

# Undernutrition among HIV-positive Children of age 1-5 Years attending the ART Clinic in Bushenyi Health Centre IV Ishaka-Bushenyi Municipality, Bushenyi District

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## ABSTRACT

Worldwide, more than 3.4 million children under the age of 5 are infected with HIV. Both acute and chronic malnutrition are major problems for HIV-positive children living in resource-limited settings. In Uganda, the data from ART clinics revealed that up to 23% of mothers and 50% of children who were on treatment have moderate acute malnutrition. To understand undernutrition in HIV-positive children aged 1–5 years in Bushenyi District, western Uganda, a study was conducted in Bushenyi Health Centre IV to determine the common forms of undernutrition, mother awareness of undernutrition, and the management protocol conferred on HIV-positive children. There were 61 participants, of whom 54% were female and 46% were male; 41% were between the ages of 1–2 years; 31% were 5 years; and 28% were 3–4 years. The study indicated that 82% of the guardians had good knowledge about undernutrition, with 18% having little knowledge of the problem in HIV-positive children. In this study, using the z-score in data analysis, there were 3 children who were less than -2 SD (-2 standard deviation), and the overall prevalence of undernutrition was 5%. The guardians were asked whether they had heard about Ready-to-Use Therapeutic Food (RUTF) in the hospital management of undernutrition in HIV-positive children, and 79% of the respondents confirmed that they had heard about it and that they preferred their undernourished children to be managed with that form from the health units. However, 21% preferred managing their children from home without getting to the health unit. The prevalence of undernutrition in HIV-affected children aged 1–5 years is high, and the majority of the children are underweight with moderate acute malnutrition. Some HIV-positive caretakers still have inadequate knowledge about undernutrition in their children. Some people lack knowledge about the management of undernutrition in HIV-positive children.

**Keywords:** HIV, ART, Malnutrition, Undernutrition

## INTRODUCTION

Infection with the human immunodeficiency virus (HIV) is one of the greatest challenges to global health faced by the medical profession [1–3]. There are 3.4 million HIV-positive children below 5 years of age and 340,000–450,000 new infections in the pediatric population each year [4]. HIV infection is particularly aggressive in children without access to treatment; more than half of HIV-infected infants die before the age of 2 years. The HIV pandemic has affected the nutritional status and mortality of children in Africa and many developing countries [5–7]. Both undernutrition and HIV have effects on the immune system, and their clinical presentations overlap with many similarities [4]. The commonest form of undernutrition is severe acute malnutrition (SAM). HIV sero-prevalence in severely malnourished Ghanaian children is 27.2% out of the 29.2% worldwide. This means that in such a country, a child with SAM who has three or more of the

following clinical features: severe muscle wasting, prolonged fever, cough and diarrhea, oral thrush, and generalized lymphadenopathy, is strongly suspected to be HIV seropositive [8]. Chinkhumba et al. [9] reported that HIV-infected children were more likely to have lower hemoglobin levels. Survival has improved dramatically; however, challenges remain. In countries with a relatively low HIV prevalence, health workers may not have enough suspicion of HIV infection to request provider-initiated HIV testing and counseling (PITC) in appropriate settings. The child's clinical symptomatology may be wrongly attributed to the SAM. HIV-seropositive children may die before they are diagnosed or before they can access ART. But the clinical algorithm for the presumed diagnosis of HIV has its limitations. Nevertheless, it could be useful in resource-limited settings (RLS) where facilities for testing may be lacking or in short supply. The utility of such clinical

algorithms has been recognized, and their use is encouraged in the absence of appropriate laboratory tests [8]. Current World Health Organization (WHO) guidelines (2012) recommend provider-initiated HIV testing and counseling (PITC) in clinical settings for all children in countries with an HIV prevalence of 1% in the general population [10]. PITC has been shown to be acceptable and effective in these settings [11]. Despite these recommendations, Baggaley et al. [12] found that only 9.5% of inpatients (adults or children) were offered PITC by countries that have adopted the WHO PITC policy. Inadequate testing for HIV infection is the major reason why less than one-quarter of children eligible for treatment are accessing antiretroviral therapy [4]. Early identification of HIV infection will aid in reducing morbidity and mortality in both children and their families. In Uganda, despite sustained economic growth and poverty reduction, the proportion of the population that is food insecure increased from 19 percent in 1992 to 21 percent in 2007. Food and nutrition security remain the fundamental challenge to human welfare and economic growth, with almost 30 percent of households considering food insecurity and chronic undernutrition in HIV-infected children a critical issue. One-third of children under five years old are stunted. Undernutrition is an underlying cause of 60 percent of deaths for HIV-positive children under five. Micronutrient deficiencies, including vitamin A and iron, are highly prevalent in women and children [13–16]. The causes of undernutrition vary by region, including lack of enough and access to food, lack of dietary diversity, cultural and social traditions, and poverty levels. Producing more staple food does not guarantee improved nutrition, as seen in the southwest region, considered the “food basket” of Uganda, which has one of the highest prevalence rates of stunting in children under five. Similarly, increasing income does not guarantee improved nutrition. Anaemia, vitamin A deficiency, and wasting in children are independent of wealth and affect all economic groups. Undernutrition disproportionately affects rural areas, where rates of stunting are over 36 percent compared to 19 percent in urban areas [17]. The strong relationship between HIV infection and nutrition has been observed and reported in settings within the country. For instance, the data from ART clinics reveals that up to 23% of mothers and 50% of children who were on treatment have moderate acute malnutrition. On the other hand, in 2007, the

Mwanamugimu Nutrition Clinic in Mulago reported that 40% of the children who were admitted with malnutrition were found to be infected with HIV. HIV-infected mothers who initiate breast feeding should have access to safe, nutritious complementary feeds after six months. This is because their capacity to breastfeed is often compromised by their own impaired nutritional status, right from the time they were pregnant until after delivery. On the other hand, HIV-infected children experience slower growth and are particularly at risk of undernutrition, whereas the SAM in infected children is capable of reversal with appropriate therapeutic feeding. Studies reveal that recovery tends to take longer than among uninfected children. Currently, 33% of Ugandan children less than five years of age are stunted, 16% are underweight, and 4% are wasted. Other forms of undernutrition do exist, and with HIV infection, they become aggravated [18–25]. HIV and undernutrition effects are interconnected, worsen one another in a cycle, and can have progressive damage to the immune system independently. HIV specifically affects nutritional status by reducing food intake, increasing energy requirements, and harmfully affecting nutrient absorption and metabolism [26–32]. On the other hand, antiretroviral therapy (ART) medications can cause nausea, vomiting, loss of appetite, diarrhea, and other disorders. Diarrhoea adversely affects the nutritional status of people living with HIV (PLWHIV) [33–37]. Undernutrition in Uganda affects over 2 million children under 5 years of age and below. Stunting (or chronic undernutrition, measured as “height-for-age”), which occurs when a child fails to grow to the expected height or length compared to a healthy child of the same age, remains a major public health problem in Uganda. Approximately 39% of children under 5 years old are stunted, and more than a third of them are severely malnourished (based on the WHO Growth Standards). With an estimated population of 34.1 million, of which 19% are children under five, it can be estimated that 1.5% of the children are at increased risk of death due to severe acute malnutrition (SAM), and 4.7% of the children suffer from either severe or moderate acute malnutrition (MAM), with Bushenyi having the biggest number [21]. Therefore, based on the above background, the researcher intends to carry out a study in order to find out the possible causes of undernutrition in HIV-infected children in Ishaka-bushenyi municipality, Bushenyi District.

## METHODOLOGY

### Study Design

The study was cross-sectional and health center-

based.

### Study Area

Bushenyi District Health Centre IV is located 64 miles alongside Mbarara-kasese Road in Bushenyi town, and Bushenyi District is a district in western Uganda. It is bordered by Rubirizi District to the northwest, Buhweju District to the northeast, Sheema District to the east, Mitooma District to the south, and Rukungiri District to the west. The health center receives clients from neighboring towns and villages like Ishaka, Kashenyi, and Sheema, etc. It has

administration offices, an outpatient department, an accident and emergency ward, a surgical ward, a medical ward, a laboratory, a pediatric ward, a dental department, an ART clinic, etc. The study area was chosen by the researcher because of its easy geographical accessibility and the turnover of patient services offered, which include antenatal care, pediatrics, accident and emergency care, nutrition and ART clinics, etc.

### Study Population

These were malnourished children between the ages of 1 and 5 years attending the ART clinic of Bushenyi Health Centre IV from April to July 2017. The population in the study comprised health records

acquired from Bushenyi Health Center IV of children diagnosed with malnutrition and HIV under the age of 1 to 5 years from Bushenyi district.

### Sample Size Determination

This was calculated using the Fischer's et al. [22] formula. i.e.  $N = Z^2PQ/D^2$ :

Where N is the desired sample size.

Z is the standard normal deviation taken as 1.96 at a confidence interval of 95%.

P is the proportion of the target population estimated to have desired characteristics (7%).

D is the degree of accuracy, which is 5%.

Q = (1-P), which is the population without the desired characteristics.

Therefore;

$N = 1.96^2 \times 0.07 (1-0.07) / (0.05)^2 = 100$  people.

### Sampling Method

Respondents were chosen using random selection without considering their level of education or social and economic status to avoid bias. Women are mostly

responsible for food preparation for the family and are caretakers of children.

### Inclusion Criteria

All children attending the ART clinic in Bushenyi Health Center IV, aged 1 to 5, whose mothers

consented to the study.

### Exclusion Criteria

Patients attending the ART clinic in Bushenyi Health Center IV aged 1 to 5 years that were critically ill and

those that had congenital abnormalities.

### Data Collection Method

Data was collected by using questionnaires through direct interaction with mothers and guardians of children attending the ART clinic in Bushenyi Health Centre IV. Where participants were requested to give

appropriate answers of choice to questions, key informants were equally made use of. The results were considered in the end.

### Data analysis and presentation methods

The acquired results were analyzed using WHO growth standards and eventually presented using

Microsoft Word.

### Ethical Considerations

An introductory letter from the school of Allied Health Sciences and Public Health was obtained before embarking on the research. And this letter was

signed by the in-charge Bushenyi Health Centre after data collection. And a copy was left at the health center.

**RESULTS****SOCIO-DEMOGRAPHIC CHARACTERISTICS**

There were 61 participants of which 54% were female and 46% were males, 41% between the age of 1-2 years, 31% being 3-4 years and 28% 5 years. It was also shown that the highest level of education was a secondary level (44%) followed by primary level (33%),

tertiary level (13%) and informal education being 10%. Most guardians were peasants (62%), 30% housewives and 8% civil servants. Majority of the guardians were Banyankole (59%) followed by Bakiga (33%) and other tribes 8%. As shown in Table 1 below.

**Table 1: summary of socio demographic data Variables**

Child's Age (years)	Frequency (61)	Percentages (100%)
1-2	25	41
3-4	17	28
5	19	31
<b>Child's gender (sex)</b>		
Males	28	46
Females	33	54
<b>Guardians' education</b>		
Informal	6	10
Primary	20	33
Secondary	27	44
Tertiary	8	13
<b>Guardians' occupation</b>		
Peasants	38	62
Housewives	18	30
Civil servants	5	8
<b>Tribe</b>		
Banyankole	36	59
Bakiga	20	33
Others	5	8

**Common forms of Undernutrition in HIV infected children**

Table 2 shows that 95% of the children had a normal weight for Age according to the Uganda guidelines of Integrated Management for Acute malnutrition 2016,

which 32 were females, 26 were males and 5% were Underweight with 2 males and 1 female.

**Table 2: Weight for Age**

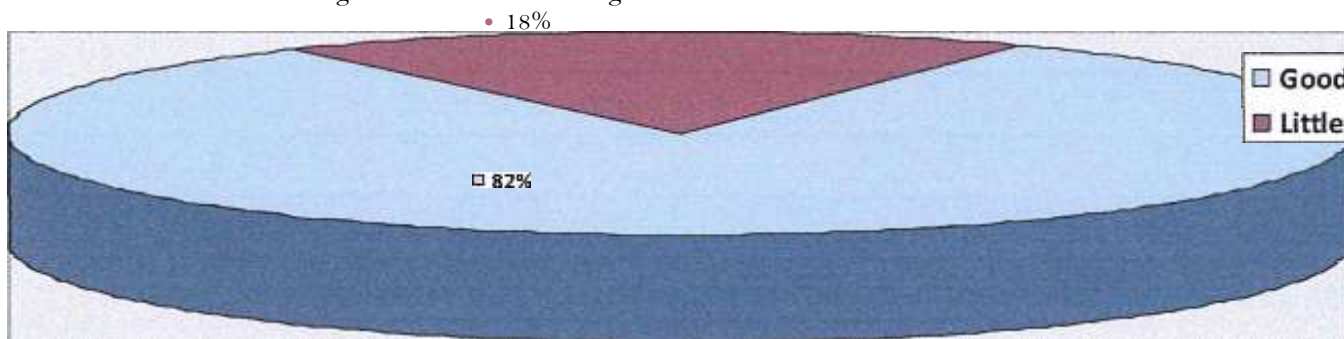
YEARS	Males and weights	Females and Weights	Percentages (100%)
1	11 normal	2 normal	21
2	9 normal	3 normal	20
3	1 normal	10 normal	18
4	5 normal	1 underweight	10
5	2 underweight	17 normal	31

**Guardians' awareness of Undernutrition**

In the study 82% of the guardians had good knowledge about Undernutrition and 18% had little knowledge

about Undernutrition in HIV infected children.

Figure 1: Pie chart showing Guardians awareness of Undernutrition



**Management protocol for Undernutrition in HIV positive children**

The table 3 below shows that majority of the respondents take their children to health units (79%) for management

of Undernutrition while 21% preferred home based management.

**Table 3: Shows management protocol for Undernutrition**

Management protocol	Frequency (61)	Percentages (100%)
From health units	48	79
Home based	13	21

## DISCUSSION

### Common forms of undernutrition

In this study using the z-score in data analysis, there were 3 children who were less than -2SD, and the overall prevalence of underweight was 5%. This is almost 3 times less than 16% of the underweight prevalence for children under 5 years living with HIV, as reported in the 2015 UDHS [14]. However,

the UDHS report for 2015 of 16% was a national report including HIV-infected children and non-infected children. This is due to the increased population in the region and the increased standards of living.

### Mothers' awareness of undernutrition

The study indicated that a large percentage of 82% of the respondents had good knowledge about undernutrition, i.e., signs, symptoms, and likely causes, with 18% having little knowledge, i.e., knew signs and symptoms but couldn't tell the likely causes.

The 18% little knowledge is less than the 54% ignorance reported by UDHS in 2016. This is because the UDHS 2016 report was for the whole western region, and my study was health center-based.

### The preferred management protocol for undernutrition in HIV-positive children

The guardians were asked whether they had heard about RUTF in the hospital management of undernutrition in HIV-positive children, and 79% of the respondents confirmed that they had heard about it and that they preferred their malnourished children to be managed with that form from the health units. However, 21% preferred managing their children from home without getting to the health unit; this

21% is less than the 72% of women and 80% of men who were willing to care for any family member with AIDS at home by buying fresh vegetables and increasing the diet of such members, as reported by the UDHS in 2011. This is due to the work that was done by the Millennium Development Goal to improve maternal and child health up to 2015.

## CONCLUSION

The prevalence of undernutrition in HIV-affected children aged 1–5 years is high, and the majority of the children are underweight with moderate acute malnutrition. Underweight can be considered as a measure to predict both acute and chronic

malnutrition in HIV-positive children. Some HIV-positive caregivers still have inadequate knowledge about undernutrition in their children. Some people lack knowledge about the management of undernutrition in HIV-positive children.

## RECOMMENDATION

1. More screening of undernutrition should routinely be performed to identify the risk group with different degrees of undernutrition so that proper interventions can be taken in the management by WHO regimens in order to reduce mortality due to undernutrition.
2. The government of Uganda should train and employ health workers so that mothers can acquire adequate knowledge about undernutrition in HIV-positive children.
3. The ministry of finance and economic planning should add more money to the operation of wealth creation programs to provide income activities to housewives in different homes.
4. Involving the community in health programs so that the local people can have a feeling of ownership and actively participate in health activities will increase the number of people attending health services.

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