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Factors Influencing the Prevalence of Malnutrition among Children aged Five Years and below Attending Fort Portal Regional Referral Hospital in Kabarole District Western Uganda

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ABSTRACT

Uganda had one of the highest levels of childhood stunting in sub-Saharan Africa. It was well documented that the nutritional status of young children was one of the most sensitive indicators of sudden changes in health status and food availability, acting as a proxy indicator of socio-economic development. Fort Portal District, the focus of the present study, was one of the most fertile areas in Uganda, with high per capita output of most foods. However, earlier studies in Fort Portal District found that over 40% of children below five years of age were stunted. The objective of this study was, therefore, to assess the prevalence of malnutrition and the factors influencing the nutritional status of children below five years of age, attending Fort Portal Regional Referral Hospital, western Uganda. The study design was a cross sectional descriptive survey, using both qualitative and quantitative methods of data collection. A questionnaire was administered to 87 caretakers of children 6-59 months, which explored the various factors that could be affecting the nutritional status of the children. Key information was also sought from a focus group discussion of a few selected mothers. Results revealed that stunting was highly prevalent with 41.6% of the children stunted. Under-weight and wasting were established at 15.7% and 3.4%, respectively. Education level of mother/caretaker (p=0.02), age of child (p=0.03), receipt of information on child feeding (p=0.009), illness (p=0.004) and time of introduction of other foods (p=0.031) were significantly related to child stunting. On the other hand, household size, number of meals per day and awareness about the causes of malnutrition, were non significantly associated with child stunting. These findings indicate that malnutrition, especially stunting, in this cohort of children is a big problem. Poor education levels of the mothers/caretakers and poor child feeding practices are some of the factors identified as major contributors to this problem. It is therefore recommended that appropriate nutrition interventions, particularly equipping mothers/caretakers with knowledge and skills in child feeding, child health, sanitation and other best practices for proper childcare, be put in place to address the problem of childhood malnutrition in Fort Portal District and other areas in Uganda, and indeed in Sub-Saharan Africa, with similar settings.

Keywords: Stunting, Nutritional status, Malnutrition, Caretakers, Mothers

INTRODUCTION

Malnutrition is abnormal physiological condition caused by deficiencies, excesses or imbalances in energy, protein and/or other nutrients [1-4]. Malnutrition is also defined as a state in which the physical function of an individual is impaired to the point where he/she can no longer maintain adequate bodily performance processes such as growth, pregnancy, lactation, physical work, and resisting and recovering from disease. The term malnutrition, addresses 3 broad groups of conditions. Under nutrition, which includes wasting (low weight-for-height), stunting (low heightfor-age) and underweight (low weight-for-age). Micronutrient-related malnutrition, which includes micronutrient deficiency or excess. Overweight, obesity and diet-related non communicable diseases [5-9]. This study will specifically deal with under nutrition as a form of moderate acute malnutrition. Globally, it is estimated that there

https://www.eejournals.org **Open Access** are nearly 60 million children with malnutrition and 20 million with severe acute malnutrition (SAM). About 9% of sub-Saharan African and 15% of south Asian children have moderate acute malnutrition and about 2% of children in developing countries have SAM [10]. The majority of those affected are found in South Asia and Sub Saharan Africa. Approximately 1-2 million children die every year from severe acute malnutrition. It is reported that SAM is the commonest reason for pediatrics hospital admission in many poor countries. In sub-Saharan Africa, malnutrition is still a serious public health problem in and requires urgent attention. A study by medical journey in the refugee camps in central and East Africa between 2008 and 2012 shows an upward trend, suggesting deterioration over the Page | 30 years. Well thought out and targeted intervention programs are long overdue. There is need to emphasize on the importance of having a well-established surveillance system which would ensure necessary and timely action $\lceil 11 \rceil$. These children are at high risk of mortality and morbidity, and may carry adverse health and mental consequences in their lives. Most of them live in poor societies, and with impaired physical and mental capacities. They are bound to enter a vicious cycle of poverty and malnutrition for generations to come [12]. In Uganda, malnutrition contributes to about 60 percent of child mortality. The 2011 Uganda Demographic and Health Survey found that 33 percent of children were stunted and that only 6 percent of children aged 6 to 23 months were fed appropriately, based on the recommended infant and young child feeding practices. Household food insecurity, poor nutrition, and inadequate access to health care all contribute to the problem. Malnourished children and their caregivers often trek long distances for assistance at health facilities, which routinely lack supplies and trained staff. In addition, families frequently lack funds to support proper recovery. Malnutrition in Uganda can take many forms, including chronic malnutrition (stunting, or low height-for-age), underweight (low weight-for-age), acute malnutrition (wasting, or low weight-for-height), anaemia, vitamin A deficiency, iodine deficiency, and low birth weight (< 2.5 kg) [13]. At least 19 million preschool children are affected by severe acute malnutrition (SAM) [14]. Malnutrition is a contributing factor to nearly 60% of the over 10 million deaths that occur annually among children under five years old in developing countries [12]. About 9% of sub-Saharan African and 15% of south Asian children have moderate acute malnutrition and about 2% of children in developing countries have SAM [10]. In Uganda, malnutrition remains one of the major causes of child morbidity resulting into retarded growth and contributes to about 60 percent of child mortality. In a study conducted in Uganda in 2009 in Masaka and Rakai peri-urban centers on common causes of malnutrition and its management, out of 200 mothers involved in the study, 144 (72%) acknowledged for their children having had stunted growth and underweight of which only 26 mothers (13%) revealed it having been self-solving while the rest required medical health intervention either from a clinic or government health centre [11]. The burden of malnutrition among under-five children in Kabarole district is on up rise despite the intervention put across by the government. A few studies determining the factors contributing to malnutrition among children aged five years and below have been conducted in the study area making little data available on the problem. Thus, this study was designed to determine factors influencing prevalence of malnutrition among children aged five years and below attending Fort Portal Regional Referral Hospital in Kabarole district. METHODOLOGY

Area of Study

The study was carried out at Fort Portal Regional Referral Hospital in Kabarole district, Western Uganda. The population here is composed of different tribes but the most common ones are Batoro. The economic activities done are small scale retail shops, small scale mini supermarkets, small scale marketing and small scale farming, however there are other activities like trade in addition to agriculture (plantation, animal husbandry, and fishing). Kabarole has been selected because the local people have a variety of food stuffs but there has been a consistent level of malnutrition of children under five years in the area and therefore there is a need to identify factors contributing to this problem.

Study Design

A descriptive cross sectional study was used for children under five years brought to Fort Portal Regional Referral Hospital in Kabarole district. A cross sectional study was used because it involved interacting with parents or care givers directly whose children are affected by malnutrition such that data collected correlates with the factors contributing to malnutrition. This helps so that suitable solutions can be generated to help the people in prevention of malnutrition in under five children.

Study Population

The study was done among children under five years of age brought to Fort Portal Regional Referral Hospital in Kabarole district. A total of 87 caregivers was considered during the study.

Sample Size Determination

The sample size was determined using Fishers *et al.* [15] formula given by the method below, n= $z^2 pq/d^2$

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n= minimum sample size

d = margin of error

p= prevalence (6%, [16])

_____ q=1-p

Page | 31 Therefore, taking

p = 6/100 = 0.06z = 1.96

2 = 1.30

q=1-p = 0.94

d= 5% or 0.05

 $n = \frac{1.96^{2} X 0.06 X 0.94}{0.05^{2}}$

n= 87 children-care giver pairs.

Therefore, sample size of 87 respondents was considered during the study.

The sampling method

The study was carried out among children under five years of age brought to Fort Portal Regional Referral Hospital in Kabarole district, a total of 87 caregiver-children pairs will be considered, using a random sampling method where all those who came within the time of the study were considered for an interview and caretakers or any elder participating in the study was considered to provide relevant information on behalf of the children.

Inclusion criteria

The study included all parents with children under five year of age. All children under five-year age of intended population whose caretakers accepted to give consent, parents and caretakers of children under five-year age attending Fort Portal Regional Referral Hospital in Kabarole district.

Exclusion Criteria

Children above five years of age, those who had emergence medical conditions, parents and caretakers of children who did not give consent, were excluded.

Dependent variables

Malnutrition among children aged below five years is the dependent variable.

Independent variable

Factors contributing to malnutrition are the independent variable in this study.

Study Tools/Instruments

A semi-structured questionnaire containing bio data of the respondents both the care taker and the child and also questions on factors contributing to malnutrition in children under five were included. Writing materials including pencils & pens were used.

Data Analysis and presentation

Data was collected manually and analyzed by Microsoft Excel 2016 and then eventually presented using tables.

Ethical consideration

An introductory letter was obtained from faculty of clinical medicine and dentistry of Kampala international university, Western Campus and presented to the hospital director of Fort Portal Regional Referral Hospital in Kabarole district to be allowed to collect data. The participants' consent was obtained by informing them that the information obtained from them was to be treated with confidentiality and their consent would be valued and given utmost respect.

RESULTS

Nutritional status of the children

The nutritional status of the children using the nutritional indicators of stunting, underweight and wasting. Stunting was by far the most prevalent undernutrition problem in the study area, with almost half of the children (41.6 percent) stunted. The overall prevalence of under-weight and wasting was 15.7 percent and 3.4 percent, respectively. However, older children (25-60 months) had a higher prevalence of stunting (29.2%) and underweight (16.2%) than younger children (0-24 months), where stunting prevalence was 12.4% and underweight 14.3%, respectively. None of the children 0-24 months was wasted (0.0%) compared to 3.4% of the children 25-60 months.

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Table	1		

				I abit I					
	Age groups	Nutritional status indicator							
		HAZ(stunting) WAZ(Underweight)				WHZ(Wasting)			
		Frequency	Percent	Frequency	Percent	Frequency	Percent		
	0-24	10	12	3	14.2	0	0.0		
ge 32	25-60	25	29.5	10	17	3	3.3		
	Total	35	41.6	13	14.6	3	3.3		

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The majority of the caretakers were aged 20-24 (37.7%) and had children above 2 years of age (30.2%). The age brackets of 15-19 and 25-29 (table 2) years also had a relatively higher number of children each, (23.7%). The proportion of caretakers with the least number of children, for both age groups, was that in the age bracket 40-44 (0.1%).



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The highest level of education by most caretakers was primary school level (49.4%), with most children below two years if age (29.0%) having their caretakers attaining this level. For both age groups, secondary education was attained by very few caretakers (3.3% and 5.4% respectively). A similar trend was repeated in both age groups, when it came to caretakers who had attained tertiary education (2.2% and 4.3% respectively).



Figure 3

When occupation was considered, the majority (81.7%) were peasant farmers. Probably due to low literacy levels, only 15.1% and 3.2% were business persons and teachers, respectively.



Figure 4

On the social aspect, more than half of the caretakers (55.9%) were married, while 36.6% were single. Only 2.2% were widowed while 5.4% were divorced. Majority of the households (44.1) were moderate in size, with most children above two years (29.5%) falling in this category of household size. Households which were extra big were only 6.5%, compared to 17.3% which were small in size.

Child feeding practices

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Complementary feeding was started in two thirds (60.7%) of the children before they were 6 months old, while only 39.3% were started at 6 months. The majority of the children (71%) were fed three times a day, while only 29% were fed more than three times a day.



Figure 5 Information on child feeding

The results show that more than half (53.6%) of the mothers/caretakers had never received any information on child feeding while 46.4% had received such information.



Perception about the causes of malnutrition

In order to assess mothers/caretakers' knowledge of the factors that may contribute to poor nutritional status among their children, the majority (59%) identified poverty as the major cause of under-nutrition. The proportion of mothers who didn't know of any causes of malnutrition was 28%, while inadequate food supply and lack of awareness about good nutrition was reported 12% and 1 percent, respectively. Lack of awareness was defined as someone who lacked knowledge about proper nutrition requirements for children.

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Influencing factors for stunting rates among children above two years of age

Cross-tabulated results, the relationship between nutritional status and stunting of children above two years of age. The factors with a significant association with child stunting under two years were education level of caretaker (p=0.008) and if the caretaker had received information on child feeding (p=0.009). The factors non significantly associated with child stinting were household size (p=0.379), child illness (p=0.325), time of introduction of new foods (p=0.142), number of meals per day (p=0.108) and causes of malnutrition (p=0.353).

Influencing factors for stunting rates among children below two years of age

The only factor with a significant association with child stunting under two years was education level of caretaker (p=0.004). Information on child feeding (p=0.205), household size (p=0.06), child illness (p=0.811), number of meals per day (p=0.09), time of introduction of new food (p=0.219) and causes of malnutrition (p=0.679), were all non-significantly associated with child stunting below two years of age.

Characteristic	Respondents	%children	%children	Total		
	-	<2 years	>2years			
Age of respondents (years)						
15-19	20	3	22	25		
20-24	38	8.6	32	39		
25-29	22	13.2	11.1	25.6		
30-34	4	3.1	2.4	6.1		
35-39	5	2.1	3.2	5.3		
40-44	1	0.0	1.1	1.1		
Education level						
None	30	15.6	19.3	36.0		
Primary	45	28.7	21.2	49.7		
Secondary	9	3.5	6.1	8.8		
Tertiary	3	1.8	3.5	5.6		
Occupation						
Peasant	78	40.7	42.4	83.2		
Teacher	5	1.2	2.4	3.7		
Business person	15	8.9	6.8	15.6		
Marital status						
Single	30	19.7	17.9	37.0		
Married	50	27.0	30.4	56.6		
Divorced	4	3.1	2.1	5.2		
Widowed	2	0.0	2.1	2.0		
Household size						
<4(small)	16	6.2	10.4	17.7		
5-7(moderate)	39	16.8	25.8	43.9		
8-10(big)	26	11.7	16.5	28.8		
10 + (extra big)	6	3.0	4.1	7.3		

Table 2. Characteristics of respondents n^{-67}

		Stunted		Normal		p-value
	Education level	Frequency	Percent	Frequency	Percent	0.008
	None	13	60.2	3.9	14.8	
Page 36	Primary	6	34.5	15	58.0	
	Secondary	1	4.4	2.9	10.2	
	Tertiary	1	4.9	4.9	17.0	
	Information on child					0.009
	feeding					
	Not received	18	76.0	11.1	36.0	
	Received	5	24.0	17.2	64.0	
	Household size					0.379
	<4	4	10.9	4.8	24.2	
	5-7	7	35.0	14.3	57.1	
	8-10	8	49.1	8	26.7	
	10+	3	13.0	1	3.2	
	Child ill previously					0.325
	Child ill	8	29.4	6	19.5	
	Not ill	17	70.6	22.5	80.5	
	No. of meals/day					0.108
	<3meals	12	48.2	8	26.0	
	>3meals	13	51.8	20	74.0	
	Introduction of new					0.142
	food					
	Before 6 months	9	33.9	15	55.0	
	At 6 months	14	66.1	13	45.0	
	Causes of					0.353
	malnutrition					
	Lack of awareness	6	27.1	3	11.3	
	Don't know	7	32.8	14	49.0	
	Poverty	10	40.1	11	36.0	
	Inadequate food	0	0	1	3.7	

 Table 3

 Factors influencing stunting rates among children above two years of age

		Stunted		Normal		p-value
	Education level	Frequency	Percent	Frequency	Percent	
	None	9	66.5	5	17.2	0.004
Page 37	Primary	4	33.5	18.9	67.6	
	Secondary	0	0.0	4	14.2	
	Tertiary	0	0.0	0	0.0	
	Information on child feeding					0.205
	Not received	10	66.1	13	46.5	
	Received	4	33.9	15	53.5	
	Household size					0.06
	<4	4	20.4	7	21.4	
	5-7	7	46.2	13	42.8	
	8-10	2	13.1	10	34.8	
	10+	3	20.3	0	0.0	
	Child ill previously					0.811
	Child ill	7	47.0	12	42.0	
	Not ill	9	53.0	16	58.0	
	No. of meals/day					0.09
	<3meals	12	74.5	14	46.8	
	>3meals	3	25.5	16	53.2	
	Introduction of new food					0.219
	Before 6 months	9	54.0	18	60.8	
	At 6 months	7	46.0	11	39.2	
	Causes of malnutrition					0.679
	Lack of awareness	3	20.2	5	16.1	
	Don't know	2	13.3	7	22.9	
	Poverty	9	66.5	16	57.9	
	Inadequate food	0	0.0	1	3.1	

 Table 4

 Factors influencing stunting rates among children below two years of age

DISCUSSION The nutritional status of the children

Stunting

Stunting was by far the most prevalent under-nutrition problem in the study area, with almost half of the children in the sample (44.6%) being stunted. This level of stunting is very high, well above the national average of 39 percent. The figure is similar to that of 44.3% obtained for Kabarole District by Jitta and co-workers [17] in the early 1990s in their secondary analysis of the Uganda Demographic and Health Survey data and more recent data of 46.3% found in pre-school children in the suburbs of Kampala City, Central Uganda. Similar to other studies, the level of stunting was higher in older children, compared to the younger ones.

Under-weight

Results for under-weight (14.6%) were lower than the national figure of 23 per cent and those for Kabarole District (25.7%) by Jitta and colleagues [17]. Under-weight (low weight-for-age) has elements of both chronic and recent under-nutrition. The data implies that the affected children experience a combination of inadequate food intake and diseases.

Wasting

Wasting is often taken as evidence of acute under-nutrition. The prevalence of wasting at 3.3 percent, though lower than national figure of 4.5 percent is still unacceptably high. Wasting is a consequence of either extreme food shortage, poor caring practices and/or frequent infections. It should be noted that after an acute infection, weight gain is relatively rapidly, but linear growth remains stagnant and the situation is worsened by repeated episodes of

illness. In addition, in cases like Uganda where most of the children are already stunted, the wasting indicator is usually insignificant, and hence more emphasis should be put on underweight and stunting rather than wasting.

Factors influencing childhood malnutrition, factors related to the child, and Child illness

For children above and below two years of age, the results are in dis-agreement with those of Kikafunda et al. [18], who found that poor health significantly increased child stunting. Whereas this study targeted specific illness, this study did not, and hence a probable cause for the discrepancy. The relationship between illness and malnutrition is twofold; first, malnutrition makes children vulnerable to diseases, and in turn a child loses appetite. If not properly fed, they are likely to be malnourished. Illness also increases the metabolism that in turn interferes with assimilation of nutrients into the body. The reduced food intake results in the breakdown of body reserves or other tissues leading to loss of weight and recurrent fever which leads to stunting. The situation is even worse if the child is suffering from diarrhoeal diseases because of the rapid loss of water and other nutrients from the body. Diarrhoea facilitate undernutrition in infants [19-21].

Feeding practices

World Health Organisation and UNICEF have recommended that complementary foods should not be given before six months of age [14]. Introducing these foods too early reduces the amount of breast milk the child is taking in and introduces the child to pathogens and subsequent diarrhoeal diseases and in most cases in developing countries, these foods are not really tailored to the needs of the infant [22, 23]. In this study, introduction of complementary foods was not associated with child stunting, for both age groups. The number of meals a child takes has an effect on his/ her nutritional status, since it is related to nutrient intake. The more the frequency of feeding the higher the chances of meeting the recommended daily nutrient intake. Results from this study, from both age groups, however, had a non-significant relationship between the level of stunting and the amount of food a child ate in a day.

Factors related to the mother and Low education level of the mother

High education, especially secondary and tertiary education, is associated with high socio-economic status, good quality environment and good healthcare through nutritional knowledge, attitudes and practices. Increasing level of education of parents has been found to reduce incidences of under-weight. The results of this study, for both age groups, have a significant association between poor nutritional status and level of parental education are in agreement with results of the other studies, with malnutrition most prevalent among children whose mothers had low education levels compared to those whose mothers had attained higher education levels.

Knowledge about proper nutrition

The findings show that many of the caretakers of children under five years of age in the District did not have access to information on child feeding and care. Much as there were no significant relationships between child stunting and the causes of malnutrition in either age categories, the data could imply that there were no extension services in the district in form of community out-reach programs to educate the mothers and caretakers' of children on matters pertaining to nutrition. Consistent with other studies, lack of knowledge about proper nutrition could be attributed to the poor education level of women. Under-weight and stunting of children are significantly higher when parents have not had any education or when they cannot read or write. Quoting the words in the focus group discussion; "A woman may have all the food in the home but would keep on preparing one type of food for the children. Most women do not know what to prepare for young children and when food is prepared, it is not served on time" As Latham observed, the problem in most African settings is not about lack of food but lack of knowledge about food.

Factors related to the household

Household size

The results from this study show non-significant relationships between family size and level of stunting in both age categories. Nonetheless, big families are associated with polygamous practices and under such circumstances, one would expect such families to have malnourished children since the available food must be shared among many people, thus reducing the amount available per person. Contrary to our findings, Jitta et al. [17] found that underweight and stunting among children was significantly affected by family size with bigger households (8 people or more) being more affected. Children in bigger households not only compete for food but also for maternal care and other resources.

CONCLUSION AND RECOMMENDATION

Malnutrition, especially stunting, in this cohort of children in Kabarole District, was found to be very high. A range of factors including low education levels of mothers/caretakers, child illness and poor child feeding practices were identified as some of the key contributors to malnutrition of these children. Outreach programmes targeting teaching mothers/caregiver about the importance of good nutrition for proper child growth and development, should be carried out by appropriate sector

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