

Prevalence and Determinants of Undernutrition Among Children Under Five Years at Hoima Regional Referral Hospital, Hoima District, Western Uganda

Kipruto Hosea

Faculty of Clinical Medicine and Dentistry Kampala International University Western Campus Uganda

ABSTRACT

This study aimed to determine the prevalence and factors causing undernutrition among children under five years old at Hoima Regional Referral Hospital. A cross-sectional descriptive study was conducted using quantitative and qualitative methods, focusing on children aged 3 to 59 months. Nutrition levels were determined using anthropometric measurements using US National Center for Health Statistics (NCHS) reference standards. The study involved systematic random sampling and data collection through questionnaires. Children with z-scores below -2 SD were considered undernourished. Stunting, wasting, and underweight were found to be 15%, 4%, and 8% respectively. The major determinants of nutrition among children under five years at the hospital were the child's age, birth interval, breastfeeding, maternal age, maternal education level, and maternal occupation. These factors directly or indirectly affected the child's nutrition status. The researcher recommends prioritizing health education for mothers about nutrition, exclusive breastfeeding, and family planning, and encouraging girl child education by the government. This research highlights the importance of addressing nutrition-related issues in children under five years old.

Keywords: Malnutrition, Global health problem, Children under five years, Caretakers, pediatric ward.

INTRODUCTION

Malnutrition generally refers to under nutrition and over nutrition. Under nutrition includes wasting, stunting, underweight and micronutrient deficiency whereas over nutrition includes obesity. Under nutrition is a major, global health problem. Children are particularly vulnerable since adequate nutrition is essential to ensure healthy growth and development. Globally 149.2 million children suffer from stunting and 45.4 million children are wasted among which 13.6 million are severely wasted [1]. Africa is severely affected and approximately 48 million children under five years are malnourished in Sub-Saharan Africa [2]. The majority of the countries in Africa are still struggling with the heavy burden of infectious diseases and poor maternal and child health. These countries need nutrition solutions that

are adapted to their circumstances, in order to achieve improved public health [3]. In Uganda, 2.3 million children under the age of five are chronically malnourished [4]. The World Health Organization (2013) estimated that there are 178 million children who are malnourished across the globe, and at any given moment, 20 million are suffering from the most severe form of malnutrition. Malnutrition contributes to between 3.5 and 5 million annual deaths among under-five children. UNICEF estimates that there are nearly 195 million children suffering from malnutrition across the globe. Most of the damage caused by under nutrition occurs in children in the first thousand days, the time when the quality of a child's diet has a profound impact on his or her physical and mental development. It has been

estimated by the global burden of disease study that under-five malnutrition alone has caused approximately half of the global loss of Disability Adjusted Life Years (DALYs) which is the sum of years of life lost from premature mortality years lived with disability adjusted for severity [5]. This consequently affects the intelligence level of children, their behaviour and school performance. Impaired mental development is taken as the most serious long-term handicap associated with under-five under nutrition. Malnutrition among under-five children is one of the most important public health problems in developing countries, especially in Sub-Saharan Africa [6] and about 35% of under-five deaths in the world are associated with under nutrition. Under nutrition continues to be a significant public health problem throughout low-income countries, particularly in Sub-Saharan Africa and South Asia [7]. In Uganda, under nutrition is a serious health and

welfare problem affecting the under-five children to whom it contributes significantly to mortality and morbidity. According to Uganda's demographic and health survey of 2016, 29% of children under five are stunted, 9% are severely stunted, 11% are underweight, 2% are severely underweight, 4% are wasted and 1% are severely wasted. In Uganda, 33% of children under five years are stunted while 4% are wasted with 1% being severely wasted according to the demographic and Health Survey [8] as cited by [9]. Under nutrition among children is an outcome of many interrelated factors including environment, economics, education, culture and food security. Among these, the ones that have immediate and direct effects on under nutrition are feeding practices and infections. Therefore, the nutrition levels of children can indicate the socio-economic development of a community which this study will illustrate.

METHODOLOGY

Study design

The study design was a cross-sectional descriptive study. It involved the use of quantitative and qualitative data collection methods. Survey questionnaires were administered to caretakers of paediatric patients at the paediatric ward and OPD of Hoima Regional Referral Hospital.

Area of Study

The study was carried out at Hoima Regional Referral Hospital in Hoima district. Hoima district is located in western Uganda 230 kilometers (km) northwest of Kampala the Capital city of Uganda. Hoima district is bordered by Buliisa District to the north, Masindi District to the northeast, Kyankwanzi in the east, Kibaale District to the south, Ntoroko District to the southwest and the Democratic Republic of Congo across Lake Albert to the west. Hoima Regional Referral Hospital is approximately 198 kilometres by road northwest of Mulago National Referral Hospital along Kijungu Road in Hoima district.

Study Population

The study population consisted of children less than five years old attending

Hoima Regional Referral Hospital.

Inclusion criteria

Only those caretakers who consented for their children to participate in the study were interviewed. All under-five-year-old children both male and female children whose caretakers consented were included in the study.

Exclusion criteria

- All caretakers who did not consent for their children to participate in the study were not interviewed.
- Children without caretakers were excluded.
- All babies less than 3 months were not included in the study.

sample size determination

This was determined using the formula according to Brown, (2004)

$$N = \frac{4p(1-p)}{e^2}$$

Where;

n = sample size

e = allowable error and in this case 10% (0.1) was taken 4 = is a constant derived from the formula.

P = prevalence of malnutrition in Uganda which is estimated at 43.5% (0.435).

Therefore;

$$N = \frac{4 \times 0.201(1-0.221)}{(0.08)^2}$$

$$N = \frac{(4 \times 0.201) \times 0.779}{0.0064}$$

$$N = 100$$

Sampling procedure

A simple random sampling method was used and 100 people were interviewed. I assigned numbers 1-200 in small pieces of paper and then folded them. The participants picked the numbers randomly and those with even numbers participated in the study.

Data collection methods

Questionnaires were used for data collection. Questionnaires were prepared in English and verbally translated into the local language during interview time. Diagnosis of undernutrition was based on weight for height or length, weight for age and height for age in the z-scores.

Data analysis

All data collected was edited, coded and errors corrected. It was then analyzed electronically using

Microsoft Excel and Spice.

Quality control

- The questionnaires were cross-checked at the end of every day for completeness and correct filling of questionnaires was ensured.
- Efforts were made to translate the questions into the local language of the respondents for easy understanding of questions so as to generate accurate responses.
- Pretesting of questionnaires was done

Ethical Considerations

A letter of introduction was acquired from the faculty of clinical medicine and dentistry and was presented to the HRRH administrator to grant permission to conduct the study. Respondents were requested for their verbal consent and ascend prior to interview and confidentiality was maintained throughout the research process. Respondents were given equal chances, treatment and rights at all times of the study.

RESULTS

Prevalence of undernutrition among children under five years attending HRRH Hoima district.

In the study 73% were well nourished,

15% of the children were stunted, 8% were Underweight and 4% were wasted as shown in Table 1 below.

Table 1: Prevalence of under nutrition among children attending Hoima Regional Referral Hospital, Hoima district.

Nutrition index	Over all status (%)
Stunting	15
Wasting	4
Underweight	8
Well-nourished	73

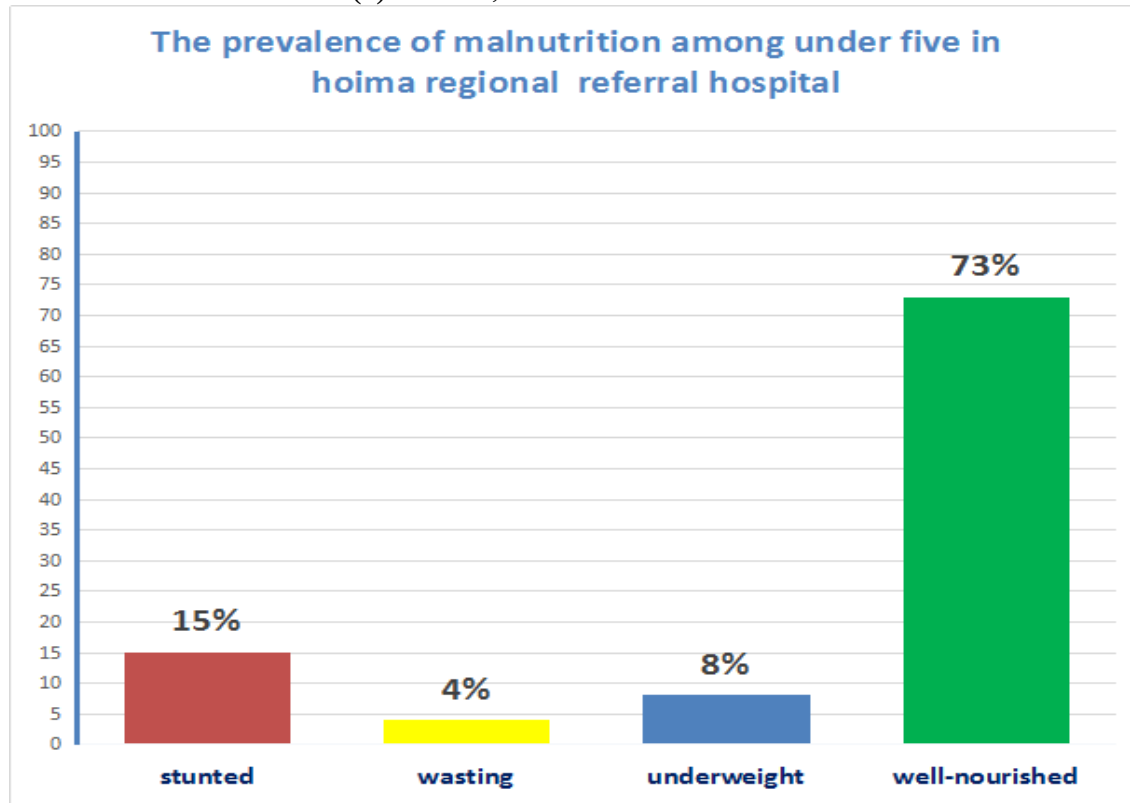


Figure 1: Social demographic characteristics of Children and their caretakers

In the study, 57% of the study population were females and 43% were males. The highest number (47%) of children were between 13-36 months and the least (22%) were those less than 13 months, 40% were of 1st birth order, and the least (5%) were

of 5th birth order. Also in the study 50% of the children were of birth interval 1-2 years, 42% were of birth interval 3-4 years and 8% were of birth interval 5-6 years as shown in table 2 below.

Table 2: child factor

Child factor	Frequency	Percentage (%)
Sex		
Male	43	43
Female	57	57
Age in months		
<13	22	22
13-36	47	47
37-59	51	51
Birth order		
1	40	40
2	23	23
3	28	28
4	12	12
5	5	5
Birth interval in years		
1-2	50	50
3-4	42	42
5-6	8	8

Maternal factor

The majority of mothers in the study were married (87%) while the least 13% were single mothers, the Highest 54% were peasants while the least (20%) were businesswomen by occupation, maternal

ages between 30-39 years (40%) were most while age between 40-49years (12%) were least and mostly 36% of mothers in the study reached primary school while least (6%) had non-formal education, as depicted in table 4.3 below.

Table 3: maternal factors

Maternal factor	Frequency	Percentage
Mothers age at birth in		
<20	15	15
20-29	33	33
30-39	40	40
40-49	12	12
Education level		
Non formal	6	6
Primary	39	39
Secondary	36	36
College/ university	19	19
Marital status		
Single	13	13
Married	87	87
Maternal occupation		
Peasant	54	54
Employed	26	26
Business	20	20

Relationship between child and maternal factors with under nutrition among children below five years attending Hoima Regional Referral Hospital, hoima district.

Relationship between child factor and under nutrition among children under five years old attending Hoima Regional Referral Hospital, Hoima District.

According to the study, 11.6% of the males were stunted whereas 17.5% of the females were stunted. Among the children who were stunted, the highest prevalence was seen among those aged 13- 36(23.4%),

birth order 1(20%), and birth interval between 5-6years (25%). Wasting was high among females (5.3%), Age 13-36(6.4%), birth order 5(20.0%) and birth interval 1-2 years (6.0%), breast feeding <6months (5.0%) and those who take less than 5 meals per day had (11.1%). Underweight was high among females (8.8%), Age 37-59(12.9%), birth order 1(10%) and birth interval 5-6(25.0%), those breast fed less than 6months (10.0%) and those who had less than 5 meals a day were (22.2%). As shown in table 4.4 below.

Table 4: Relationship between child factors and under nutrition among children under five years attending HRRH Hoima District

Variables	Total number	Stunting		Wasting		Under weight		Well nourished	
	N=100								
		N	%	N	%	N	%	N	%
Sex									
Male	43	5	11.6	1	2.3	3	7.0	34	79.1
Female	57	10	17.5	3	5.3	5	8.8	39	68.4
Age (months)									
<13	22	1	4.5	0	0.0	1	4.5	20	91.0
13-36	47	11	23.4	3	6.4	3	6.4	30	63.8
37-59	31	3	9.7	1	3.2	4	12.9	23	74.2

Relationship between maternal factors and under nutrition among children under five years attending Hoima Regional Referral Hospital, Hoima district.

Among the mothers whose children were sampled for the study; The highest number of those who were stunted were born to mothers who were 20-29years (21.2%), those who had non-formal education (33.3%), single mothers (30.8%) and those who were peasants by

occupation (22.1%). The highest number of those who were underweight were born to mothers who were aged < 20 years (13.3%), those who had non-formal education (16.7%), single (15.4%) and business women 15.0%. Among those who were wasted, the highest number were those whose mothers were aged < 20 years (13.3%), had non-formal education (16.7%), single (15.4%) and were peasants (5.6%) as shown in Table 5 below.

Table 5: the relationship between the maternal factor and under nutrition among children under five years attending HRRH Hoima District

Variables	Total100	Stunting (n)	%	Under weight (n)	%	Wasting (n)	%	Well- nourished	
								n	%
Age									
ofmother									
<20	15	2	13.3	2	13.3	2	13.3	9	60.0
20-29	33	7	21.2	3	9.1	1	3.0	22	66.7
30-39	40	6	15.0	3	7.5	1	2.5	30	75.0
40-49	12	0	0.0	0	0.0	0	0.0	12	100.0
Mothers education level									
Non- formal	6	2	33.3	1	16.7	1	16.7	2	33.3
Primary	39	10	25.6	4	10.3	2	5.1	23	59.0
Secondary	36	2	5.6	3	8.3	1	2.8	30	83.3
Collage/ university	19	1	5.3	0	0.0	0	0.0	18	94.7
Marital status									
Single	13	4	30.8	2	15.4	2	15.4	5	38.4
Married	87	11	12.6	6	6.9	2	2.3	68	78.2
Mothers occupation									
Peasant	54	12	22.1	5	9.3	3	5.6	34	63.0
Employed	26	1	3.8	0	0.0	0	0.0	25	96.2
Business	20	2	10.0	3	15.0	1	5.0	14	70.0

DISCUSSION

Prevalence of undernutrition among children below five years attending HRRH Hoima district

Prevalence of stunting, underweight, and wasting in the study were 15%, 8%, and 4% respectively. This indicated that there was a slightly lower level of malnutrition as judged by the WHO criteria. Stunting, in the study, was 15% which is lower compared to the western region

prevalence of 47.8% [10]. However, it was also more than half lower than the national prevalence of 33% in 2018 [8]. This prevalence was also much lower than the prevalence of 44.9% in the Rwenzori subregion [11]. The variation could be due to improvement of maternal and child care services especially during pregnancy and easy access to health care and nutritional services.

In the study, the prevalence of underweight was 8% which was slightly lower than the national prevalence (11%) according to UDHS 2016 and lower than the highest prevalence in the country (26%) in the Karamoja region [12]. This prevalence was also lower than the prevalence of 26.8% in Karamoja [13]. The difference may be due to the fact that Hoima district is relatively food secure and most mothers are relatively informed about the nutrition requirements in childhood. The prevalence of wasting reported in the study was 4% which was equal to the national prevalence of 4% according to [8] and lower than the known highest prevalence in the country (10%) in Karamoja and west Nile [12]. This difference is due to enlightenment about nutritional requirements in childhood, the availability of nutritional services at Hoima Regional Referral Hospital and the increase in functioning health units apart from Hoima Regional Referral Hospital which reduces the number of those seeking health care from HRRH.

predisposing factors to undernutrition among children below 5 years attending Hoima Regional Referral Hospital, Hoima district

Child factors

The results from the study show that a child's age, sex, birth order, and birth interval influence the child's nutritional status. Female children were more likely to be malnourished compared to their male counterparts, this is in slight disagreement with a study by [14]. The reasons are not well elucidated though [15] stated that boys are more influenced by environmental factors compared to girls. Children between 13 and 36 months old were more undernourished than those below 13 months and above 37 months old. This is in line with UBOS and Macros International 2007 where 13% of children aged 0 to 8 months were malnourished and 45% of children aged between 13 and 23 months were malnourished. This may be because of poor weaning practices. Malnutrition was common among children whose mothers delivered when the youngest child was less than 2 years. This is in line with [16]. It is the same with

UBOS and Macro International inc 2007, where malnutrition was highest if the birth interval was less than 24 months (41%). This may be because these children are less cared for and less breastfed (less than 6 months) when the mother is preparing for the new baby and also less fed. The supplementary feeds they use do not meet the AFASS criteria and also lack essential nutrients. In the study, nutrition was common in children who were breastfed for less than 6 months and those who had <5 meals per day.

Maternal factor

In the study, the majority of undernourished children were from mothers who did not go to school and those who ended up in primary school. This is in line with UDHS 2016 which showed that 37% of stunted children were from mothers who did not go to school and 30% from those who ended up in primary school. This is because these mothers lack knowledge about health skills related to nutrition, hygiene, preventive care and disease treatment. They may also be poor and unable to purchase food for their children. Children from single mothers were more malnourished than those from married mothers. This result agrees with a study carried out by [17] where married mothers were positively associated with good nutrition. This result may be because of the inability of single mothers to provide adequate needs for their children compared to their married counterparts who are supplemented by their spouses. The majority of undernourished children were peasants. This is in line with the study carried out in Vietnam by [18]-[21] which revealed that children from mothers who were labourers or farmers had a greater prevalence of stunting, being underweight and wasting than those from mothers who were employed [22-25]. This is because peasants grow foods which lack most nutrients and these farmers lack money to buy supplementary foods for their children [26-30]. Secondly, the food they grow may not be enough to sustain their family during the dry season. Most of the undernourished children were from

mothers aged less than 20 years followed by those of 20-29 years [30-32]. This may be because these mothers have unplanned

pregnancies and also lack knowledge on how to feed their babies [22].

CONCLUSION

In the study, the prevalence of stunting, being underweight, and wasting among children under five years attending Hoima Regional Referral Hospital were 15%, 8% and 4% respectively. Factors leading to undernutrition among children under five years attending HRRH were; Age years, Birth interval years, Maternal age, informal maternal education (mother who did not go to school), single motherhood

and being born to peasant mothers.

Recommendation

Health education about nutrition, exclusive breastfeeding and family planning by the stakeholders. The government should encourage girl child education, improve policies to make them remain in school and prevent early marriages.

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