Determinants of Malnutrition among Under-Five Children in Nakaseke and Nakasongola Districts, Uganda

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Abstract

Malnutrition is one of the major causes of mortality and morbidity among under-five children in Sub Saharan Africa. In this regard, a study was conducted in Nakaseke and Nakasongola districts of Uganda to understand the determinants in these districts. Data on household demographic and socio-economic characteristics including anthropometry on underfive children was used. Epi Info Nutrition module and Stata statistical softwares were used in analysis. A binary logistic regression model was fitted to establish the underlying determinants of malnutrition. Children aged 39-59 months were less likely to be underweight than those aged below twelve months. Stunting was more prevalent among children of peasant farmers than pastoralists. In conclusion, particular age-groups among underfive children and mothers occupation to be given focus. Special arrangement to have children of mothers engaged in cultivation brought to them regularly for breastfeeding could be useful.

Keywords: cultivation, proximate, vitamin and policymakers

1. Introduction

The World Health Organization in a recent report estimates that there are 178 million children that 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 (WHO, 2013). This consequently affects the intelligence level of children, their behaviour and school performance. The impaired mental development is taken as the most serious long-term handicap associated with underfive malnutrition. In Sub-Saharan Africa, 230 million under-five children are believed to be malnourished being associated with 54% underfive deaths (Gulati 2010; Kimokoti and Hamer, 2008).

In Uganda, malnutrition remains a serious health and welfare problem affecting the under-five children to whom it contributes significantly to mortality and morbidity. According to Uganda Demographic and Health Survey of 2006, nearly four in ten Ugandan children under-five years of age (38%) are stunted (short for their age), six percent are wasted (thin for their height), and sixteen percent are underweight (UBOS & Macro International Inc 2007). Indeed the story may not be different for the districts of Nakaseke and Nakasongola in Uganda. The Ugandan government has put in place tremendous efforts in reducing the prevalence of malnutrition in the country through effective nutrition programs which act directly on feeding practices. The 2004/2005 Uganda food and nutrition policy reform focuses on policies and guidelines on anaemia, breastfeeding, HIV/AIDS and a number of other nutrition related disorders prevalent in the country (MoH and MAAIF, 2005). Additionally, the Government also launched the Uganda Vision 2040 and National Development Plan (2010-2015) that focuses also on nutritional wellbeing of children (GoU, 2013).
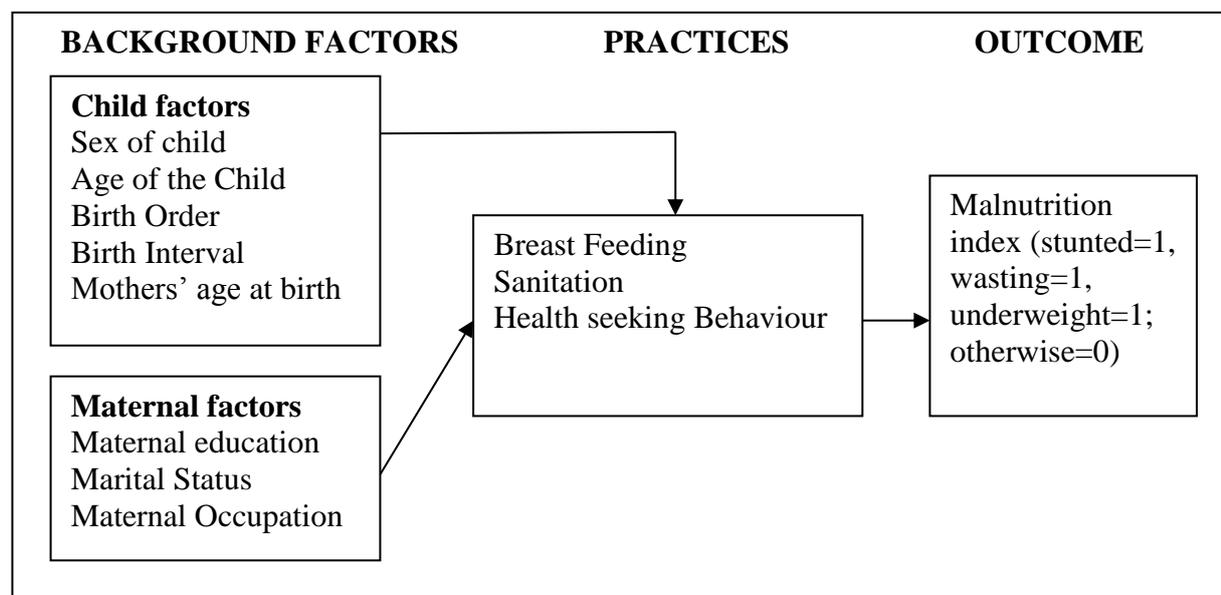
Despite the above efforts, malnutrition remains a big threat to almost all regions in Uganda particularly in the districts of Nakaseke and Nakasongola. Data from the previous five Uganda Demographic and Health Surveys (2011, 2006, 2001,1995, 1989) show that the nutrition indicators have not improved much over the past 15 years (UBOS and ICF International Inc 2012). Given the fact that a lot of studies on the determinants of malnutrition among underfive children have been conducted in the developing countries, there is need to examine if the same factors are responsible for malnutrition among children underfive years in the districts of Nakaseke and Nakasongola hence forming the research gap. The major objective of the study was to assess the determinants of

malnutrition among under-five children in Nakaseke and Nakasongola districts of Uganda. The specific objectives included; (i).To ascertain the relationship between child factors and malnutrition among underfive children. (ii).To ascertain the relationship between maternal factors and malnutrition among children underfive children.

2. Conceptual Framework

Figure I shows that in developing countries and particularly in Sub-Saharan Africa, under-five child malnutrition is normally determined by a large number of factors to the extent that it sometimes becomes difficult to predict the risk factors (Victoria *et al.,* 1997). Such factors act through a number of interrelated proximate determinants to bring about underfive malnutrition that is stunting, underweight and wasting. The demographic (child factors) and socio-economic factors (maternal factors) such as age of child, birth order, mothers age at birth, mothers education level, marital status as well as maternal occupation work through proximate variables like the duration of breast feeding, sanitation and mothers health seeking behaviours to determine underfive malnutrition.

Figure I: Conceptual Framework showing the determinants of malnutrition among underfive Children

BACKGROUND FACTORS	PRACTICES	OUTCOME
Child factors Sex of child Age of the Child Birth Order Birth Interval Mothers' age at birth	Breast Feeding Sanitation Health seeking Behaviour	Malnutrition index (stunted=1, wasting=1, underweight=1; otherwise=0)
Maternal factors Maternal education Marital Status Maternal Occupation		

3. Methods

The study population included children below five years in Nakaseke and Nakasongola districts. Secondary data was obtained from Africa Innovations Institute (AfrII) of 104 children collected in households within the two districts. Anthropometry technique was used to assess the malnutrition status of under-five children (Gibson, 2005). Child variables that included age, sex, height and weight were entered in Epi Info7 software-nutrition module to generate measurement indices of height-for-age, weight-for-age and weight-for-height. The indices generated were compared with standard reference values for WHO Child Growth Standards and CDC 2000 to obtain the Z-scores. Anthropometry data was entered in Epi Info7 nutrition module to generate the nutrition indicators of stunting, wasting and underweight which were entered in stata programme and then merged with the demographic and socio-economic data for analysis. Descriptive statistics as well as cross tabulations were generated. Pearson Chi Square (χ^2) test (in equation 1.1) was performed to establish the relationship between the independent variables and under-five malnutrition.

$$\chi^2 = \sum_{i=1}^{r} \sum_{j=1}^{c} \frac{(O_{ij} - E_{ij})^2}{E_{ij}} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots(1.1)$$

Where;

O is the observed frequency while E is the expected frequency, r is the row and c is the column. At multivariate analysis, a binary logistic regression model was fitted to ascertain the determinants of malnutrition among children underfive years (in equation 1.2).

$$Logit(Ma\ln utrition) = \log\left(\frac{p}{1-p}\right) = \beta_o + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4$$

$$+ \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \varepsilon\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots(1.2)$$

Where;

β_0 is a constant, β_{1-8} are unknown coefficients, p is the probability of having a malnourished child and X_i are the explanatory variables; X_1 is sex of child, X_2 is age of child, X_3 is birth order, X_4 is birth interval, X_5 is mother's age at birth, X_6 maternal level of education, X_7 is marital status and X_8 is maternal occupation. The study limitation was that the dataset used missed out some variables of interest on child malnutrition that included duration of breast feeding and Body Mass Index of the mother. The sample size of 104 respondents was also relatively small hence could have had an effect the outcomes of the study.

4. Results

Background characteristics of children and caretakers

More than half of the under-five children in the study were females (51%) and majority was aged 37-59 months (54.8%). Half of the children (50%) were of birth order 1-2 with a few in the birth order of 3-4 (25%) and 5+ order (25%) respectively. Most of the children were of birth intervals equal or less than two years (44.2%). On the age of the mother at birth, majority of the children had their mothers aged 30-39 years (44.4%) while quite a significant proportion was also from children whose mothers at birth were aged 20-29 years (32.7%). Few of the children were from mothers aged less than 20 years (15.4%) and 40-49 years (11.5%) at birth respectively(Table I).

Table I: Underfive Child factors

Child factors (n=104)	Frequency	Percentage (%)
Sex of Child		
Male	51	49
Female	53	51
Age of the child(months)		
≤ 12	3	2.9
13-36	44	42.3
37-59	57	54.8
Birth Order		
1-2	52	50
3-4	26	25
5+	26	25
Birth Interval(years)		
≤ 2	46	44.2
3-4	43	41.3
5-6	15	14.5

Age of mother at birth (years)		
<20	16	15.4
20-29	34	32.7
30-39	42	40.4
40-49	12	11.5

Maternal factors of malnutrition among under-five children

Most of the mothers had received primary level education (73.1%) and quite a few had never been to school (15.4%). The level of education could impact on child care as many of the mothers may lack the basic skills and knowledge to look after their children. Most of the mothers were married/cohabiting (66.3%). Most of the mothers were peasant farmers (50%). Children whose mothers were doing business or civil servants were also significantly many (30.8%) as well as the pastoralists (13.4%). Most of the mothers who did business lived nearer to the trading centres in Nakaseke and Nakasongola districts. There were also a few children whose mothers did handcrafts as their occupation (5.8%). The results are found in Table II.

Table II: Maternal factors of malnutrition among under-five children

Maternal factors(n=104)	Frequency	Percentage (%)
Education level		
No education	16	15.4
Primary	76	73.1
Secondary+	12	11.5
Marital status of the mother		
Never Married/Separated	35	33.7
Married/Cohabiting	69	66.3
Maternal Occupation		
Peasant farmer	52	50.0
Pastoralist	14	13.4
Business/ civil servant	32	30.8
Handcrafts	6	5.8

Levels of malnutrition among underfive children

Results indicate that stunting was the most common malnutrition problem (38.5%) among underfive children in Nakaseke and Nakasongola district. There was also quite a high prevalence of wasting and underweight among underfive children given the fact that the sample of children was not very big. The findings are slightly higher than the Uganda national figures of stunting at 33%, and wasting at five percent. There is an almost similar proportion of children underweight with the national prevalence of 14% according to Uganda Demographic and Health Survey (UBOS and ICF International Inc 2012).On the levels of malnutrition by district; results indicate that stunting was higher in Nakaseke district than in Nakasongola. Similarly, child wasting and underweight were highest in Nakaseke than in Nakasongola district. The levels of malnutrition among children underfive years in Nakaseke and Nakasongola districts in Central Uganda are presented in Table III.

Table III: Levels of malnutrition among underfive children

Malnutrition Index	Overall status (%)	Nakaseke (n=54)	Nakasongola (n=50)
Stunting	38.5	23(42.6%)	17(34.0%)
Wasting	16.5	12(22.2%)	5(10.2%)
Underweight	13.5	9(16.7)	5(10.0%)

Relationship between child and maternal factors with malnutrition

On the age of a child, there was a significant relationship between age of child and underweight (p=0.041**<0.05). There were few children underweight from 13-59 months (only five) unlike those aged 12 months and below. Also children aged 12 months and below were more stunted and wasted than those older from 13-59 months. There was a significant relationship between mothers occupation and malnutrition (p=0.05). More stunted children were from peasant farmers as well as business/civil servants. In the same vein, wasting and underweight was common among peasant farmers and pastoralists (result table not shown).

Determinants of malnutrition among under-five children

Results in Table IV indicate that children aged 37-59 months were less likely to be underweight (OR=0.76) than their counterparts who were aged 12 months and below (reference category) in Nakaseke and Nakasongola districts. In fact children aged 37-59 months and child underweight were statistically significant(p=0.03**<0.05) at 95% confidence interval. Similar findings have been reported at national level where the proportion of underweight children is lowest among children 36-59 months old and highest among those 6-8 months old (UBOS and ICF International Inc 2012). Similar findings have been reported in Vietnam, India, Nigeria and Kenya (Nguyen and Kam., 2008; Babatunde., 2011 and Kabubo-Mariara etal., 2006). The findings are however contrary to the study in Ethiopia that found out that underweight had a positive linear relationship with age of a child (Yimer 2000). Findings also indicate that there is a significant relationship between woman's occupation and stunting among underfive children (p=0.05) in Nakaseke and Nakasongola districts. Children whose mothers were pastoralists (OR=0.12) were less likely to be stunted unlike their counterparts whose mothers were peasant farmers (reference category). Mothers engaged in pastoralism are believed to supplement the nutrition value of their children with cow milk and other milk products which consequently reduces the risk of stunting unlike the peasant farmers and business people. According to Salah and Nnyepi (2006), crop cultivators were more likely to have stunted children. Similarly, a study done in Vietnam found out that children from mothers who were crop cultivators had an increased risk of stunting because they rarely get time to care for their children hence end up leaving them under the care of elder siblings or inexperienced maids (Nguyen and Kam, 2008). In another study, it was found out that some mothers especially peasant farmers in most cases fail to provide complementary feeding to their children because they cannot afford (Olwedo etal., 2008).

Table IV: Determinants of malnutrition among underfive children in Nakaseke and Nakasongola districts (showing only significant variables).

Variable	Stunting		Wasting		Underweight	
	OR	p	OR	p	OR	p
Age of child (≤12*months**)**						
13-36 months	0.38	0.16	0.79	0.78	0.67	0.65
37-59 months	0.76	0.66	0.79	0.78	4.14	**0.03**
Mothers' occupation(Peasant *)						
Pastoralist	0.12	**0.05**	2.53	0.33	2.11	0.55
Business/civil servant	2.71	0.14	1.58	0.56	1.15	0.91
Handcraft	1.23	0.92	0.24	0.21	1.15	0.90

* Reference category   ** statistically significant at 95% C.I

5. Conclusions

Results from the analysis confirm that age of a child and maternal occupation are one of the most significant determinants of malnutrition in Nakaseke and Nakasongola district. The study therefore underscores the age groups prone to malnutrition challenges as well as the particular occupations among women that could pose a risk of malnutrition to the underfive children.

The study therefore recommends exclusive breast feeding and proper complementary feeding especially among children aged less than three years. This will consequently reduce on the underweight children who are mostly aged less than three years in the districts of Nakaseke and Nakasongola districts. The study also recommends a special arrangement for mothers engaged in cultivation to have their children breastfed regularly by having their babies brought to the gardens at regular intervals. The mothers could also visit their babies at home regularly from their gardens to ensure that proper nutrition is given to their children. There is need for a bigger study to be carried out in the districts of Nakaseke and Nakasongola covering more children to establish the determinants of underfive malnutrition. Perhaps another study may establish significant determinants like education of mother, sex of child, birth order, birth interval, age of mother and marital status since most of them were found significant in the literature review.

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