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Original Article

Knowledge, Attitudes, and Practices of Parents and Caregivers of Children Under Five Years on Undernutrition Prevention and Management in Rubavu District, Rwanda

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Abstract

Background: Child undernutrition remains a major public health concern in low- and middle-income countries, adversely affecting children's growth, cognitive development, and long-term productivity. In Rwanda, stunting continues to affect approximately one-third of children under five years, highlighting persistent gaps in prevention and management efforts. Understanding caregivers' knowledge, attitudes, and practices (KAP) is essential for designing effective nutrition interventions.

Methods: A community-based cross-sectional study was conducted among 375 parents and caregivers of children aged 6–59 months in Rubavu District, Rwanda. The sample size was determined using Fisher's formula. Data were collected using a structured questionnaire assessing socio-demographic characteristics and KAP related to undernutrition. Descriptive statistics summarized participant characteristics, while chi-square tests and multivariable logistic regression were used to identify factors associated with caregiving practices. Ethical standards, including informed consent, confidentiality, and voluntary participation, were strictly observed.

Results: Female caregivers accounted for 55.8% of respondents, and 81.3% resided in rural areas. Nearly half (46.7%) had no formal education. Overall, 60.5% of caregivers demonstrated low knowledge of undernutrition, 34.7% had moderate knowledge, and only 4.8% had high knowledge. Positive attitudes toward undernutrition prevention and management were observed in 40.0% of participants and were significantly associated with higher knowledge levels ($p < 0.01$). Good caregiving practices were reported by 53.1% of respondents. Lower knowledge, limited education, male gender, and rural residence were significant predictors of poor practices. Caregivers with low knowledge were less likely to practice effective undernutrition management (AOR = 0.815, $p < 0.05$).

Conclusion: Caregiver knowledge and attitudes are critical determinants of effective undernutrition prevention and management. Targeted, education-focused, and culturally appropriate interventions particularly in rural settings are essential to improve child nutrition outcomes in Rwanda.

Keywords: Knowledge; Attitudes; Practices; Undernutrition; Caregivers; Children Under Five; Nutrition Prevention; Rwanda

Background

Undernutrition among children under five years of age continues to represent a critical global public health concern, particularly in low- and middle-income countries, where it remains a leading contributor to preventable childhood illness, mortality, and long-term developmental impairment. Inadequate nutrition during early childhood has lasting consequences, including restricted physical growth, delayed cognitive development, weakened immunity, and reduced economic productivity in adulthood. Globally, undernutrition is implicated in nearly six million child deaths each year. Recent estimates indicate that in 2022 alone, approximately 45 million children under five were affected by wasting, of whom more than 13 million suffered from severe wasting, underscoring the magnitude and persistence of this challenge (UNICEF et al., 2023).

The burden of child undernutrition is especially pronounced in sub-Saharan Africa, where structural and socioeconomic inequalities exacerbate nutritional vulnerability. Factors such as low levels of maternal education, household poverty, food insecurity, limited access to quality healthcare, and suboptimal infant and young child feeding practices continue to drive high rates of stunting, wasting, and underweight. A growing body of evidence highlights the pivotal role of caregivers' knowledge, attitudes, and practices in shaping child nutrition outcomes, particularly during the first five years of life—a period critical for growth and development (Adedokun & Yaya, 2021). Studies conducted across diverse settings, including Nepal, Ethiopia, Kenya, Namibia, Uganda, and Rwanda, consistently reveal deficiencies in caregiver understanding and inappropriate feeding behaviors that contribute to poor nutritional status among young children (Jacent, 2021).

In Rwanda, child undernutrition remains a significant public health issue despite sustained political commitment and the implementation of national nutrition strategies. National survey data show that nearly one-third of children under five are stunted, while 8% are underweight and 6% are overweight, reflecting the coexistence of multiple forms of malnutrition within the population (RDHS/NISR, 2020). The situation is more severe in Rubavu District, where stunting prevalence reaches 46.6%, exceeding national averages and indicating localized disparities in nutrition and child health outcomes (Nutritional City Ecosystem, 2021). Previous research in Rwanda suggests that insufficient caregiver knowledge, unfavorable attitudes, and deeply rooted cultural beliefs and practices

substantially contribute to inadequate child feeding and care, thereby increasing the risk of undernutrition (Ntakarutimana, 2021; WHO, 2020).

Although Rwanda has introduced several nutrition-focused interventions such as community-based nutrition programs, growth monitoring, and facility-based counseling persistent gaps remain in translating knowledge into sustained behavior change, particularly in rural and socioeconomically disadvantaged communities. A detailed understanding of caregivers' knowledge, attitudes, and practices is therefore essential for identifying modifiable risk factors and guiding the development of contextually appropriate and effective nutrition interventions.

Accordingly, this study sought to assess the level of knowledge among parents and caregivers regarding the prevention and management of undernutrition, examine their attitudes toward undernutrition prevention and treatment, and evaluate their feeding and caregiving practices for children under five years in Rubavu District, Rwanda. The findings are intended to provide evidence to support policymakers, health professionals, and non-governmental organizations in strengthening nutrition programming and improving child health outcomes. Addressing gaps in caregiver knowledge and attitudes is a critical step toward reducing undernutrition and achieving sustainable improvements in child nutrition and survival in Rwanda (Tuza et al., 2023).

Methods

Study Area

The study was carried out in Rubavu District, situated in Rwanda's Western Province along the northern shores of Lake Kivu and sharing a border with the Democratic Republic of Congo. The district covers an estimated surface area of 388.3 km² and comprises a mix of urban and rural settings. Gisenyi town serves as the district's main commercial center and tourism destination, while the surrounding sectors are predominantly rural and agriculture-based. This diversity provides a suitable context for examining variations in caregiving behaviors related to child undernutrition.

Study Design

A quantitative, community-based cross-sectional design was adopted to examine the knowledge, attitudes, and practices (KAP) of parents and caregivers concerning the prevention and management of undernutrition among children under five years of age. This design enabled the assessment of existing conditions and the identification of associations between caregiver characteristics and nutrition-related practices at a single point in time.

Study Population

The target population comprised parents and primary caregivers of children aged 6–59 months residing in Rubavu District who were affected by undernutrition. According to population projections, the district has an estimated

total population of 546,683 individuals, including approximately 63,413 children under five years of age, representing about 11.6% of the population.

Eligibility Criteria

Caregivers of children aged 6–59 months who were identified as undernourished and who consented to participate were included in the study. Caregivers of children outside the specified age range, those whose children were not undernourished, and individuals who declined to provide informed consent were excluded.

Sample Size Estimation

The sample size was determined using Fisher's formula, based on an assumed undernutrition prevalence of 33%, a 95% confidence level, and a 5% margin of error. This yielded a minimum required sample of 340 participants. To compensate for potential non-response, an additional 10% was added, resulting in an adjusted sample size of 374. Ultimately, data were collected from 375 caregivers.

Sampling Procedure

A stratified random sampling approach was employed to ensure representation from all administrative sectors within Rubavu District. The district was first stratified into rural and urban sectors. Lists of eligible caregivers were compiled within each stratum, after which simple random sampling was conducted using a lottery method. In total, 32 participants were selected from each of nine rural sectors, while 29 participants were selected from each of three urban sectors, resulting in a final sample of 375 respondents.

Data Collection Tool

Data were collected using a structured questionnaire divided into four sections: socio-demographic characteristics, knowledge, attitudes, and practices related to undernutrition prevention and management. The tool was adapted from an established KAP questionnaire developed by the Food and Agriculture Organization (FAO) and modified to reflect the local context. The questionnaire was initially developed in English, translated into Kinyarwanda, and subsequently back-translated to ensure accuracy and consistency. Data collection was facilitated using the Kobo Toolbox digital platform.

Data Collection Process

Two trained data collectors conducted face-to-face interviews with eligible participants. Responses were recorded directly into tablet devices using Kobo Toolbox, which enhanced data accuracy and minimized transcription errors. Regular supervision and daily checks were conducted to ensure data completeness and quality.

Reliability Assessment

The reliability of the data collection instrument was evaluated through a pilot study involving 38 caregivers who were not included in the main study. Both test–retest reliability and internal consistency were assessed using Pearson's correlation coefficient and Cronbach's alpha, respectively. A coefficient value of 0.70 or higher was considered acceptable.

Validity Assessment

Instrument validity was examined through a separate pilot test conducted among 34 caregivers in Rubavu District. Feedback from this process informed revisions aimed at improving clarity, relevance, and comprehensiveness. Content validity was quantified using the Content Validity Index (CVI), with values of 0.78 or above indicating adequate validity.

Data Analysis

Data collected through Kobo Toolbox were exported to Microsoft Excel and subsequently analyzed using SPSS version 21. Descriptive statistics were used to summarize socio-demographic variables and KAP scores. Attitudinal responses were measured using Likert-scale items, while knowledge and practice scores were categorized according to Bloom's cut-off criteria. Variables showing significant associations at the bivariate level ($p < 0.05$) were entered into a multivariable logistic regression model to identify independent predictors of caregiving practices. Results were presented as adjusted odds ratios (AORs) with 95% confidence intervals, and statistical significance was set at $p < 0.05$.

Ethical Considerations

Ethical approval was obtained from Mount Kenya University, Kigeme District Hospital, and Rubavu District authorities prior to data collection. Written informed consent was secured from all participants. Confidentiality and anonymity were strictly maintained throughout the study, and participation was entirely voluntary. Participants were informed of their right to withdraw from the study at any stage without any negative consequences.

Results

Socio Demographic characteristics of study respondents

The study examined the demographics of 375 parents and caregivers in Rubavu District, focusing on gender, age, residence, family size, education, employment, healthcare access, and religion. Females made up 55.7% of participants, reflecting cultural caregiving roles. Most caregivers were aged 25–44, suggesting parenting experience but limited access to current child health information. A large portion (81.3%) lived in rural areas,

where healthcare and nutrition services are often lacking. Family size varied, with 77.3% in households of 4–6 and 14.9% in larger families, possibly affecting food availability. Educational attainment was low—46.7% had no formal education suggesting the need for simple, visual-based interventions. Most were self-employed (69.1%), mainly in farming or informal businesses, indicating financial vulnerability. While 94.4% had health insurance, 5.6% remained uninsured. Religious affiliation was mostly Christian (73.6%), followed by Muslim (7.2%) and others (19.2%), indicating potential for faith-based initiatives to support nutrition efforts in communities.

Table1. Socio Demographic characteristics of study respondents

Category	**Frequency**	**% (%)**
Gender		
Male	166	44.3
Female	209	55.7
Total	**375**	**100.0**
Age of Parents and caregivers		
Less than 24	29	7.7
Between 25 and 34	183	48.8
Between 35 and 44	159	42.4
45 and Above	4	1.1
Total	**375**	**100.0**
Place of Birth		
Rural	305	81.3
Urban	70	18.7
Total	**375**	**100.0**
Family Members		
<3 Members	29	7.7
4-6 Members	290	77.3
>7 Members	56	14.9
Total	**375**	**100.0**
Education Level		
No Formal Education	175	46.7
Primary School	136	36.3
Secondary School & Above	64	17.1
Total	**375**	**100.0**
Occupation Status		
Self-employed	259	69.1
Employed	116	30.9
Total	**375**	**100.0**
Health Insurance		
Yes	354	94.4
No	21	5.6
Total	**375**	**100.0**

Religion		
Christian	276	73.6
Muslim	27	7.2
Other Churches	72	19.2
Total	**375**	**100.0**

Descriptive information about parents and caregivers of under five years' children' knowledge on under-nutrition prevention and management

The majority of caregivers in Rubavu District demonstrated strong knowledge of under-nutrition causes, treatment, and prevention. 97.9% linked malnutrition to imbalanced diets, and 90.9% could list at least two causes. 94.9% favored treatment at health facilities and regular growth monitoring. Breastfeeding knowledge was high, with over 95% supporting timely initiation and exclusive breastfeeding. Most understood the importance of hygiene and balanced meals. 92.0% recognized breastfeeding's emotional bond, and 95.2% supported hospitalization for severe cases. 95.5% endorsed immunization. However, only 58.4% and 63.2% could accurately define and give examples of balanced diets, indicating an area needing improvement.

Table 2. Descriptive information about parents and caregivers of under five years' children' knowledge on under-nutrition prevention and management

Question/Statement	Yes (Frequency, %)	No (Frequency, %)
Imbalanced diet as main cause of malnutrition	367 (97.9%)	8 (2.1%)
Caregiver able to state at least two among the list of things that cause child malnutrition	341 (90.9%)	34 (9.1%)
Should malnutrition be managed at health facility	356 (94.9%)	19 (5.1%)
Is it important to take the measurement of child height and weight every 3 months?	356 (94.9%)	19 (5.1%)
Should a neonate start breastfeeding within 1 hour of birth, and be exclusively breastfed for the first 6 months	359 (95.7%)	16 (4.3%)
Should an infant start complementary food at 6 months, and should lactating mothers take healthy food	360 (96.0%)	15 (4.0%)
Is it important to wash your breast before breastfeeding	350 (93.3%)	25 (6.7%)
Should a balanced meal be given to the child instead of a snack	361 (96.3%)	14 (3.7%)
Could the bond between mother and child developed during breastfeeding help prevent malnutrition	345 (92.0%)	30 (8.0%)

Could a child be hospitalized for severe malnutrition	357 (95.2%)	18 (4.8%)
Is immunization the best way to protect the child from infectious diseases which are major causes of malnutrition	358 (95.5%)	17 (4.5%)
Could you cite the types of food in a balanced diet	219 (58.4%)	156 (41.6%)
Could you give an example for each type of food in a balanced diet	237 (63.2%)	138 (36.8%)

Overall scores of study respondent's knowledge on under-nutrition prevention and management

The data on total knowledge scores categorizes caregivers' understanding of child malnutrition prevention and management into three levels low, moderate, and high based on Bloom's taxonomy-inspired cutoffs for cognitive mastery. Bloom's taxonomy, has been used to provide a framework for assessing knowledge levels. The study found that 60.5% of caregivers had low knowledge of child malnutrition, 34.7% had moderate knowledge, and only 4.8% had high knowledge. With 95.2% scoring below high, there is a clear need for structured education programs to improve understanding and support effective malnutrition interventions in communities.

Table 3. Overall scores of study respondent's knowledge on under-nutrition prevention and management

Knowledge Level	**Frequency (%)**
Low knowledge level (=<60% scores)	227 (60.5%)
Moderate knowledge level (61-80% scores)	130 (34.7%)
High knowledge level (=>81% scores)	18 (4.8%)
Total	**375 (100.0%)**

Descriptive information about parents and caregivers of under five years' children' attitude towards on under-nutrition prevention and management

The study in Rubavu District showed strong caregiver support for recommended child nutrition practices. Most agreed on early initiation (92.0%) and exclusive breastfeeding for six months (88.5%), while 86.1% opposed early non-breast milk feeding. Structured meals (91.2%) and frequent breastfeeding (90.4%) were widely supported, though only 10.1% favored breastfeeding until age two. Balanced diets were valued (87.7%), with 89.3% recognizing the risks of starchy-only diets, and 90.1% supporting indigenous foods. However, 29.9% believed malnutrition could be caused by witchcraft, highlighting persistent cultural misconceptions.

Table 4. Descriptive information about parents and caregivers of under five years' children' attitude towards on under-nutrition prevention and management

Questions	Strongly Disagree (n, %)	Disagree (n, %)	Neutral (n, %)	Agree (n, %)	Strongly Agree (n, %)
Do you believe that breastfeeding should start immediately after delivery?	1 (0.3%)	5 (1.3%)	9 (2.4%)	345 (92.0%)	15 (4.0%)
Do you think babies should not be given anything except BF ≤ 6 months?	2 (0.5%)	4 (1.1%)	8 (2.1%)	332 (88.5%)	29 (7.7%)
Do you think a child couldn't be given butter, sugar, and water ≤ 6 months?	1 (0.3%)	4 (1.1%)	10 (2.7%)	323 (86.1%)	37 (9.9%)
Do you think complementary feeding should be started after 6 months?	319 (85.1%)	0 (0.0%)	6 (1.6%)	0 (0.0%)	50 (13.3%)
Do you think a formal meal is more convenient than a snack?	0 (0.0%)	2 (0.5%)	4 (1.1%)	342 (91.2%)	27 (7.2%)
Do you think BF should continue up to 2 years?	0 (0.0%)	0 (0.0%)	337 (89.9%)	0 (0.0%)	38 (10.1%)
Do you think a child below six months should be breastfeeding 10 or more times in 24 hours?	1 (0.3%)	0 (0.0%)	7 (1.9%)	339 (90.4%)	28 (7.5%)
Do you believe that serving balanced foods prevents malnutrition risk?	1 (0.3%)	2 (0.5%)	2 (0.5%)	329 (87.7%)	41 (10.9%)
Do you think serving only starchy food could cause malnutrition?	1 (0.3%)	0 (0.0%)	4 (1.1%)	335 (89.3%)	35 (9.3%)
Do you believe that Malnutrition couldn't be caused by witchcraft or bad spirit?	112 (29.9%)	0 (0.0%)	3 (0.8%)	213 (56.8%)	47 (12.5%)
Do you believe that serving indigenous fruit/vegetable can keep children healthy?	3 (0.8%)	0 (0.0%)	3 (0.8%)	338 (90.1%)	31 (8.3%)

Summary scores of parents and caregivers of under five years' children' attitude towards on under-nutrition prevention and management

Among the 375 participants, 60.0% (225 individuals) showed a negative attitude toward preventing and managing undernutrition, suggesting many caregivers may hold unfavorable views due to misinformation, cultural norms, or socio-economic barriers. Conversely, 40.0% (150 participants) demonstrated a positive attitude, reflecting better awareness, education, or access to supportive resources.

Table 5. Summary scores of parents and caregivers of under five years' children' attitude towards on under-nutrition prevention and management

Attitude category	Frequency	Percent
Negative Attitude	225	60.0%
Positive Attitude	150	40.0%
Total	375	100.0%

Descriptive information parents and caregivers about current practices on under-nutrition prevention and management

Most caregivers (65.6%) initiated breastfeeding within the first hour after birth, though 34.4% delayed. Exclusive breastfeeding was common (96.8%), but 44.0% introduced solids before six months. Meal frequency and hygiene varied, with only 28.5% feeding over three times daily and 29.3% practicing hygiene frequently. Balanced diets were inconsistently prepared, with 6.1% not preparing them at all. Vaccination rates were high (90.7%), and 91.7% used nutritional supplements, though 27.7% relied on traditional healers. Targeted education is needed to improve practices and child health outcomes. Among 375 participants, 46.9% showed poor practice levels, suggesting challenges in consistently applying recommended child nutrition and care practices. Meanwhile, 53.1% demonstrated good practices, reflecting better understanding and adherence. This near-even split indicates progress but also highlights the need to address barriers limiting full implementation of best practices.

Table 6. Descriptive information parents and caregivers about current practices on under-nutrition prevention and management

Question	Response	Frequency	Percent
At what time you started Breast feeding after birth	After hour	129	34.4
	Within hour	246	65.6
How many times have you breastfed your child in last 24 hours	Less than 10 times	170	45.3
	More than 10 times	205	54.7
Have you Exclusively breastfed your child for the first 6 months	Yes	363	96.8
	No	12	3.2
When have you started complementary feeding	At six months	210	56.0
	Below six months	165	44.0
What is the Minimum meal frequency of complementary food for your child	Once	190	50.7

	Twice	78	20.8
	More than 3 times	107	28.5
How many times do you practice hygiene practices for child per day	Once	210	56.0
	Twice	55	14.7
	More than 3 times	110	29.3
How many times do you prepare a balanced diet for child	Every Diet	119	31.7
	Not prepared	23	6.1
	Sometimes	233	62.1
Do you feed your child more than 3 meals a day	Yes	361	96.3
	No	14	3.7
Has your Child received recommended vaccines at his/her age	Yes	340	90.7
	No	35	9.3
Where do you seek care for the child	At health facility	271	72.3
	Prayers	57	15.2
	Traditional healers	47	12.5
Do you take your child to health facility for nutritional supplement and vitamins	Yes	344	91.7
	No	31	8.3
Did you discuss with husband about child nutrition and feeding	Yes	238	63.5
	No	137	36.5

Summary of scores of parents and caregivers about current practices on under-nutrition prevention and management

The table presents the distribution of practice levels based on the total practice scores of participants, with scores categorized into two groups: Poor Practice Level (<=60% scores) and Good Practice Level (>=61% scores).

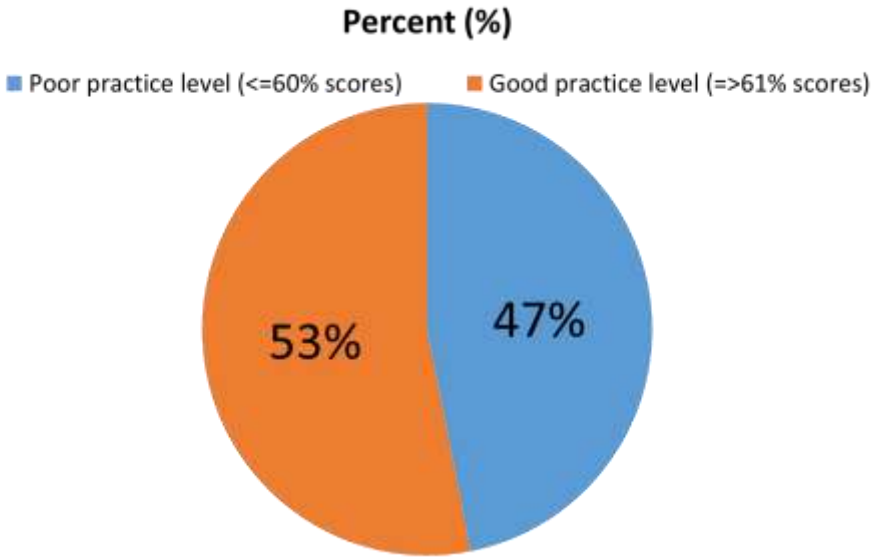

Figure1.Summary of scores of parents and caregivers about current practices on under-nutrition prevention and management

Distribution of practices in study respondents-based Socio Demographics characteristics and underlying factors

The study examined factors influencing caregiving practices, categorizing them as poor or good. Gender, place of birth, education, employment status, and religion significantly affected caregiving quality. Female caregivers, urban residents, those with secondary education or higher, employed individuals, and non-Christians were more likely to follow good practices. Knowledge and attitude strongly correlated with caregiving quality, with caregivers demonstrating better practices having higher knowledge and positive attitudes. Addressing gender, geographic disparities, and enhancing knowledge through education and training could improve caregiving practices and child health outcomes. Targeted interventions are necessary to support these changes.

Table 6. Distribution of practices in study respondents based Socio Demographics characteristics and underlying factors

	Practice levels		
Variable	**Poor**	**Good**	**P-Value**
Age of parents and caregivers			0.696
Less than 24	13	16	
Between 25 and 34	84	99	
Between 35 and 44	76	83	
45 and above	3	1	
Gender			0.001
Male	96	70	
Female	80	129	
Place of birth			0.001
Rural	170	135	

Urban	6	64	
Family members			0.103
< 3 members	9	20	
4-6 Members	136	154	
> 7 Members	31	25	
Education level			0.001
No Formal education	94	81	
Primary school	77	59	
Secondary school and above	5	59	
Occupation status			0.001
Self-employed	135	124	
Employed	41	75	
Health insurance status			0.607
Yes	165	189	
No	11	10	
Religion			0.001
Christian	156	120	
Muslim	13	14	
Other churches	7	65	
Knowledge levels			0.001
Low knowledge level	79	148	
Moderate knowledge level	93	37	
High knowledge level	4	14	
Attitude levels			0.001
Negative attitude	77	148	
Positive attitude	99	51	

Multivariate logistic analysis of factors associated with practices

Statistical analysis highlights key factors affecting caregiving practices. Gender significantly impacts behavior, with males 37.5% less likely to adopt good practices than females (p=0.001). Rural caregivers also had lower odds of good practices (AOR=0.356, p=0.001). Education played a role, with those without formal education showing lower odds of good practices (AOR=0.382, p=0.001). Occupation, religion, knowledge, and attitude also influenced caregiving behaviors. Negative attitudes led to lower odds of good practices (AOR=0.361, p=0.001). Targeted interventions addressing these factors could enhance caregiving practices and improve child health outcomes.

Table 7. Multivariate logistic analysis of factors associated with practices

Variable	Poor	Good	P-Value	AOR	95% C.I.
Gender			0.001		
Male	96	70		0.625	0.391 - 0.999
Female	80	129			

Place of birth			0.001		
Rural	170	135		0.356	0.068 -1.872
Urban	6	64			
Education level			0.001		
No Formal education	94	81		0.382	0.075 - 1.939
Primary school	77	59			
Secondary school and above	5	59		0.324	0.066 -1.589
Occupation status			0.001		
Self-employed	135	124		1.716	0.863 - 3.415
Employed	41	75			
Religion			0.001		
Christian	156	120		0.281	0.099 - 0.796
Muslim	13	14			
Other churches	7	65		0.471	0.132 - 1.685
Knowledge levels			0.001		
Low knowledge level	79	148		0.815	0.542 - 1.225
Moderate knowledge level	93	37			
High knowledge level	4	14			
Attitude levels			0.001		
Negative attitude	77	148		0.361	0.223 - 0.585
Positive attitude	99	51			

Discussion

The findings of this study underscore the influence of social, economic, and behavioral factors on caregivers' ability to prevent and manage undernutrition among children under five years of age. Gender-related roles emerged as a key determinant of caregiving behavior. Consistent with evidence from Ghana and Kenya, mothers were more actively involved in child feeding and health-related decisions, whereas fathers' contributions were largely limited to financial support, reflecting entrenched sociocultural norms that constrain male participation in direct child care (Sodzi-Tettey et al., 2023; Kaseje & Owino, 2022). These patterns suggest that nutrition interventions that fail to engage men may miss critical opportunities to improve household-level nutrition practices.

Educational attainment was strongly associated with caregiving quality. Caregivers with higher levels of formal education demonstrated greater awareness of child nutrition requirements and were more likely to adopt recommended feeding and health-seeking behaviors. Similar associations have been reported in other African settings, where education enhances health literacy and empowers caregivers to make informed decisions regarding child nutrition (Ndirangu & Kimenyi, 2024; McCabe & Morris, 2023). In contrast, caregivers with limited or no education—particularly those residing in rural areas—were more likely to practice suboptimal feeding behaviors, highlighting persistent inequities in access to nutrition information.

Employment conditions also shaped caregiving practices. Self-employed caregivers appeared to have greater autonomy and flexibility to attend to child nutrition needs, whereas formally employed caregivers often faced competing time demands that limited their engagement in child feeding and health care. These findings align with previous research from South Africa and India, which demonstrated that rigid work schedules can negatively affect caregivers' ability to implement optimal child care practices (Green & Innes, 2022; Patel & Thomas, 2023). Religious affiliation further influenced caregiving behaviors, with earlier studies indicating that faith-based beliefs may either reinforce positive health practices or, in some contexts, discourage the use of formal health services depending on prevailing doctrines and community norms (Zubair & Uddin, 2024; Tabbara & Yousuf, 2023).

Caregiver knowledge and attitudes were among the most influential factors associated with appropriate nutrition practices. Caregivers who possessed accurate knowledge of undernutrition causes and prevention strategies were more likely to provide balanced diets, seek timely medical care, and ensure that children received recommended immunizations. These findings are consistent with studies demonstrating that informed caregivers are better

equipped to protect children from nutrition-related illnesses (Hoque & Bante, 2023; Mwai & Kang'ethe, 2022). Moreover, positive attitudes toward child nutrition strengthened adherence to recommended practices, reinforcing the importance of behavior-change communication in nutrition programming (Singh & Mishra, 2024; Chisale & Manda, 2022). Conversely, economic constraints remained a major barrier, as caregivers from low-income households often struggled to access nutritious foods and essential health services (Kamara & Sesay, 2023; Alhassan & Bakshi, 2022).

Traditional beliefs and cultural perceptions were also identified as important influences on child feeding behavior. In some cases, these beliefs conflicted with biomedical explanations of undernutrition, leading to delays in seeking appropriate care. Similar challenges have been documented in other African contexts, where misconceptions regarding the causes of malnutrition undermine effective prevention and treatment efforts (Kofi & Owusu, 2024; Ochieng & Ouma, 2023). Nevertheless, evidence suggests that culturally sensitive health education initiatives and supportive policy frameworks can successfully address these challenges and improve child nutrition outcomes (Williams & Brown, 2023; Daniels & Muya, 2023).

Conclusion

This study demonstrates that caregivers' knowledge and attitudes are fundamental to effective undernutrition prevention and management among children under five years in Rubavu District, Rwanda. Key socio-demographic characteristics including gender, education, occupation, and residential location were found to significantly influence caregiving behaviors. Caregivers who were female, better educated, and residing in urban areas consistently exhibited more appropriate nutrition and health practices. Furthermore, caregivers with adequate knowledge and favorable attitudes toward undernutrition were substantially more likely to engage in effective caregiving behaviors. These findings highlight the importance of addressing both informational gaps and structural inequalities to improve child nutrition outcomes.

Recommendations

The study recommends a coordinated, multi-sectoral response to improve child nutrition outcomes in Rubavu District. Priority should be given to strengthening community-based nutrition education, particularly for caregivers with low education and those in rural areas, while promoting active involvement of both men and women in child care. Health facilities should enhance nutrition counseling, growth monitoring, and outreach services. Economic support and livelihood programs are needed to improve household food security, alongside stronger collaboration across health, education, agriculture, and social sectors. Engaging community, religious,

and local leaders, as well as civil society organizations, is essential to foster behavior change, expand outreach, and ensure sustainable undernutrition prevention and management.

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Conflict of Interest

The authors declare that there is no competing financial, professional, or personal interests that could have influenced the conduct, analysis, interpretation, or reporting of this study.

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