

ORIGINAL ARTICLE

Infant and Young Child Feeding Practices and Nutritional Status of Children Aged 6-59 Months Seeking Medical Care at Kyegegwa Hospital, Kyegegwa District, Uganda

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ABSTRACT

Malnutrition refers to improper intake of energy and nutrients. In Uganda, the prevalence of stunting, underweight and wasting stands at 29%, 11% and 4% respectively. This study was carried out to document the feeding practices and establish the relationship between the nutrition status of children 6-59 months old seeking health care at Kyegegwa Hospital, hence facilitating the understanding of the complicated links between nutrition and disease.

A quantitative and qualitative cross-sectional study was carried out using simple random sampling to select 150 children aged 6-59 months. A semi structured questionnaire, observation check list, Focused Group Discussion guide and anthropometrical measurements were used. Qualitative and quantitative data was analysed using Nvivo and STATA respectively following export from Excel. Bivariate and multivariable logistic regression analysis was used to identify the factors associated with nutritional status. A p-value < 0.05 was considered significant with 95% confidence interval.

Prevalence of underweight, stunting, and wasting in this study were 4.67%, 10%, and 0.67% respectively. The average meal frequency (63.2%) was three times in the past 24 hours with the highest (52%) number of children being fed using cups. Less than 50% ate Vitamin A rich fruit, meal frequency was significantly associated with stunting and reliability of water supply was associated with wasting. Prevalence of stunting (10%) and underweight (4.67%) was high but lower than the national level. Meal frequency and reliability of water supply were significantly associated with the nutritional status of children aged 6-59 month.

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1. Introduction

Malnutrition, in all its forms, refers to both under nutrition (including stunting, wasting, underweight and micronutrient deficiencies) and overweight, obesity and other diet-related Non-Communicable Diseases (NCDs) (Micha & Mannar, 2017). Globally, every country is affected by malnutrition, which causes 22.2% of all children between 0 and 59 months to be stunted, 7.5% to be wasted, and 5.6% to be overweight (Fanzo et al., 2019). In the last five years, one-third of the world's undernourished children came from Sub-Saharan Africa; compared to other nutritional situations, under nutrition has been the leading cause of prevalence and mortality rates. There is a simultaneous rise in both overweight and obesity situations in low- and middle-income countries of the world, with over 41 million children affected (Hawkes & Fanzo, 2017). Over one-third of children under the age of five in Uganda are stunted and 32% of children aged 6 to 59 months suffer from chronic malnutrition (Moummou et al., 2022). Micronutrient deficiencies, primarily involving iron and vitamin A, rank second most frequently (Adebisi et al., 2019). According to Uganda's government figures, 1.3% of children have severe acute malnutrition and 3.6% of children have moderate acute malnutrition, with prevalence varying across the nation (Okethwangu et al., 2019). However, due to the difficulty of routine assessment in young children, all forms of malnutrition continue to be mainly concealed in Uganda. Acute malnutrition (wasting) affects 4% of children in Uganda aged 6 to 59 months (Adebisi et al., 2019). According to a UNHCR study conducted in 2017, Kyegegwa has a prevalence of 8.5% for global acute malnutrition (GAM) and a stunting rate of 36.5%, both of which are categorized as "poor" and "critical" by WHO cut off standards (UNHCR, 2017). Underweight was 15.5%, and continued breastfeeding after one year was at 94.1%. Consumption of iron-rich foods was at 63.2%, reduction of meal sizes in homesteads was at 28.2% and 33.5% of households practiced coping strategies (UNHCR, 2017). The best feeding practices include starting breastfeeding as soon as possible after birth, doing so exclusively for the first six months, then continuing to do so for up to two years and beyond while supplementing with the right foods beyond the first six months (Tiwari et al., 2016). However, in Kyegegwa, infant formula feeding, coping mechanisms like borrowing food and reducing food quantities, as well as stress coping mechanisms, keep timely initiation of breastfeeding at 80.0% and exclusive breast feeding for less than 6 months at 81.8%, both of which are still below the universal coverage recommended by WHO and UNICEF. Historically, it has been quite difficult to get sufficient data on dietary habits and food consumption (Micha et al., 2018).

Standard deviations or Z scores are taken into account by the WHO when classifying children with malnutrition into moderate (between -2 and -3 SD) and severe (-3SD) categories (Ambike et al., 2017). Low birth weight, insufficient nursing, inappropriate supplemental feeding, and recurring illnesses are risk factors for

under nutrition (Bhutta & Salam, 2012). Food insecurity has been reported to be the major contributing factor of global malnutrition (Hawkes & Fanzo, 2017).

This study concentrated on the objective of establishing the relationship between infant and young child feeding practices and the nutritional status of children aged 6-59 months in Kyegegwa in order to identify critical issues and support operational and policy decision making to improve efficiency in health programming and services prioritization regarding child health and nutrition that will promote healthy growth and wellbeing of the children within the district.

2. Materials and Methods

2.1 Methodology

A cross-sectional design using both qualitative and quantitative methods of data collection was used. The Kyegegwa Hospital young child clinic was the study location and focused on children (6-59 months) seeking medical care at the Hospital. The respondents were the mothers to children aged 6-59 months old at the time of the study who met the inclusion criteria. If a child did not have a defect that interfered with anthropometric measurement and the caretaker was present to give consent for inclusion, the child was eligible to participate.

The sample size was determined using the prevalence of underweight, which was 11% according to the UDHS 2016. This was calculated based on the following probability proportions formula

$$n = Z^2 pq / d^2$$

Convenience sampling was used to select the 150 study respondents. The child's weight and height were used to calculate WFH (wasting), which refers to the present nutritional status. A Mid-Upper arm circumference (MUAC) tape was used to evaluate the child's MUAC and a questionnaire that included questions on dietary diversity was used to track feeding patterns.

Simple random sampling was used to identify children between the ages of 6-59 months for the assessment of food consumption. The child's diet was tracked, including all of the foods, fruits, and vegetables consumed. By asking the mother how many times the child had solid, semi-solid, or soft foods in the 24 hours prior to the survey, the frequency of the child's meals was ascertained (Marriott et al., 2010).

Five Focus Group Discussions (FGD) with a maximum of 8 mothers chosen through non-probability (self-selection) sampling were conducted during clinic-hosted health education programs, preventing women from being delayed on arriving at the facility. The investigator facilitated the FGDs discussions by taking the participants through each topic for discussion one at a time. The challenges faced in feeding children, breastfeeding myths, water and sanitation, and medical care were discussed.

Food and personal hygiene observation was done using a checklist, this was also used to evaluate the indirect factors that affect the nutrition status for example the sanitation and hygiene practices like washing hands before offering food to a child.

A semi structured questionnaire was administered by an interviewer as the primary data collection tool. It was used to gather anthropometric data, food habits, and socio-demographic data. A 24-hour recall tool was also embedded in the general questionnaire to obtain data on dietary diversity. To obtain information on experiences and difficulties regarding infant and young child feeding especially myths, a focused group discussion guide, and a researcher observation checklist were employed.

2.2 Data Analysis

Qualitative data was recorded, transcribed and analyzed using NVivo. Data on dietary intake was collected using the 24-hour recall tool. All data from the questionnaires was entered in excel, exported and analyzed using both STATA and SPSS. Descriptive statistics were used to describe data on nutritional status, feeding practices, maternal and socio-demographic characteristics. Bivariate logistic regression was done to show relationship between independent variables and nutrition status. Significance level was set at <0.05. Multivariate logistic regression was done for variables found to be significant at the bivariate level.

3. Results and Discussion

3.1 Demographic and anthropometric characteristics of participants

The mean age, height, and weight of the children were 15.2 months, 76.9 cm, and 10.4 kg, respectively. The mean mid-upper arm circumference (MUAC) was 17.4 cm, with a minimum of 10 cm and a maximum of 21 cm. None of the children exhibited bilateral edema, a hallmark of severe acute malnutrition.

3.2 Feeding practices

As shown in Table 1, 79.3% of the children achieved adequate dietary diversity, consuming at least four different food groups. Slightly more than half were fed using cups and received three meals daily. Over half of the caregivers spent less than 30,000 UGX monthly on food, with starchy staples being the most frequently purchased food items (54.57%). The majority of

children (85.33%) were still breastfeeding, and 95.45% of those who had ceased breastfeeding did so after 12 months. Nearly all caregivers (99.33%) acknowledged the benefits of breastfeeding.

3.3 Common food groups consumed.

The most commonly consumed food groups within 24 hours prior to the survey were legumes, nuts, and seeds (79.19%), followed by white tubers (63.09%), cereals (58.39%), vitamin A-rich vegetables (56.38%), and milk or milk products (51.68%) (Table 3). Caregivers reported that food preparation was influenced by availability, family size, cost, and children's preferences (permissive feeding). A caregiver shared, *"I cook the kind of food my child likes,"* highlighting the role of food preferences in meal choices.

Table 1: Feeding and Dietary practices of the children

Variable	Frequency (n=150)	Percentage (%)
Dietary diversity		
Adequate	119	79.3
Inadequate	31	20.7
Child meal frequency		
2 times	25	16.7
3 times	103	68.7
4 times	16	10.7
5 times	6	4.00
Spending on food per week (UGX)		
Less than 30000	77	51.3
31000-70000	67	44.7
71000-150000	4	2.7
More than 150000	2	1.3
Kind of food bought		
Starchy staple	82	54.7
Legumes, pulses & nuts	33	22.0
Meat & fish	35	23.3

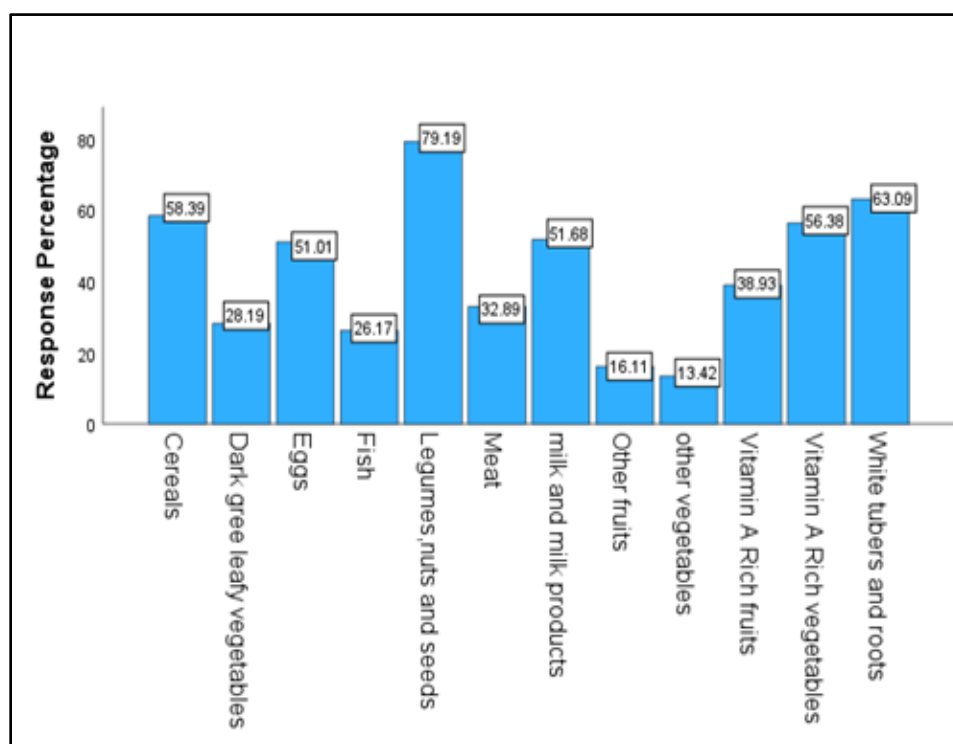


Fig 1. Common food groups fed to the children. Numbers in white rectangles show the percentage of responses

Table 2. Minimum meal frequency desecrated by age and breast-feeding status

Age (Month)	meals a day	Frequency (n)	Percentage (%)
6-8 month	2 times	15	30.6
	3 times	27	55.1
	4 times	6	12.2
	5 times	1	2.04
	2 times	10	13.2
9-24 month	3 times	52	68.4
	4 times	9	11.8
	5 times	5	6.6
Non-breastfeeding mothers	3 times	3	100

3.4 Complementary feeding practices

The average meal frequency was three meals per day. Among children aged 9-24 months, 68.42% ate three meals daily, compared to 55.10% of children aged 6-8 months (Table 2). All children aged 9-24 months who were no longer breastfeeding received three meals daily. These findings align with a study in Ethiopia that reported most children had fewer than four meals daily (Silva et al., 2017). However, a study in northwest Ethiopia found lower meal frequency among children, likely due to

differences in study settings and caregiver education levels (Belew et al., 2017).

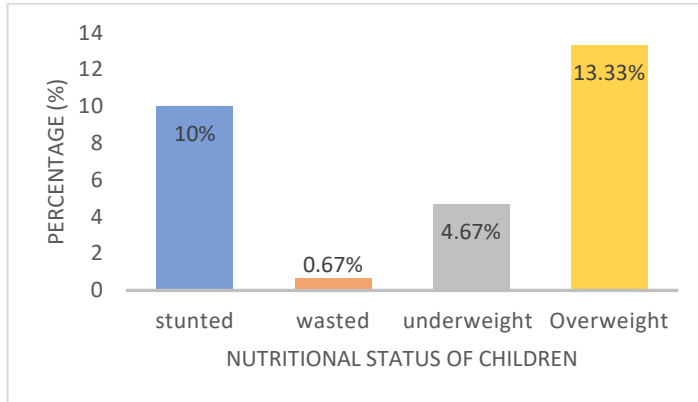


Fig. 2. Nutritional status of children 6-59 months of age

3.5 Factors associated with nutritional status

Table 3 shows that meal frequency was significantly associated with child stunting ($p < 0.05$). The majority of stunted children, 10 (66.7%), consumed three meals per day. However, no statistically significant associations were observed between stunting and factors such as mode of feeding, breastfeeding status, dietary diversity, or types of food purchased. For children aged 9–23 months, there was a significant relationship between stunting and meal frequency ($p = 0.001$) (Table 4). This study highlights a substantial association between meal frequency and stunting, with three meals per day being linked to a higher risk of stunting among female infants aged 6–12 months. Similarly, a study conducted in Pakistan found that female children were more likely to be stunted than males (Khuwaja et al., 2005). Additionally, research by Gilano et al. (2022) identified that 10% of the study population was stunted, with multivariate analysis revealing that the most significant factors were the sex of the child (male) and breastfeeding duration (more than 12 months). Differences in stunting prevalence between studies could be attributed to variations in the study area, sample size, and

caregiver feeding practices. Although the stunted children in this study may have met the World Health Organization's (WHO) recommended meal frequency—two or more meals per day for breastfeeding infants aged 6–8 months and three meals per day for those aged 9–12 months—the district's coping mechanisms, such as reducing portion sizes, may have resulted in insufficient food intake, contributing to stunting.

There was also a significant relationship between breastfeeding status and wasting ($p = 0.031$) (Table 6). Non-breastfed children were more likely to be wasted compared to their breastfeeding counterparts. The study found that 0.67% of the population was wasted, a figure notably lower than the 6% prevalence reported in a systematic review by Thurstans et al. (2022). This difference could be attributed to better hygiene and sanitation practices, as well as reduced infection rates, in the study population. The majority of wasted children (71.4%) were males aged 6–12 months. Wasting was also significantly associated with breastfeeding cessation ($p = 0.031$). Children who had stopped breastfeeding were more likely to be wasted, consistent with findings from a Kenyan study (Muchina & Waithaka, 2010) but differing from research in Pakistan, which reported no significant association between wasting and breastfeeding (Syeda et al., 2021). Among wasted children, most had adequate dietary feeding (6, 85.7%), came from families primarily purchasing starchy foods (4, 57.1%), and had ceased breastfeeding for over 12 months. Additionally, more than half of the wasted children were fed using a cup (4, 57.1%) and consumed three meals a day (6, 85.7%). Further analysis revealed no significant relationship between complementary feeding practices and wasting among children aged 6–59 months in Kyegegwa district. However, the reliability of the household water source was significantly associated with wasting (Table 7). Most wasted children came from families with unreliable water sources (4, 57.14%), particularly those relying on spring water (6, 85.71%) and using open-pit latrines (7, 100%).

Table 3. Bivariate analysis of the feeding practices associated with stunting of children aged 6-59 months

Variable	N (%)	Stunting Status		P value
		Stunted n (%)	Normal n (%)	
Dietary diversity				
Adequate	119 (79.3)	13 (86.7))	106 (78.5)	0.460
Inadequate	31 (20.7)	2 (13.3)	29 (21.5)	
Spending on food				
Less than 30,000	77 (51.3)	9 (60.0)	68 (50.4)	0.193
31000-70000	67 (44.7)	5 (33.3)	62 (45.9)	
71000-150000	4 (2.7)	0 (0.0)	4 (3.0)	
More than 150,000	2 (1.3)	1 (6.7)	1 (0.7)	
Currently Breast Feeding				
Yes	128 (85.33)	13 (86.67)	115 (85.19)	0.878
No	22 (14.67)	2 (13.33)	20 (14.81)	

Child meal frequency				
2 times	25 (16.7)	1 (6.7)	24 (17.8)	0.008
3 times	103 (68.7)	10 (66.7)	93 (68.9)	
4 times	16 (10.7)	1 (6.7)	15 (11.1)	
5 times	6 (4.00)	3 (20.0)	3 (2.2)	
*p<0.05				

Table 4. Relationship between stunting and meal frequency

Variable	N (%)	Stunting Status		P value
		Stunted n (%)	Normal n (%)	
Meal frequency (6-8 months)				
2 times	15 (30.6)	1 (25.0)	14 (31.1)	0.806
3 times	27 (55.1)	3 (75.0)	24 (53.3)	
4 times	6 (12.4)	0 (0.0)	6 (13.3)	
5 times	1 (2.0)	0 (0.0)	1 (2.2)	
Meal frequency (9-24 months)				
2 times	10 (13.6)	0 (0.0)	10 (14.5)	0.001*
3 times	52 (68.4)	3 (42.9)	49 (71.0)	
4 times	9 (11.8)	1 (14.3)	8 (11.6)	
5 times	5 (6.6)	3 (42.9)	2 (2.9)	
*p<0.05				

Table 5: Multivariate analysis of Factors associated with stunting among children aged 6-59 months

Variable	COR (95%CI)	P value	AOR (95% CI)	P value
Meal frequency				
5 times	Ref			
2 times	0.04 (0.003-0.53)	0.015	0.05 (0.002-1.23)	0.068
3 times	0.10 (0.01-0.60)	0.011	0.24 (0.034-1.68)	0.151
4 times	0.06 (0.005-0.88)	0.040	0.07 (0.003-1.73)	0.105
Ethnicity				
Muganda	Ref			
Musoga	1	-	-	-
Munyankole	1	-	-	-
Munyolo	0.9 (0.06-12.58)	0.938	0.90 (0.05-16.52)	
Mukiga	1	-	-	-
Mutooro	0.56 (0.10-3.01)	0.508	0.57 (0.09-3.35)	
Other	9	0.130	17 (0.50-600.14)	
*p<0.05 COR-Crude odds ratio, AOR-adjusted odds ratio Ref-Reference category				

Table 6. Bivariate analysis of the complementary feeding practices associated with wasting of children aged 6-59 months

Variable	N (%)	Wasting status		P value
		Wasted n (%)	Normal n (%)	
Dietary diversity				
Adequate	119 (79.3)	6 (85.7)	113 (79.0)	0.669
Inadequate	31 (20.7)	1 (14.3)	30 (21.0)	
Currently Breast Feeding				
Yes	128 (85.3)	3 (42.9)	19 (13.3)	0.031
No	22 (14.7)	4 (57.1)	124 (86.7)	
If not at what age did you stop				
Up to 12 months	1 (4.5)	0	1 (5.3)	0.684
More than 12 months	21 (94.5)	3 (100.0)	18 (94.7)	

*p<0.05

Table 7: Bivariate analysis of the Hygiene and sanitation factors associated with wasting among children aged 6-59 months

Variable	N (%)	Wasting status		P value
		Wasted n (%)	Normal n (%)	
Reliability of water supply				
Yes	125 (83.33)	1 (14.29)	14 (9.79)	0.049*
No	15 (10.0)	4 (57.14)	121 (84.62)	
Sometimes	10 (6.67)	2 (28.57)	8 (5.59)	
Rubbish disposal				
Open pit	48 (32.00)	2 (28.57)	46 (32.17)	0.670
Open pit and burnt	80 (53.33)	5 (71.43)	75 (52.45)	
No particular place	10 (6.67)	0 (0.00)	10 (6.99)	
Garbage collection	12 (8.00)	0 (0.00)	12 (8.39)	

*P<0.05

The study found that 13.33% of the population was overweight (Fig. 2). Comparatively, research conducted in the Czech Republic reported overweight prevalence among children under five at 8.3%, which is lower than our findings. However, studies from Greece and Italy reported prevalence rates of 16% and 12.7%, respectively, in their analysis of overweight and obesity in infants and preschool children in the European Union (Cattaneo et al., 2010). These differences could stem from variations in dietary habits, particularly the consumption of sugary foods, which are common in high-income households. Most overweight children in this study were fed using either a cup and spoon or a cup alone, a practice that promotes proper hygiene. However, permissive feeding styles by parents—identified during focus group discussions—may have contributed to higher calorie intake. Parents often allowed children to choose their preferred foods, which tended to be calorie-dense. This finding aligns with research showing that

indulgent or uninvolved parental feeding styles negatively impact children's intake of nutrient-rich foods while increasing consumption of less nutritious options, such as sugary snacks (Hoerr et al., 2009). Seventy percent of overweight children were fed three times a day. While some studies have found that frequent meals reduce obesity risk in children, others report conflicting results. For instance, three out of five observational studies involving 13,998 children and adolescents in the United States, Germany, and Portugal found a significant reduction in obesity risk with more frequent meals, but the remaining two studies found no significant association (Koletzko & Toschke, 2010).

During focus group discussions, mothers highlighted several factors influencing food choices, including household income, family size, and children's food preferences. Children were often fed starchy or sugary foods when these were their preferred

options, increasing the risk of overweight over time. The study found that most households spent 30,000 UGX or less per month on food, leading to the frequent purchase of cheaper, starchy staples. This finding corresponds with a study in Ghana that linked energy-dense diets to childhood overweight and obesity (Amevinya et al., 2022). However, a longitudinal study in Europe found no such association (Pala et al., 2013).

Five focus group discussions were conducted with mothers of children aged 6–59 months. Topics included myths about breastfeeding, factors influencing food preparation, challenges in breastfeeding, and childhood illnesses. Participants commonly believed that breastfeeding beyond two years improves children's academic performance and that breastfeeding while pregnant causes kwashiorkor. Most participants used spring water, which they described as unhygienic. One mother stated, “*I fetch water from the spring, and it is dirty—animals drink directly from it.*” Some mothers were observed offering food to their children without washing their hands, despite having access to handwashing facilities. Hygiene practices varied among participants, with some demonstrating good habits and others showing a lack of personal hygiene.

The study also revealed that 4.67% of the population was underweight (Fig. 2). This is lower than the 8% prevalence reported in Eastern Europe (Garrido-Miguel et al., 2021) and the 14.5% prevalence found in Indonesia (Syahrul et al., 2016). This difference may be attributed to better meal frequency and dietary diversity in the study population. However, underweight cases in this study were linked to insufficient calorie intake, driven by high food prices and coping strategies such as borrowing food from neighbors. Inadequate breastfeeding may also contribute to underweight in infants, as some mothers reported difficulty producing enough milk. Additionally, picky eating habits were identified during focus group discussions as a factor limiting children's food intake.

Conclusion

The study identified common complementary feeding practices among children aged 6–59 months, including feeding with a cup (52%), consuming three meals in the past 24 hours (63.2%), and eating vitamin A-rich vegetables. The prevalence of stunting, underweight, and overweight in this age group was 4.67%, 10%, and 13.3%, respectively. Key factors significantly associated with the nutritional status of these children included meal frequency, the reliability of water supply, and the type of toilet facilities. This study highlights the need to educate mothers about the recommended meal frequency for children, based on their age: two meals daily for children aged 6–8 months, three meals for those aged 9–24 months, and four meals for children no longer breastfeeding. Integrating this guidance into health and nutrition education sessions at young child clinics could be highly beneficial.

Additionally, incorporating food and cooking demonstrations into the nutrition unit of Kyegegwa Hospital would empower mothers with practical skills to meet their children's nutritional needs, even in resource-constrained settings. Further research is recommended to explore complementary feeding practices in communities that do not regularly visit healthcare facilities. A community-based study could provide valuable insights into infant and young child feeding (IYCF) practices among caregivers who lack access to the nutritional knowledge typically shared during hospital visits.

Ethical considerations

Approval was sought from Kyegegwa Hospital, the Uganda National Council of Science and Technology, and the research ethics committee of Mbarara University of science and technology. The participants were given a written informed consent form in order to obtain their assent to take part in the study. Additionally, participant names were not used for identification; instead, random numbers were used.

Data Availability statement

The data used in this study is available upon request from the author

Conflict of interest

The authors declare that there is no conflict of interest.

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