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Contribution to the Study of the Determinants of Malnutrition in Children Aged 6 - 59 Months in the Case of Buhiga Commune, Karusi Province

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Abstract

Malnutrition plays a large role in half of all child deaths worldwide, which is more than any infectious disease and yet it is not an infection. It is a major public health problem in Burundi that risks hindering efforts for the country's future economic and social development. It leaves lasting after-effects in millions of survivors in the form of infirmity, chronic vulnerability to disease, and intellectual disability. It is a threat to women, families and societies as a whole, and a clear violation of children's rights. Our study aimed to identify the determinants of malnutrition in children aged 6 - 59 months in the Buhiga commune of the Karusi province, Burundi. This is a cross-sectional study with an analytical purpose on a sample of 130 cases meeting the inclusion criteria that was carried out in the different households of the Buhiga commune. The study covered a period of 4 months from March 1 to June 31, 2024. A survey questionnaire was sent to each respondent and completed by the interviewer during data collection. The parameters studied concerned sociodemographic factors, factors related to morbidity in children as well as behavioural and environmental factors. After collection, data entry was performed in the Excel version 2016. La sample description and logistic regression analysis of variables associated with malnutrition in children aged 6 - 59 months in Buhiga commune with the Odds Ratio and 95% confidence interval were performed using STATA 15.1 with a significant threshold of 0.05. The prevalence of malnutrition in children aged 6 - 59 months was 9.23% (95% CI, $p < 5\%$) and the significant variables ($p < 0.05$) associated with acute malnutrition in children aged 6 to 59 months in the commune Buhiga after multivariate analysis were: frequency of meals consumed (OR: 0.12, 95% CI: 0.02 - 0.69, p: 0.017), household size (OR: 10.4,

95% CI: 1.72 - 64, *p*: 0.011) and marital status (OR; 34.9, 95% CI: 1.111 - 1092, *p*: 0.043). Our study identified the determinants of malnutrition among children aged 6 - 59 months in the commune of Buhiga in the province of Karusi on which policymakers could focus their prevention strategies in order to reduce the prevalence of malnutrition in children aged 6 - 59 months and its consequences. At the end of our study**,** we suggest the following recommendations: 1) Through IEC activities, improve household nutrition behaviours. To promote education for the health of families on the nutritional value of food and on a balanced diet of sufficient quality and quantity. 2) Improve poverty reduction actions and strengthen activities in rural areas. Promote income-generating activities in families so that they can have enough to eat by grouping them in associations and granting them collective credits. 3) Provide additional meals per day for children under 5 years of age in families (more than 3 meals per day) if possible. 4) Promote family planning. 5) Include girls in sexual health education sessions in health care settings. 6) Advise free women with multiple sexual partners to always practice safe sex. 7) Educate girls of childbearing age on the need for sexual abstinence before marriage in order to avoid unwanted pregnancies.

Keywords

Determinants, Malnutrition, Children 6 - 59 Months, Buhiga Commune, Karusi Province, Burundi

1. Introduction

Malnutrition plays a large role in half of all child deaths worldwide, which is more than any infectious disease and yet it is not an infection. It leaves lasting aftereffects in millions of survivors in the form of infirmity, chronic vulnerability to disease, and intellectual disability. A threat to women, families and entire societies, it is a clear violation of human rights (Minisante, 2010).

An individual's health depends largely on how well they eat. There is an old saying that you have to eat to live, but still, you have to be able and "know" how to eat, because an unbalanced diet due to excess or lack of intake can be as harmful as a lack of food.

This imbalance is a real public health problem throughout the world. On the one hand, it can be overeating with its consequences on health such as obesity, diabetes, heart disease, and on the other hand, undernutrition which leads to malnutrition through deficiency commonly known as undernourishment or undernutrition.

As a result, our study will especially help food insecurity programs to identify the determinants of malnutrition in children aged 6 months to 59 months as well as the socio-economic and cultural constraints related to malnutrition and to act in accordance with the results obtained in order to achieve food security in the community.

This work will contribute to and enrich the database on the determinants of malnutrition among children aged 6 months to 59 months in the community in

order to promote child health.

Malnutrition increases the risk of death in this population by combining with other diseases that it often facilitates the occurrence of, such as: measles, ARI, diarrhoea, malaria, etc. (WHO, 2008).

The 2010 Demographic and Health Survey in Burundi showed that 58% of children under five were chronically malnourished, 28.8% were underweight and 5.8% were acutely malnourished. Indeed, chronic malnutrition has lasting consequences on children's cognitive abilities and consequently on the nation's vital forces (Minisante, 2011).

In accordance with the orientations of the Burundi 2025 Vision, the Second Generation Strategic Framework for Growth and Poverty Reduction (PRSP II) for the period 2012-2016, recalled that malnutrition is due to the poor performance of agricultural production and the dietary practices of the population, 67% of whom live below the national poverty line, according to the conclusions of the survey carried out in 2006 on the basic indicators of the well-being of the population. By the Government in collaboration with the University Research Centre for Economic and Social Development (CURDES) of the University of Burundi. Several activities are envisaged in the PRSP-II to address the immediate causes of malnutrition related to health and food security (Minisante, 2007).

Improving infant nutrition therefore seems to be a necessary condition for reducing the prevalence of chronic malnutrition. The choice of the Buhiga commune was motivated by the results of the SAMART 2022 survey which showed that the Buhiga commune is among the communes with a high rate of children under 5 years of age suffering from global acute malnutrition, i.e. 6.4% which is higher than the WHO standards of 5%.

This is why, aware of this public health problem affecting this population characterized by its vulnerability, we are motivated to undertake a study whose aim is to identify the factors at the origin of the frequency of malnutrition among children under five years of age in the Buhiga commune of the Karusi province in order to formulate appropriate suggestions.

The Malnutrition Analysis of Children under Five in Burundi is an important tool for refining our approaches to nutrition and improving the country's development outcomes (Minisante, 2012).

2. Study Method

2.1. The Framework of the study

Burundi is a country in East Africa. It borders Rwanda to the north, Tanzania to the south and east and the Democratic Republic of Congo (DRC) to the west. It is part of the Great Lakes region. Its surface area is 27,834 km^2, including 2700 km^2 of lakes and 23,500 km^2 of potentially agricultural land. The total population, according to the RGPH 2008 projections, is estimated at 11,215,578 inhabitants, of whom 5,500,949 are men and 5,714,629 are women. This population is distributed in 18 provinces, 119 communes and 2911 hills.

The commune of Buhiga, on which our study focused, is made up of three zones spread over 30 hills and 132 sub-hills.

The population of children aged 6 months to 59 months is 12,764 inhabitants in 2024 according to ISTEEBU's 2010-2050 municipal projections.

2.2. The Type, Period, Location and Population of the Study

This is a cross-sectional study with an analytical purpose that was carried out in the different households of the commune of Buhiga. The study covered a 4-month period from March 1 to June 31, 2024. A survey questionnaire was sent to each survey and completed by the interviewer during data collection.

The choice of the Buhiga commune was motivated by the results of the SA-MART 2022 survey which showed that the Buhiga commune is among the communes with a high rate of children under 5 years of age suffering from global acute malnutrition, i.e. 6.4% which is higher than the WHO standards of 5%.

The study population consisted of children aged 6 to 59 months at the time of the survey who were in different households in the hills of the Buhiga commune (Figure 1).

Figure 1. Political map of the commune of Buhiga Karusi Province.

2.3. Sampling Method

2.3.1. Sample Size

The prevalence of children aged 6 to 59 months with Global Acute Malnutrition assessed by weight-for-height and/or MUAC ratio is known and is 6.4% according to data reported in the 2022 SMART survey. This proportion was used to calculate

the sample size.

The sample size was determined using the following Schwartz formula.

$$n = \frac{z^2 Xp(1-p)}{e^2} \quad \text{(Schwartz, 1969)}$$

n = sample size;

Z = 95% z-score (1.96);

p = prevalence of acute malnutrition (0.064);

e = margin of error (4.3%);

n = 124.

Applying the 5% non-response, the sample size becomes 130, i.e. 130 households with children aged 6 to 59 months.

$$n = \frac{124.4X105}{100} = 130$$

The sample size of our study was 130 mothers or their guardians with children aged 6 to 59 months, i.e. 130 households in the commune of Buhiga.

2.3.2. Inclusion and Exclusion Criteria

1) Inclusion criteria

- All households with children aged 6 to 59 months at the time of the survey.

2) Non-inclusion criteria

- Households with children aged 6 to 59 months who have refused to give consent.
- Households with children under the age of 6 to 59 months.

2.3.3. Sampling Technique

Our study took place in all the areas of responsibility of the health centers located in the commune Buhiga using the technique of proportional allocation stratification, each area of responsibility being a stratum. To determine the number of children to be surveyed in each stratum, the 130 children in our sample were allocated proportionately based on the average number of children aged 6 to 59 months in each area of responsibility (Table 1).

Table 1. Distribution of the sample of children aged 6 - 59 months by size in each area of responsibility.

Area of responsibility	Number of children aged 6 to 59 months in each area of responsibility (N_i)	Sample by Area of Responsibility (n_i)
Karusi Area of Responsibility	3032	31
Buhiga Area of Responsibility	2681	27
RUDARAZA Area of Responsibility	2321	24
KANYANGE Area of Responsibility	1618	17
RUKAMBA Area of Responsibility	1209	12
RUTONGANIKWA Area of Responsibility	1903	19
Total	12,764 (N)	**130**

The sample by area of responsibility was identified using the following formula:

$$n_i = \frac{n}{N} * N_i \quad \text{(York House et al., 2024)}$$

With:

N_i: number of children to be included in the sample for each area of responsibility;

n: sample size to be drawn in all areas of responsibility of the Buhiga Health District;

N: Total number of children aged 6 - 59 months who are in the Buhiga community;

N_i: Total number of children aged 6 to 59 months in each area of responsibility of the Buhiga Health District.

2.4. Data Collection Tools and Techniques

The information was collected through a questionnaire that was sent to the children's mothers or their guardians. It is a structured questionnaire comprising 4 dimensions: a dimension related to sociodemographic factors, a dimension related to environmental and behavioral factors, and a dimension related to the child's morbidity.

The questionnaire has been translated into the national language to facilitate the respondent's understanding. Before completing the questionnaire, the interviewer began to explain the purpose of the survey and assured the respondent of the confidentiality of the information provided.

Prior to the interview, informed and written consent was obtained from the mothers who consented on behalf of their children. In cases where the mother was illiterate, verbal consent was obtained from the mother according to a detailed description of the protocol and written consent was obtained from her husband who consented in writing on behalf of the mother and child.

The questionnaires have been coded to maintain anonymity and confidentiality. Data collection was carried out from Monday to Friday (8 a.m. to 3 p.m.) on the identified hills until the required sample was obtained. After collection, data entry was performed in Excel version 2016.

2.5. Pre-Test

To test the understanding of the questionnaire (pre-test), the questionnaire was first sent to some households with children aged 6 to 59 months in the Bugenyuzi commune, then some questions were adapted and reformulated. The pre-test also made it possible to estimate the time needed to investigate a person.

2.6. Definition of Variables

2.6.1. Dependent Variable

The dependent variable for this study is global acute malnutrition which is a dichotomous variable that was determined using the mid-upper arm circumference using a tape measure coded by red, yellow, green colors, so we retained those with a MUAC < 115 mm, we also assessed the presence or absence of bilateral edema.

2.6.2. Independent Variables (Table 2, Figure 2)

The independent variables which has been tested and have significantly influenced the dependent variable on the one hand and other independent variables which have been associated with the dependent variable on the other hand are grouped in 3 headings, namely:

1) Socio-economic Characteristics;

2) Factors related to child morbidity;

3) Behavioral and environmental factors.

Table 2. Description of independent variables.

	Variables	Description	Operational definition/ Terms and conditions
		Socio-economic characteristics	
1.	Marital status	Qualitative variable that designates the marital status of parents with five modalities	• Single = 1 • Divorced = 2 • Widower = 3 • Married = 4 • Common-law union = 5
2.	Mother's level of education	Qualitative variable that shows the mother's level of education with 4 modalities	• Without = 1 • Primary = 2 • Secondary = 3 • University = 4
3.	Father's level of education	Qualitative variable that shows the father's level of education with 4 modalities	• Without = 1 • Primary = 2 • Secondary = 3 • University = 4
4.	Guardian of the child	Qualitative variable with six modalities	• His mother = 1 • His father = 2 • His grandmother = 3 • His grandfather = 4 • One person in the family = 5 • One person outside the family = 6
5.	History of the first birth	Qualitative variable with three modalities	• <18 years = 1 • Between 18 and 30 years old = 2 • 30 years and older = 3
6.	Sex of the child	Qualitative variable with two modalities	• Male = 1 • Female = 2
7.	Age of the child	Qualitative variable with three modalities	• Between 6 and 12 months = 1 • 12 and 36 months = 2 • 37 and 59 months = 3
8.	Respect for the birth interval	Qualitative variable with three modalities	• 1 - 2 years = 1 • 3 - 7 years old = 2 • Over 7 years = 3 years old

Continued

9.	Religion	Qualitative variable with four modalities	• Catholic = 1 • Prostitute = 2 • Muslim = 3 • Anglican = 4
10	Household size	Qualitative variable that shows the size of the family with three modalities	• 1 - 2 = 1 • 3 - 7 = 2 • Plus 7 = 3
		Factors related to child morbidity	
11.	Appetite at L' Enfant	Qualitative variable that shows whether the child has difficulties with eating meals with two modalities	• Yes = 1 • No = 2
12.	Digestive disorders	Qualitative variable that shows whether the child has been confronted with digestive disorders in relation to eating meals with two modalities	• Yes = 1 • No = 2
13.	Access to treatment	Qualitative variable that shows whether the child has easy access to health care with two modalities	• Yes = 1 • No = 2
14.	Episode of recurrent diarrhea	Qualitative variable with 2 modalities that refer to the notion of diarrhoea that is recurrent in children	• Yes = 1 • No = 2
15.	Presence of febrile peak (fever)	Qualitative variable with 2 modalities	• Yes = 1 • No = 2
16.	Presence of a chronic disease	Qualitative variable that shows whether the child is living with a chronic disease with 2 modalities	• Yes = 1 • No = 2
17.	Repeated malaria	Qualitative variable with 2 modalities that refer to the notion of malaria which is recurrent in children	• Yes = 1 • No = 2
18.	Repeated infection	Qualitative variable with 2 modalities that refer to the notion of repetitive infection in children	• Yes = 1 • No = 2
		Behavioural and environmental factors	
19.	Knowledge of the child's weaning period	Qualitative variable with three modalities that indicates when the child started to eat the family dish	• Before 6 months = 1 • 6 months = 2 • After 6 months = 3

Continued

20.	Type of care facility attended	Qualitative variable with three modalities that refers to knowledge of the place where one is being treated	• Known health training = 1 • Community Health Workers = 2 • Traditional practitioners or self-medication = 3
21.	Type of meal consumed	Qualitative variable with two modalities that indicate the type of food the child takes	• Family dish = 1 • Dish of its own = 2
22.	Frequency of meals in children	Qualitative variable that shows how the child feeds with three modalities	• 2 meals per day = 1 • 3 meals per day = 2 • More than 3 meals per day = 3
23.	Compliance with the vaccination schedule	Qualitative variable with two modalities that show whether the child has had all the recommended vaccines.	• Yes = 1 • No = 2
24.	Primary decision-maker in the household	A qualitative variable with three modalities that show whether the mothers of the children have a say in decision-making at the household level, especially in the management of household income, since they are the ones who are responsible for the nutrition of the children	• The husband decides alone = 1 • The woman decides alone = 2 • Husband and wife decide together = 3
25.	Source of income	Qualitative variable that shows the level of wealth of the household with four modalities	• Agriculture = 1 • Agriculture and livestock = 2 • Civil servants' salaries = 3 • Others = 4
26.	Intimate partner violence	Qualitative variable with two modalities that show whether the household is confronted with difficulties related to the disagreement between the husband and the mother	• Yes = 1 • No = 2
27.	Well-appointed latrine	Qualitative variable with two modalities that show whether there is a clean latrine that meets all the sanitary conditions in the household	• Yes = 1 • No = 2
28.	Compliance with Good Hand Hygiene Practices	Qualitative variable that shows whether hygiene conditions are well met to prevent dirty hand diseases with 2 modalities	• Respected = 1 • Not met = 2
29.	Knowledge of the number of times the child is breastfed per day	Qualitative variable that indicates the frequency of breastfeeding per day in number with 2 modalities	• Who = 1 • No = 2

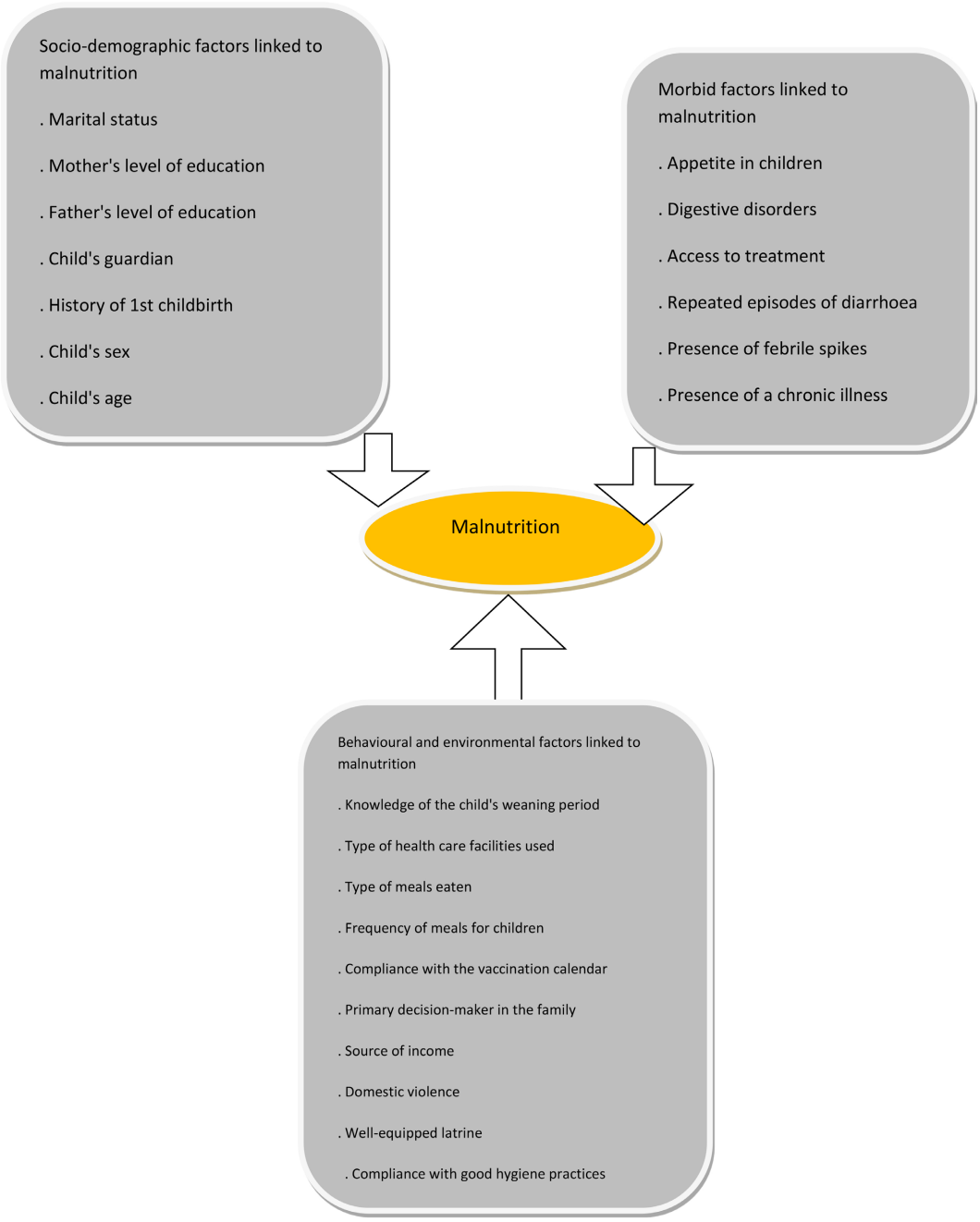

Figure 2. Conceptual framework of malnutrition among children aged 6 - 59 months in Buhiga commune.

2.7. The Results Analysis Plan

A database was built using Excel 2016 and the data was exported to STATA for analysis. After the data was entered, the data was pre-processed to assess the quality of the information entered, including checking the normality of the data. If quantitative data were missing, they were replaced by the mean or median for variables with a normal and abnormal distribution, respectively. For qualitative data, they have been replaced by a frequent modality. Outliers were also corrected prior to the actual analysis.

Subsequently, the data analysis was carried out as follows:

- For descriptive analysis (univariate analysis), the following measures were calculated: proportion for qualitative variables, mean and standard deviation for quantitative variables following a normal distribution; median and interquartile range for quantitative variables that do not follow a normal distribution
- In bivariate analysis, each independent variable was cross-referenced with the dependent variable. The exact Fisher test was used to test the significance of associations when at least one of the theoretical values was less than 5, elsewhere the chi2 test was used. The odds ratio, *p*-value and 95% confidence interval were also calculated to test the statistical significance, meaning and strength of the associations of the observed differences between the proportions of the different modalities with respect to the dependent variable;
- Logistic regression was applied and eliminated confounding factors. Variables with a significant *p*-value (<5%) and those with a *p*-value of less than 20% were integrated into the initial model with top-down elimination of variables with $p > 0.05$.
- After modelling, the best model with a low CSA was selected as containing variables considered to be factors influencing the occurrence of acute malnutrition in children aged 6 to 59 months in the commune of Buhiga. Only variables of which $p < 0.05$, at this stage, have been taken as the determinants of acute malnutrition.
- Finally, a ROC curve was used to discriminate between children aged 6 to 59 months with acute malnutrition and those without acute malnutrition.

2.8. Internal and External Validity

2.8.1. Internal Validity

Different strategies have been set to minimize or avoid possible biases:

- The list of health centers and areas of responsibility was found in the commune of Buhiga.
- A 95% confidence interval was used with a margin of error set at least 5%.
- Bivariate analysis and multivariate analysis were done to study the influence of the different independent variables on the dependent variable.

2.8.2. External Validity

The results of the study were extrapolated to all children aged 6 to 59 months in the Buhiga commune.

3. Presentation and Discussion of Results

The frequency of global acute malnutrition among children aged 6 - 59 months in the Buhiga commune of the Karusi province is 12 children out of the total of 130 children sampled, which makes a prevalence rate of 9.23% of acute malnutrition among children aged 6 - 59 months in the commune Buhiga (**Figure 3**).

The presentation of the results of this study is based on the following 3 points:

I. Descriptive analysis (univariate analysis).

II. Bivariate analysis.

III. Multivariate analysis.

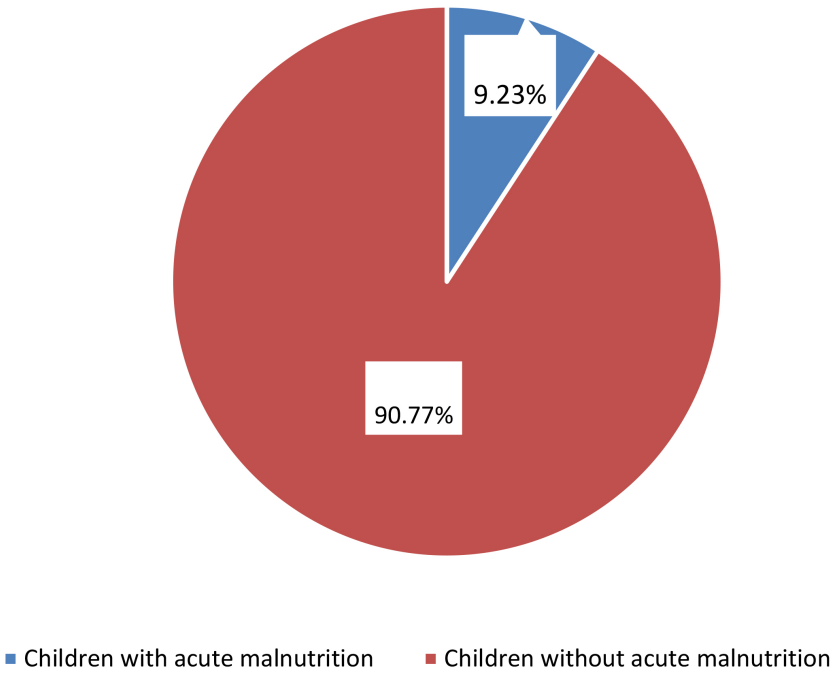

Figure 3. Prevalence of acute malnutrition among children aged 6 - 59 months in Buhiga commune.

3.1. Descriptive Analysis of the Sample (Univariate Analysis)

Table 3 shows that the variables Father's Education Level ($p = 0.023$), Mother's Education Level ($p = 0.000$), Child Age ($p = 0.008$) and Household Size ($p = 0.000$) are associated with acute malnutrition.

Table 3. Characteristics of the sample ($n = 130$) according to sociodemographic factors of children aged 6 to 59 months in the commune of Buhiga.

		Acute malnutrition			
Variable	***n* (%)**	**Yes**	**No**	**Chi²**	***p*-value**
Marital Status				**6.9074**	**0.141**
Bachelor	1 (0.77)	0 (0)	1 (0.85)		
Married	118 (90.77)	9 (75.00)	109 (92.37)		
Divorced	1 (0.77)	0 (0)	1 (0.85)		
Cohabitation	5 (3.85)	2 (16.67)	3 (2.54)		
Widower	5 (3.85)	1 (8.33)	4 (3.39)		
Mother's level of education				**9.5127**	**0.023**
Without	37 (28.46)	8 (66.67)	29 (24.58)		
Primary	72 (55.38)	3 (25.00)	69 (58.47)		

Continued

Secondary	20 (15.38)	1 (8.33)	19 (16.1)		
University	1 (0.77)	0	1 (0.85)		
Father's level of education				**41.5377**	**0.000**
Without	22 (16.92)	10 (83.33)	12 (10.17)		
primary	94 (72.31)	2 (16.67)	92 (77.97)		
Secondary	14 (10.77)	0 (0.00)	14 (11.86)		
History of the first birth				**60.6500**	**0.564**
<18 years old	9 (6.92)	7 (58.33)	2 (1.69)		
Between 18 and 30 years old	115 (88.46)	3 (25.00)	112 (94.92)		
30 years and older	6 (4.62)	2 (16.67)	4 (3.39)		
Sex of the child				**0.1136**	**0.736**
Boy	71 (54.62)	6 (50.00)	65 (55.08)		
Daughter	59 (45.38)	6 (50.00)	53 (44.92)		
Age of the child				9.6230	0.008
Between 6 and 12 months	31 (23.85)	7 (58.33)	24 (20.34)		
12 and 36 months	18 (13.85)	2 (16.67)	16 (13.56)		
37 and 59 months	81 (62.31)	3 (25.00)	78 (66.10)		
Birth interval respected				**16.4259**	**0.765**
No	41 (31.54)	10 (83.33)	31 (26.27)		
Yes	89 (68.46)	2 (16.67)	87 (73.73)		
Household size				**21.3823**	**0.000**
1 - 2	0 (0.00)	0 (0.00)	0 (0.00)		
3 - 7	95 (73.08)	2 (16.67)	93 (78.81)		
More than 7	35 (26.92)	10 (83.33)	25 (21.19)		
Religion				**1.8733**	**0.759**
Catholic	90 (69.23)	7 (58.33)	83 (70.34)		
Protestant	22 (16.92)	3 (25.00)	19 (16.10)		
Anglican	5 (3.85)	1 (8.33)	4 (3.39)		
Muslim	4 (3.08)	0 (0.00)	4 (3.39)		
Other	9 (6.92)	1 (8.33)	8 (6.78)		
Birth order				**0.0446**	**0.833**
First child	19 (14.62)	2 (16.67)	17 (14.41)		
Other Rank	111 (85.38)	10 (83.33)	101 (85.59)		

Table 4 above shows that the variables Digestive disorders ($p = 0.008$) and Recurrent malaria ($p = 0.001$) are associated with acute malnutrition.

Table 4. Characteristics of the sample (n = 130) according to the morbidity factors of the child aged 6 to 59 months in the commune of Buhiga.

		Acute malnutrition			
Variable	***n* (%)**	**Yes**	**No**	**Chi²**	***p*-value**
Digestive disorders				**7.0950**	**0.008**
Yes	79 (60.77)	3 (25.00)	76 (64.41)		
No	51 (39.23)	9 (75.00)	42 (35.59)		
Access to treatment				**0.6161**	**0.432**
Yes	96 (73.85)	10 (83.33)	86 (72.88)		
No	34 (26.15)	2 (16.67)	32 (27.12)		
Episode of diarrhea				**0.0147**	**0.904**
Yes	88 (68.22)	8 (66.67)	80 (68.38)		
No	41 (31.78)	4 (33.33)	37 (31.62)		
Presence of febril-spike				**0.0731**	**0.787**
Yes	82 (63.08)	8 (66.67)	74 (62.71)		
No	48 (36.92)	4 (33.33)	44 (37.29)		
Presence of chronic disease				**0.8669**	**0.352**
Yes	122 (93.85)	12 (100.00)	110 (93.22)		
No	8 (6.15)	0 (0.00)	8 (6.78)		
Repeated malaria				**11.7262**	**0.001**
Yes	81 (62.31)	2 (16.67)	79 (66.95)		
No	49 (37.69)	10 (83.33)	39 (33.05)		
Repeated infection				**0.0147**	**0.904**
Yes	41 (31.78)	4 (33.33)	37 (31.62)		
No	88 (68.22)	8 (66.67)	80 (68.38)		

Table 5 above shows that only the variable Meal frequency (p = **0.000**) is associated with acute malnutrition.

Table 5. Characteristics of the sample (n = 130) according to behavioural and environmental factors of children aged 6 - 59 months in the commune of Buhiga.

		Acute malnutrition			
Variable	***n* (%)**	**Yes**	**No**	**Chi²**	***p*-value**
Knowledge of the number of times breastfed per day				**0.2617**	**0.609**
Yes	113 (86.92)	11 (91.67)	102 (86.44)		
No	17 (13.08)	1 (8.33)	16 (13.56)		
Types of care facilities attended				**0.0025**	**0.960**
Known health facilities	106 (82.81)	10 (83.33)	96 (82.76)		

Continued

Use of community health workers	22 (17.19)	2 (16.67)	20 (17.24)		
Frequency of meals consumed				**49.8861**	**0.000**
1 meal per day	16 (12.31)	9 (75.00)	7 (5.93)		
2 meals a day	40 (30.77)	3 (25.00)	37 (31.36)		
3 meals a day	64 (49.23)	0 (0.00)	64 (54.24)		
4 meals a day	10 (7.69)	0 (0.00)	10 (8.47)		
Weaning age				**0.4279**	**0.807**
Before 6 months	11 (8.46)	1 (8.33)	10 (8.47)		
6 months	100 (76.92)	10 (83.33)	90 (76.27)		
After 6 months	19 (14.62)	1 (8.33)	18 (15.25)		
Compliance with the vaccination schedule				**0.0127**	**0.910**
Yes	118 (90.77)	11 (91.67)	107 (90.68)		
No	12 (9.23)	1 (8.33)	11 (9.32)		
Primary Household Decision Maker				**3.3051**	**0.192**
Husband and wife decide together	104 (80.00)	12 (100.00)	92 (77.97)		
The husband decides alone	13 (10.00)	0 (0.00)	13 (11.02)		
The woman decides alone	13 (10.00)	0 (0.00)	13 (11.02)		
Sources of income				**2.4145**	**0.491**
Agriculture	100 (76.92)	9 (75.00)	91 (77.12)		
Agriculture **and livestock** farming	18 (13.85)	3 (25.00)	15 (12.71)		
Civil servants' salaries	11 (8.46)	0 (0.00)	11 (9.32)		
Other	1 (0.77)	0 (0.00)	1 (0.85)		
Domestic violence				**0.3752**	**0.540**
Yes	31 (23.85)	2 (16.67)	29 (24.58)		
No	99 (76.15)	10 (83.33)	89 (75.42)		
Fitted latrine				**0.1438**	**0.705**
Yes	103 (79.23)	9 (75)	94 (79.66)		
No	27 (20.77)	3 (25)	24 (20.34)		
Compliance with Good Handwashing Practices				**2.5470**	**0.111**
Yes	21 (16.15)	0 (0.00)	21 (17.80)		
No	109 (83.85)	12 (100.00)	97 (82.20)		

3.2. Bivariate Analysis

In Tables 6-8 below, the variables significantly associated ($p < 0.05$) with acute malnutrition in children aged 6 to 59 months in the commune of Buhiga are: digestive disorders, compliance with the vaccination schedule, the father's level of

education, the mother's level of education, the age of the child, the adapted latrine system, domestic violence, marital status, household size and frequency of meals eaten.

Table 6. Analysis of the association between acute malnutrition and sociodemographic factors of children aged 6 to 59 months in Buhiga commune of Karusi province.

		Acute malnutrition				
Variable	***n* (%)**	**Yes**	**No**	**GOLD Raw**	**95% CI**	***p*-value**
Marital Status						
Bachelor	1 (0.77)	0 (0)	1 (0.85)	-	-	-
Married	118 (90.77)	9 (75.00)	109 (92.37)	**1 (Ref)**		
Divorced	1 (0.77)	0 (0)	1 (0.85)	-	-	-
Cohabitation	5 (3.85)	2 (16.67)	3 (2.54)	**8.07**	[1.1; 54.7]	**0.032**
Widower	5 (3.85)	1 (8.33)	4 (3.39)	**3.02**	[0.30; 30]	**0.344**
Mother's level of education						
Without	37 (28.46)	8 (66.67)	29 (24.58)	**1 (Ref)**		
Primary	72 (55.38)	3 (25.00)	69 (58.47)	**0.15**	[0.03; 0.63]	**0.009**
Secondary	20 (15.38)	1 (8.33)	19 (16.1)	**0.19**	[0.02; 1.65]	**0.132**
University	1 (0.77)	0	1 (0.85)	-	-	-
Father's level of education						
Without	22 (16.92)	10 (83.33)	12 (10.17)	1 (Ref)		
primary	94 (72.31)	2 (16.67)	92 (77.97)	0.02	[0.005; 0.13]	0.000
Secondary	14 (10.77)	0 (0.00)	14 (11.86)	-	-	-
History of the first birth						
<18 years old	9 (6.92)	7 (58.33)	2 (1.69)	1 (Ref)		
Between 18 and 30 years old	115 (88.46)	3 (25.00)	112 (94.92)	0.007	[0.001; 0.05]	0.432
30 years and older	6 (4.62)	2 (16.67)	4 (3.39)	0.142	[0.01; 1.4]	0.675
Sex of the child						
Boy	71 (54.62)	6 (50.00)	65 (55.08)	1 (Ref)		
Daughter	59 (45.38)	6 (50.00)	53 (44.92)	1.22	[0.37; 4.02]	0.736
Age of the child						
Between 6 and 12 months	31 (23.85)	7 (58.33)	24 (20.34)	1 (Ref)		
12 and 36 months	18 (13.85)	2 (16.67)	16 (13.56)	0.42	[0.07; 2.3]	0.327
37 and 59 months	81 (62.31)	3 (25.00)	78 (66.10)	0.13	[0.03; 0.54]	0.005

Continued

Reproductive interval respected						
No	41 (31.54)	10 (83.33)	31 (26.27)	1 (Ref)		
Yes	89 (68.46)	2 (16.67)	87 (73.73)	0.0712	[0.014; 0.34]	0.322
Household size						
1 - 2	0 (0.00)	0 (0.00)	0 (0.00)	-	-	-
3 - 7	95 (73.08)	2 (16.67)	93 (78.81)	1 (Ref)		
Over, from 7	35 (26.92)	10 (83.33)	25 (21.19)	18.6	[3.8; 90.4]	0.000
Religion						
Catholic	90 (69.23)	7 (58.33)	83 (70.34)	1 (Ref)		
Protestant	22 (16.92)	3 (25.00)	19 (16.10)	1.87	[0.44; 7.9]	0.394
Anglican	5 (3.85)	1 (8.33)	4 (3.39)	-	-	-
Muslim	4 (3.08)	0 (0.00)	4 (3.39)	2.96	[0.29; 30.2]	0.359
Other	9 (6.92)	1 (8.33)	8 (6.78)	1.48	[0.16; 13.6]	0.728
Birth order						
First child	19 (14.62)	2 (16.67)	17 (14.41)	1 (Ref)		
Other Rank	111 (85.38)	10 (83.33)	101 (85.59)	**0.84**	[0.16; 4.1]	0.833

Table 7. Analysis of the association between acute malnutrition and morbidity factors in children aged 6 to 59 months in Buhiga commune of Karusi province.

		Acute malnutrition				
Variable	***n* (%)**	**Yes**	**No**	**GOLD Raw**	**95% CI**	***p*-value**
Digestive disorders						
Yes	79 (60.77)	3 (25.00)	76 (64.41)	1.18	[1.39; 21.14]	0.01
No	51 (39.23)	9 (75.00)	42 (35.59)	1		
Access to treatment						
Yes	96 (73.85)	10 (83.33)	86 (72.88)	1.86	[0.38; 8.95]	0.43
No	34 (26.15)	2 (16.67)	32 (27.12)	1		
Episode of diarrhea						
Yes	88 (68.22)	8 (66.67)	80 (68.38)	0.93	[0.3; 3.81]	0.90
No	41 (31.78)	4 (33.33)	37 (31.62)	1		
Presence of feverish peak						
Yes	82 (63.08)	8 (66.67)	74 (62.71)	0.84	[0.23; 2.95]	0.78
No	48 (36.92)	4 (33.33)	44 (37.29)	1		
Presence of chronic disease						
Yes	122 (93.85)	12 (100.00)	110 (93.22)	-	-	-

Continued

No	8 (6.15)	0 (0.00)	8 (6.78)	1		
Repeated pludism						
Yes	81 (62.31)	2 (16.67)	79 (66.95)	10.1	[2.1; 48]	0.224
No	49 (37.69)	10 (83.33)	39 (33.05)	1		
Repeated infection						
Yes	41 (31.78)	4 (33.33)	37 (31.62)	0.92	[0.26; 3.26]	0.904
No	88 (68.22)	8 (66.67)	80 (68.38)	1		

Table 8. Analysis of the association between acute malnutrition and behavioural and environmental factors.

		Acute malnutrition				
Variable	***n* (%)**	**Yes**	**No**	**GOLD Raw**	**95% CI**	***p*-value**
Knowledge of the number of times breastfed						
Yes	113 (86.92)	11 (91.67)	102 (86.44)	0.57	[0.06; 4.79]	0.613
No	17 (13.08)	1 (8.33)	16 (13.56)	1		
Types of care facilities attended						
Known health facilities	106 (82.81)	10 (83.33)	96 (82.76)	1		
Use of community health workers	22 (17.19)	2 (16.67)	20 (17.24)	0.96	[0.19; 4.72]	0.960
Frequency of meals consumed						
1 meal per day	16 (12.31)	9 (75.00)	7 (5.93)	1		
2 meals a day	40 (30.77)	3 (25.00)	37 (31.36)	0.06	[0.01; 0.29]	0.000
3 meals a day	64 (49.23)	0 (0.00)	64 (54.24)	-	-	-
4 meals a day	10 (7.69)	0 (0.00)	10 (8.47)	-	-	-
Weaning age						
Before 6 months	11 (8.46)	1 (8.33)	10 (8.47)	**1**		
6 months	100 (76.92)	10 (83.33)	90 (76.27)	1.11	[0.12; 9.60]	0.924
After 6 months	19 (14.62)	1 (8.33)	18 (15.25)	0.55	[0.03; 9.87]	0.689
Compliance with the vaccination schedule						
Yes	14 (10.94)	8 (66.67)	6 (5.17)	0.027	[0.006; 0.11]	0.000
Name	114 (89.06)	4 (33.33)	110 (94.83)	1		
Primary Household Decision Maker						
Husband and wife decide together	104 (80.00)	12 (100.00)	92 (77.97)	1		

Continued

The husband decides alone	13 (10.00)	0 (0.00)	13 (11.02)	-	-	-
The woman decides alone	13 (10.00)	0 (0.00)	13 (11.02)	-	-	-
Sources of income						
Agriculture	100 (76.92)	9 (75.00)	91 (77.12)	1		
Agriculture **and livestock** farming	18 (13.85)	3 (25.00)	15 (12.71)	2.02	[0.49; 8.33]	0.330
Civil servants' salaries	11 (8.46)	0 (0.00)	11 (9.32)	-	-	-
Other	1 (0.77)	0 (0.00)	1 (0.85)	-	-	-
Domestic violence						
Yes	87 (66.92)	5 (41.67)	82 (69.49)	3.18	[0.9; 10]	0.061
No	43 (33.08)	7 (58.33)	36 (30.51)	**1**		
Fitted latrine						
Yes	17 (13.08)	10 (83.33)	7 (5.93)	0.01	[0.002; 0.06]	0.000
No	113 (86.92)	2 (16.67)	111 (94.07)	**1**		
Compliance with Good Handwashing Practices						
Yes	21 (16.15)	0 (0.00)	21 (17.80)	**-**	**-**	**-**
Name	109 (83.85)	12 (100.00)	97 (82.20)	**1**		

Indeed

- Children whose mothers are in common-law unions are 8.07 times more likely to develop acute malnutrition compared to children whose mothers have partners and are legally married.
- Children whose mothers have at least a primary level of education are 85% less likely to develop acute malnutrition compared to children whose mothers' level of education is not.
- Children whose fathers have at least a primary level of education are 98% less likely to develop acute malnutrition compared to children whose fathers' level of education is not.
- Children aged between 37 and 59 months have an 87% lower risk of developing acute malnutrition compared to children aged between 6 and 12 months.
- Children whose households have more than 7 members are 18.6 times more likely to develop acute malnutrition compared to children whose household members are between 1 and 2.
- Children with digestive disorders are 5.42 times more likely to be attacked by acute malnutrition compared to children without digestive disorders.
- Children who eat two meals a day are 94% less likely to develop acute malnutrition compared to children who eat one meal a day.
- Children who have adhered to the immunization schedule are 99% less likely

to develop acute malnutrition compared to children who do not adhere to the immunization schedule.

- Children whose parents argue are 3.18 times more likely to develop acute malnutrition compared to children whose families are calm.
- Children who belong to households with well-equipped latrines are less likely to develop acute malnutrition compared to children whose household latrines are in poor condition.

3.3. Multivariate Analysis

The following Table 9 shows the explanatory variables retained in a multivariate logistic regression model as significantly associated with acute malnutrition in the Buhiga commune.

All independent variables tested that had a significant influence on the rate of acute malnutrition in the bivariate analysis with a $p < 5\%$ (Marital status of the mother in a common-law union, mother's level of education, father's level of education, age of the child, household size, digestive disorders, frequency of meals consumed, adherence to the vaccination schedule, modified latrine) were taken and their association with the dependent variable (global acute malnutrition) was tested and eliminated confounding factors with p value > 5% (Mother's level of education, father's level of education, child's age, digestive disorders, adherence to the vaccination schedule, adapted latrine) and remained with the variables significantly associated with acute malnutrition in children aged 6 - 59 months in the Buhiga commune of the Karusi Province with a $p < 5\%$ (frequency of meals consumed, household size, marital status of the mother in common-law union) which constitute the determinants of acute malnutrition in children aged 6 - 59 months in the Buhiga commune of the Karusi Province.

Table 9. Analysis of the association between acute malnutrition and the factors influencing it among children aged 6 to 59 months in the commune of Buhiga.

		Acute malnutrition				
Variable	***n* (%)**	**Yes**	**No**	**Adjusted GOLD**	**95% CI**	***p*-value**
Digestive disorders						
Yes	79 (60.77)	3 (25.00)	76 (64.41)	0.86	[0.029; 25]	0.935
No	51 (39.23)	9 (75.00)	42 (35.59)	1 (Ref)		
Compliance with the vaccination schedule						
Yes	14 (10.94)	8 (66.67)	6 (5.17)	0.21	[0.001; 41]	0.570
Name	114 (89.06)	4 (33.33)	110 (94.83)	1 (Ref)		
Father's level of education						
Without	22 (16.92)	10 (83.33)	12 (10.17)	1 (Ref)		
Primary	94 (72.31)	2 (16.67)	92 (77.97)	0.27	[0.017; 4.55]	0.371

Continued

Secondary	14 (10.77)	0 (0.00)	14 (11.86)	-	-	-
			Acute malnutrition			
Variable	**n (%)**	**Yes**	**No**	**Adjusted GOLD**	**95% CI**	***p*-value**
Age of the child						
Between 6 and 12 months	31 (23.85)	7 (58.33)	24 (20.34)	1 (Ref)		
12 and 36 months	18 (13.85)	2 (16.67)	16 (13.56)	0.091	[0.0; 12]	0.339
37 and 59 months	81 (62.31)	3 (25.00)	78 (66.10)	0.05	[0.001; 2]	0.115
Well-appointed latrine						
Yes	17 (13.08)	10 (83.33)	7 (5.93)	0.038	[0.001; 1.15]	0.061
No	113 (86.92)	2 (16.67)	111 (94.07)	1 (Ref)		
Marital Status						
Bachelor	1 (0.77)	0 (0)	1 (0.85)	-	-	-
Married	118 (90.77)	9 (75.00)	109 (92.37)	1 (Ref)		
Divorced	1 (0.77)	0 (0)	1 (0.85)	-	-	-
Cohabitation	5 (3.85)	2 (16.67)	3 (2.54)	**34.9**	[1.111; 1092]	**0.043**
Widower	5 (3.85)	1 (8.33)	4 (3.39)	3.07	[0.002; 3779]	0.757
Mother's level of education						
Without	37 (28.46)	8 (66.67)	29 (24.58)	1 (Ref)		
Primary	72 (55.38)	3 (25.00)	69 (58.47)	0.18	[0.02; 1.41]	0.104
Secondary	20 (15.38)	1 (8.33)	19 (16,1)	0.09	[0.004; 1.9]	0.126
University	1 (0.77)	0	1 (0.85)	-	-	-
Household size						
3 - 7	95 (73.08)	2 (16.67)	93 (78.81)	1 (Ref)		
More than 7	35 (26.92)	10 (83.33)	25 (21.19)	**10.4**	[1.72; 64]	**0.011**
			Acute malnutrition			
Variable	**n (%)**	**Yes**	**No**	**Adjusted GOLD**	**95% CI**	***p*-value**
Frequency of meals consumed						
1 meal per day	16 (12.31)	9 (75.00)	7 (5.93)	1 (Ref)		
2 meals a day	40 (30.77)	3 (25.00)	37 (31.36)	**0.12**	[0.02; 0.69]	**0.017**
3 meals a day	64 (49.23)	0 (0.00)	64 (54.24)	-	-	-
4 meals a day	10 (7.69)	0 (0.00)	10 (8.47)	-	-	-

At the end of the analysis, logistic regression eliminated confounding factors.

Variables with a significant p-value (<5%) and those with a p-value of less than 20% were integrated into the initial model with top-down elimination of variables with $p > 0.05$.

Thus, the variables with $p < 0.05$ at this stage are then significantly associated with acute malnutrition in children aged 6 to 59 months in the commune Buhiga and therefore constitute the determinants of acute malnutrition in children aged 6 - 59 months in the commune Buhiga, and it is the frequency of meals consumed ($p = 0.017$), household size ($p = 0.011$) and marital status ($p = 0.043$).

3.4. Statistical Analysis

During our study, 3 types of data analysis were performed:

- **Univariate analysis**: This was a descriptive analysis of the independent variables in our sample: Descriptive analysis of socio-demographic factors, descriptive analysis of factors related to child morbidity, and descriptive analysis of behavioural and environmental factors.
- **Bivariate analysis**: Each independent variable was cross-referenced with the dependent variable to see the factors (independent variables) that influenced the dependent variable.
- **Multivariate analysis**: All independent variables tested that had a significant influence on the rate of acute malnutrition in the bivariate analysis with a p value < 5% (Marital status of the mother in a common-law union, Mother's level of education, father's level of education, Age of the child, household size, digestive disorders, frequency of meals consumed, adherence to the vaccination schedule, adapted latrine) were taken and their association with the dependent variable (global acute malnutrition) was tested and eliminated confounding factors with p value > 5% (mother's level of education, father's level of education, age of the child, digestive disorders, adherence to the vaccination schedule, adapted latrine) and remained with the variables significantly associated with acute malnutrition in children aged 6 - 59 months in the Buhiga commune of Karusi Province with a p value < 5% (frequency of meals consumed, household size, marital status of the mother in common-law union) which constitute the determinants of acute malnutrition in children aged 6 - 59 months in Buhiga commune of Karusi Province.

A database was built using Excel 2016 and the data was exported to STATA 15.1 for analysis. After the data was entered, the data was pre-processed to assess the quality of the information entered, including checking the normality of the data. If quantitative data were missing, they were replaced by the mean or median for variables with a normal and abnormal distribution, respectively. For qualitative data, they have been replaced by a frequent modality. Outliers were also corrected prior to the actual analysis.

Subsequently, the data analysis was carried out as follows:

- For univariate (descriptive) analysis, the following measures were calculated: proportion for qualitative variables, mean and standard deviation for quanti-

tative variables following a normal distribution; median and interquartile range for quantitative variables that do not follow a normal distribution.

- In bivariate analysis, each independent variable was cross-referenced with the dependent variable. The exact Fisher test was used to test the significance of associations when at least one of the theoretical values was less than 5%, elsewhere the chi^2 test was used. The odds ratio, p-value and 95% confidence interval were also calculated to test the statistical significance, meaning and strength of the associations of the observed differences between the proportions of the different modalities with respect to the dependent variable.
- Multivariate analysis: Logistic regression was applied and eliminated confounding factors. Variables with a significant p-value (<5%) and those with a p-value of less than 20% were integrated into the initial model with top-down elimination of variables with $p > 0.05$.
- After modelling, the best model with a low CSA was selected as containing variables considered to be factors influencing the occurrence of acute malnutrition in children aged 6 to 59 months in the commune of Buhiga. Only variables of which $p < 0.05$, at this stage, have been taken as the determinants of acute malnutrition.
- Finally, a ROC curve was used to discriminate between children aged 6 to 59 months with acute malnutrition and those without acute malnutrition.

At the end of the analysis, the variables significantly associated ($p < 0.05$) with acute malnutrition among children aged 6 to 59 months in the commune of Buhiga were the frequency of meals consumed, household size and marital status (Figure 4).

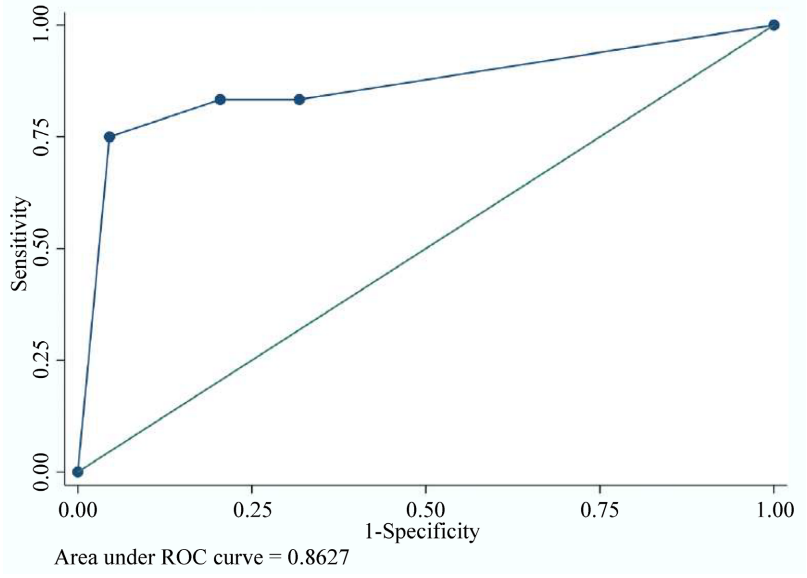

Figure 4. ROC curve.

The graph above shows the ROC curve obtained from the results of the final model. The area under the ROC curve is 0.8627. The model's ability to correctly

classify observations is 86.2%. We can conclude that this model has predictive power, with very good discrimination.

4. Discussion of the Results

The objective of our study was to contribute to the identification of the determinants of acute malnutrition in children aged 6 to 59 months in the Buhiga commune of the Karusi Province in Burundi.

In our study, the prevalence of malnutrition in children aged 6 - 59 months is 9.23%. This prevalence is higher than the national prevalence obtained in the SMART 2022 survey, which is 6.4%.

It is much lower than that found in Libela Town (Yalew, 2014) which is 30.9%, lower than that found in Cameroon which is 26.8% ($p = 0.000$) (Tchuente et al., 2024), Close to that found in Ethiopia 14.89% (95% CI, $p = 13.9 - 15.9$) (Daniel et al., 2019), too close to that found in GASOGWE which is 7.3% (Favina, 2024).

In this study, 3 factors were recognized as predictors of acute malnutrition in children aged 6 to 59 months in the commune of Buhiga: The frequency of meals consumed ($p = 0.017$), the size of the household ($p = 0.011$) and the marital status ($p = 0.043$).

In our study, marital status was identified as a factor associated with acute malnutrition. The results show that children born to common-law mothers are 34.9% more likely to develop acute malnutrition than those born to married mothers.

In addition, meal frequency has also been found to be associated with acute malnutrition. The results of the study show that children who eat two meals a day are 88% less likely to develop acute malnutrition compared to children who eat one meal a day.

Finally, household size has also been identified as a factor associated with acute malnutrition. The more people there are to feed, the more difficult it can be to provide enough food for everyone. The results show that children who are raised in a multiple family with a high sibling group (>7 members) are 10.4% more likely to develop acute malnutrition than those raised in a smaller family with few people (between 3 and 7).

These findings are consistent with previous research on acute malnutrition. For example, a study conducted in several developing countries showed that lack of access to adequate food was a significant risk factor for acute malnutrition (Ivers & Neufeld, 2017). Another study showed that marital status (common-law union) is a significant risk factor for malnutrition in children aged 6 - 59 months (Olivier et al., 2018).

In addition, other studies have highlighted the importance of meal frequency in preventing acute malnutrition in children.

In addition, a study conducted in Niger showed that household size was an important factor in acute malnutrition among children (Alisha et al., 2017).

Finally, this study highlights several factors associated with acute malnutrition, including marital status, frequency of meals, and household size. These findings

are consistent with previous research on acute malnutrition and highlight the importance of considering these factors when developing nutrition programs to better target those at risk and implement effective interventions.

5. Conclusion

The issues of health in general and nutrition in particular are nowadays inseparable from the global choices made within the framework of the development programs initiated and implemented by international organizations and public authorities in sub-Saharan Africa. These issues are mainly based on improving the quality of life of the population. A healthy population in adulthood necessarily requires better nutrition in childhood.

Most previous studies have shown the impact of a number of factors that combine to act on nutritional status. Prevention and awareness-raising actions in communities are hampered by a context marked by poverty, problems of poor health, hygiene and sanitation coverage and low literacy rates in rural areas.

In view of the above, the objective of this study is to research the determinants of malnutrition among children aged 6 to 59 months in Buhiga commune of the Karusi Province.

1) To show the prevalence of acute malnutrition among children aged 6 to 59 months in the commune of Buhiga.

2) To analyze the link between sociodemographic factors, factors related to child morbidity, behavioral and environmental factors and the occurrence of acute malnutrition in children aged 6 to 59 months in the commune of Buhiga.

3) Identify the factors associated with acute malnutrition in children aged 6 to 59 months in the Buhiga commune.

4) Propose exit routes to fight against acute malnutrition among children aged 6 to 59 months in the commune of Buhiga.

The frequency of meals consumed per day, household size and marital status (common-law union) are the predictive factors of malnutrition among children aged 6 - 59 months in the Buhiga commune of the province of Karusi.

Most malnourished children are born to young mothers in common-law unions who do not have stable partners and are therefore unable to contribute to their daily household expenses or to support themselves in relation to feeding their children. The quality and frequency of food consumed per day is a crucial problem, as the diet is not varied and often insufficient due to the overcrowding of people to feed in the household. The affordability of food products also remains a concern. It is linked to high production costs vis-à-vis a population whose purchasing power is increasingly eroded over time. In rural areas in particular, it is recognized that poverty has a direct influence on food insecurity and in turn on the nutritional status of the youngest.

6. Suggestions

The prevalence of malnutrition is still a concern that requires a continuous and

large-scale mobilization of the State and its partners, who must consequently adopt new strategies to better manage the nutritional situation of children.

We suggest the following recommendations:

At the political and programmatic level:

- Every health facility throughout the country should be equipped with a service that provides nutritional assistance.
- Strengthen nutrition education in formal primary education and develop a policy to ensure that girls have at least one level of education that would improve the nutritional status of children in the long term.
- In the implementation of IEC activities, improve household nutrition behaviours. To promote education for the health of families on the nutritional value of food and on a balanced diet of sufficient quality and quantity.
- Improve the geographical coverage of poverty reduction actions and strengthen activities in rural areas. Promote income-generating activities in families so that they can have enough to eat by grouping them in associations and granting them collective credits.
- Provide additional meals per day for children under 5 years of age in families (more than 3 meals per day) if possible.
- Promote family planning.
- Integrate sexual health sex education sessions for young people into health care settings.
- Advise free women with multiple sexual partners to always practice safe sex.
- Educate girls of childbearing age on the need for sexual abstinence before marriage in order to avoid unwanted pregnancies.

At the scientific level:

Promote biodemographic research based on child growth aimed at establishing a standard for measuring the nutritional status of children in each health care setting.

This reference will make it possible to take into account purely national specificities in the construction of anthropometric indicators for future studies on child malnutrition.

It would be interesting for future studies to collect information on the duration of breastfeeding, the birth interval, the use of health centres (prenatal visits by the mother for all births under five years of age), and the birth order of the child.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

Alisha, C. J., Matthew, P. R., Christian, A. G., & Anita, S. (2017). Household Food Security in the United States. *Economic Research Service, 256*, 6-22.

Daniel, G. B., Dagmawi, C., Adugnaw, Z. A., Fantu, M. A., & Melaku, H. A. (2019). Spatial Distribution and Associated Factors of Severe Malnutrition among under Five Children in Ethiopian. *Open Access, 23,* 5-7.

Favina, A. (2024). *Determinants of Malnutrition among Children Aged 6-59 Months in the*

GASOGWE-KINAMA Refugee Camp in the North of the Country. Master's Thesis, Burundi Knowledge Attic.

Ivers, L., & Neufeld, L. M. (2017). Food Insecurity and the Risk of Poor Health Outcomes in Children and Adolescents. *American Journal of Preventive Medicine, 29,* 643-649.

Minisante (2007). *Nutritional Monitoring System*; *Baseline Survey for the Implementation of the System*. Final Report, Ministry of Public Health and the Fight against AIDS, Bujumbura, Burundi.

Minisante (2010). *Protocol National Integrated Management of Acute Malnutrition*. Ministry of Public Health and the Fight against AIDS, Department of Health Services and Programmes (PRONIANUT), Bujumbura, Burundi.

Minisante (2011). *Medium-Term Expenditure Framework*. Ministry of Public Health and the Fight against AIDS, Bujumbura, Burundi.

Minisante (2012). *National Protocol for Integrated Management of Global Acute Malnutrition in Burundi.* Ministry of Public Health and the Fight against AIDS, Department of Health Services and Programs, National Integrated Food and Nutrition Program, Bujumbura, Burundi.

Olivier, M., Augustin, M. M., Lewis, K. K., Toni, K. L., Paul, M. M., Michel, N. A., Stanislas, O. W. & Oscar, N. L. (2018). Development of a Predictive Score for Severe Acute Malnutrition in Children under 5 Years of Age. *The Pan African Medical Journal, 29,* 2-4.

Schwartz, D. (1969). *Statistical Methods for the Use of Physicians and Biologists* (3rd ed.). Flammarion.

Tchuente, B. R. T., Nguedjo, M. W., Ngoumen, D. J. N., De Wandji, G. C. F., Tene Mouafo, H., Tambe, B. A. et al. (2024). Prevalence and Associated Factors of Coexisting Forms of Malnutrition in Children under 5 Years Age in a Rural Area of Cameroon. *PLOS ONE, 19,* e0303611. https://doi.org/10.1371/journal.pone.0303611

WHO (2008). *The Management of Severe Malnutrition*. Handbook for Physicians and Other Health Personnel in Management Positions, World Health Organization.

Yalew, B. M. (2014). Prevalence of Malnutrition and Associated Factors among Children Age 6-59 Months at Lalibela Town Administration, North WolloZone, Anrs, Northern Ethiopia. *Journal of Nutritional Disorders & Therapy, 4,* 2-4. https://doi.org/10.4172/2161-0509.1000132

York House (2024). *Lesson Explainer: Stratified Random Sampling*. https://www.nagwa.com/en/eg/