions as primary barriers". Poverty affects families' ability to afford nutritious foods, and financial aid intended for child nutrition may be misused. Addressing financial constraints and improving resource management are crucial for enhancing the effectiveness of interventions. Family conflicts, including separations and poverty, impact children's nutritional needs and create logistical difficulties for CHWs. Additional support mechanisms for families and better access to resources are needed. (Long et al., 2018)

7.2. Facilitators to CHWs' nutrition interventions in addressing child stunting in Burera district

This study is closed justified the Government of Rwanda and partners to initiate an extensive and diverse plan to effectively combat child stunting within the next two years plan through increase CHWs' extensive knowledge and practical skills to effective nutrition intervention. Their use of locally available resources and integration of maternal health education into their interventions enhance the relevance and feasibility of their recommendations. CHWs demonstrate strong commitment and dedication, including frequent home visits and thorough monitoring. Their proactive approach ensures continuous support and adaptation of interventions to meet individual needs. Support from local government facilitates effective nutrition interventions. (WHO, 2014)

This study results are similar with the Government of Rwanda report of 2023 about the collaboration with village heads and local authorities strengthens community engagement and resource access, reinforcing the implementation of health programs. Ongoing training and capacity building enhance CHWs' ability to deliver effective nutrition interventions. Continuous education updates their skills and knowledge, ensuring accurate assessments and recommendations. Strong community engagement and trust in CHWs are vital for successful nutrition interventions. Positive relationships and active participation in health activities contribute to the effectiveness of interventions. Effective communication and supervision are crucial. Structured reporting systems and regular meetings ensure accurate data collection and timely responses to challenges, maintaining the quality of interventions. (GoR,2023)

7.3. The perspectives of caregivers on the implementation of CHWs nutrition interventions for reducing child stunting in Burera

The findings from this study KIs are closely similar with the study done by Bridge R, Lin TK., 2024 about the impact of community health workers in the prevention, identification, and management of undernutrition amongst children under the age of five. Mothers generally trust and are satisfied with CHWs' services. The regular, practical support and education provided by CHWs, including cooking demonstrations and nutritional guidance, have positively impacted mothers' understanding and children's health. CHWs' interventions have increased mothers' knowledge of nutrition and its role in preventing stunting. (Bridge R, Lin TK., 2024).

The barriers come subthemes identified in this study are complementing with others of Gadsden et al., 2021 which highlight that the economic constraints often limit the implementation of this knowledge, highlighting the need for additional support. Economic hardships and family issues challenge the effectiveness of nutrition interventions. Financial constraints hinder the ability to follow nutritional advice, indicating a need for broader support mechanisms. CHWs play a crucial role in organizing and leading nutrition campaigns and educational activities. Support from community leaders and peers is essential for the success of nutrition interventions. Their involvement helps mobilize community participation and adherence to health recommendations, reinforcing the effectiveness of CHWs' efforts. The study has demonstrated several negative and positive factors affecting CHWs nutrition intervention on stunting prevention, including technological, logistical, and financial challenges, their knowledge, dedication, and support from local leadership are significant facilitators. Mothers' perceptions highlight trust and satisfaction with CHWs' interventions, although economic constraints and family issues remain obstacles. Addressing these barriers while leveraging facilitators will enhance the effectiveness of nutrition programs aimed at preventing child stunting. (Gadsden et al., 2021)

According to Condo et al., 2014 study, discovered that CHWs were active members of the community and held high regard by those they served. Their motivation was greatly influenced by community Performance-Based Financing (cPBF) of Rwanda's health system, as well as the community's respect for them, this study findings identified the CHWs commitment and dedication to serve community despising the challenges they face during their service. (Condo et al., 2014). As the study of Ahmed et al., 2022 emphasize on this point the same as our study, the trust established between patients, communities, and CHWs was identified as a crucial element. CHWs continue to address cultural and religious barriers through education and advocacy. Referring this study to the Rezvan, P.H. et al study, the emphasis on educating families about nutrition and monitoring children's growth has led to increased parental commitment and awareness. This approach has been effective in gradually shifting behavior and improving nutritional outcomes, although it requires persistent effort. Despite these challenges, CHWs remain resilient and committed to their work. (Rezvan, P.H. *et al* 2020)

This study findings are similar to others about advocate for greater government support to help them address these domestic challenges more effectively, through increased resources, better access to remote areas, or more robust community support systems, it is clear that CHWs require additional assistance to overcome the barriers posed by family conflicts and ensure that all children have the opportunity to thrive. (Long et al., 2018)

8. Conclusion

This study aimed to explore the barriers, facilitators, and caregivers' perspectives regarding Community Health Workers' nutrition interventions for preventing child stunting in Burera District, Rwanda. The findings data highlights the multifaceted challenges faced by CHWs and the supportive elements that enable their work, as well as the perceptions of caregivers who interact with these health workers. The first objective aimed to explore the barriers that CHWs face when implementing nutrition interventions to prevent child stunting. The study found that majority of CHWs reported technological challenges, including limited access to digital mobile devices and difficulty using digital tools for data collection and reporting. Additionally, most of CHWs cited geographical and transportation challenges, with many working in remote areas that are difficult to access, particularly during the rainy season. Cultural and religious beliefs

were also identified as barriers by high number of CHWs, who mentioned resistance from some community members to certain nutrition practices. Financial constraints identified as a significant barrier for many of CHWs, with many struggling to cover transportation costs and other expenses associated with their work. Also, the majority of CHWs highlighted domestic responsibilities as a major challenge, noting that balancing work and home life often hampers their ability to fully commit to their roles. Despite these barriers, CHWs have shown resilience, driven by their commitment to improving child health in their communities.

The second objective focused on identifying facilitators that enhance the effectiveness of CHWs' nutrition interventions. The study found that majority of CHWs highlighted that their knowledge and skills in nutrition, acquired through continuous training, were crucial in overcoming some of the barriers they face. The dedication and commitment of CHWs, cited by most of them, was also identified as a significant facilitator, with many going above and beyond their official duties to ensure successful intervention outcomes. Strong community relationships were reported by many of CHWs, who noted that trust and mutual respect between them and the community members they serve greatly improve the effectiveness of their interventions. Support from local leadership and government was also crucial, with most CHWs highlighting the importance of regular supervision, monitoring, and feedback systems in enhancing their work. These facilitators play a crucial role in overcoming the challenges faced by CHWs, enabling them to deliver effective nutrition interventions. The study also explored the perspectives of caregivers, particularly mothers, on the effectiveness of CHWs' interventions. The third objective sought to understand caregivers' perspectives on the implementation of CHWs' nutrition interventions. The findings revealed that majority of caregivers trust and are satisfied with the work of CHWs, acknowledging the positive impact of these interventions on their children's health and nutrition. However, economic hardships were cited by many of caregivers as a barrier to fully implementing the recommended practices, with many struggling to afford nutritious food and other necessities. Family responsibilities also identified as the main challenges, where some caregivers reported that their responsibilities as well as CHWs families' often limit their ability to participate in nutrition programs. The study emphasized the importance of community leaders and peer support in enhancing caregivers' engagement and cooperation with CHWs.

This study provides a clear understanding of the barriers, facilitators, and caregivers' perspectives on CHWs' nutrition interventions for stunting prevention in Burera District, Rwanda. The findings highlight that CHWs in Burera District face significant barriers in implementing nutrition interventions such as screening, treating, monitoring, counselling and referring. Among the barriers which affect their performance including technological, geographical, cultural, financial, and domestic challenges. These barriers hinder their ability to effectively prevent child stunting, despite their dedication and the supportive environment provided by local leadership and government initiatives several. The study identified that despite the challenges faced, several facilitators enable CHWs to succeed in their roles. The most significant of these are their knowledge and skills in nutrition, strong community relationships, and support from local leadership and government. Continuous training and robust supervision systems also play a critical role in enhancing the effectiveness of their interventions. Also, the study found that Caregivers generally view CHWs positively and acknowledge the benefits of their interventions on child health and nutrition. However, economic hardships and family obligations remain significant obstacles to fully implementing CHWs' recommendations, highlighting the need for additional support and resources to ensure the sustainability of these interventions. The role of community leaders and peer support emerged as significant in reinforcing the efforts of CHWs.

Compliance with ethical standards

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Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of ethical approval

This study was conducted in accordance with ethical guidelines and regulations. Ethical approval with ref. number: MKU/ETHICS/23/01/2024(01) was obtained from MKU Institutional Ethics Review Committee (IERC) and all necessary permissions with Ref:M/2728/07/04//00 from Burera district secured before data collection. Informed consent was obtained from all participants involved in the study, ensuring confidentiality and voluntary participation.

Statement of informed consent

This study adhered to ethical guidelines, with informed consent obtained from all participants. They were informed of the study's purpose, procedures, risks, and benefits, with the right to withdraw at any time. Confidentiality was maintained, and ethical approval was secured from the relevant review board.

Declaration of any conflict of interest related to the work

The authors declare no conflicts of interest related to this study

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