

Malnutrition among children under-five in Uganda: burden, causes and prospects in Karamoja Region

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Abstract

Malnutrition remains a global health problem and policy challenge especially for Sub Sahara African countries including Uganda. Children are majorly vulnerable since their growth and development depends on adequate nutritional intake. According to WHO (2013), 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. On the other hand, SPRING (2014), estimated that approximately 2.3 million children under the age of five are chronically malnourished in Uganda and the shortage of professional health workers and lack of access to health care services makes the situation even worse. It further revealed that children aged between 6-59 month living within Karamoja region with anemia were standing at 69.5% compared to the national target 50.0%, stunting under-five stood at 45% compared to the national target of 32%, underweight for children under-five was at 31.9% compared to national target of 10.0% therefore, the region has highest level of malnutrition prevalence in country compared to other regions. Causes of malnutrition are believed to be multifaceted, ranging from inadequate dietary intake and infections to socio- economic and environment factors. Methodology; Mixed method with descriptive survey design was adopted and 236 Children aged 0-59 month were assessed. Additional information was collected by interviewing 176 biological and caregiver using simple random sampling. Anthropometric measurements and structured questionnaires were used. Data was processed using Open Data Kit (ODK) and exported to Stata software for analysis. Then after, sex, age, height, and weight transferred with HHs number to ENA for SMART 2007 software to convert nutritional data into Z-scores of the indices; Height-for-age, weight-for-height and weight-for-age. Multivariate logistic regression was used to identify associated factors of malnutrition. The results from the survey study revealed that; 13.4%, 26.8% and 33.2% of children were wasted, underweight and stunted respectively. The severity of underweight was more prevalent in children aged between 30-59 month with 26.0% whereas stunting stood at 35.5% among the children aged 18-41 months. In addition, severe underweight, stunting and wasting was more prevalent in boys compared to girls. The main associated factors of stunting were found to be child age, breastfeeding practices while underweight was associated with food insecurity among others. This abstract paper therefore examines the factors influencing persistent malnutrition among children under-five years in Karamoja region

Key words: *Malnutrition, Children, Moroto district*

Introduction

Malnutrition refers to a pathological state resulting from a relative or absolute deficiency or excess of one or more essential nutrients. It is a state of nutrition where the weight for age, height for age and weight for height indices are below -2 Z-score of the World Health Organization reference. Malnutrition continues to remain a global health problem and policy challenge especially for Sub Sahara African countries including Uganda. World Health organization (2013) reported that, there are 178 million children malnourished across the globe and at any given moment, 20 million are suffering from the most severe form of malnutrition. Nartey et al, (2015) believes that malnutrition remains an important risk factor for the burden of disease causing about 52.5% illness and death among young children globally. On the other hand, Mengistu, (2013) reported that health and physical consequences of prolonged states of malnourishment among children are: delay in their physical growth and motor development; lower intellectual quotient (IQ), greater behavioral problems and deficient social skills; susceptibility to contracting diseases.

Coupled with the burden of deaths resulting from malnutrition, it is estimated that over half of childhood deaths in developing countries is attributed to just mild and moderate malnutrition, varying from 45% for deaths due to measles to 61% for deaths due to diarrhea.

Mengistu (2013). Many studies on child nutritional status across the globe have reported that, the prevalence of malnutrition among under-five children are associated with socioeconomic, health related, demographic and cultural factors.

Literature Review

According to UNICEF (2005), Malnutrition remains one of the most common causes of morbidity and mortality among children under five children throughout the World . Worldwide, over 10 million children under the age of 5 years die every year from preventable and treatable illnesses despite effective health interventions. Sifah et al (2015), believes that approximately 52.5% of illness and death among young children globally is associated with malnutrition. In 2013 alone, malnutrition was the most important risk factor for illness and death among under-fives, of 161 million children who were estimated to be stunted in 2013 globally, over a third of them resided in Africa.

Kabahenda, (2006) reports that Uganda experiences high levels of childhood undernutrition and a number of studies carried out suggest that malnutrition is a problem across the country. Uganda Ministry of Health, (2010) defined malnutrition among children under-five as a result of deficiency of proteins, energy, minerals and vitamins leading to loss of body fats and muscle tissues.

Magnitude of the problem

Nutrition play an important role in the human health and socioeconomic development of any country. However, malnutrition affects human capital development and productivity. Poor nutrition during the first 1,000 days—from pregnancy through a child's second birthday—causes life-long and irreversible damage, with consequences at individual, community, and national levels and the worst outcome of the malnutrition is increased risk of death. Lundgren and Uhrenfeldt, (2014) reported that, globally there are 165 million stunted children (i.e. low height-for-age) due to chronic illness and poor diet and 52 million children are wasted (i.e. low weight-for-height). They believe that these children have an increased risk of Sever Acute Malnutrition (SAM) and death. Although the prevalence of underweight, stunting and wasting among children under-five years of age worldwide has decreased since 1990, overall progress is insufficient and millions of children remain at risk (UNICEF, WHO & WB, 2012).

In developing countries, the proportion of underweight children declined from 28 per cent to 17 per cent between 1990 and 2011 respectively.

Armstrong estimated that the number of undernourished (low weight for age) people of all ages in sub-Saharan Africa increased from about 90 million in 1970 to 225 million in 2008, and was projected to add another 100 million by 2015, even before the current world food price hikes. However, In Uganda, Child malnutrition is one of the major public health challenge and according to Uganda Demographic Health Survey, (2006), reported that 360,000 children (6% nationally) were estimated to be acutely malnourished and nearly 125,000 (2%) of them had severely acute malnutrition. It further revealed that malnutrition is a direct cause of 35% of all under 5 years' mortality (reference) and hence the urgency to prevent and address the problem. Severe wasting in children under 5 years in particular is associated with a 9-fold increased odd of mortality compared to a healthy child.

USAID-SPRING, (2014) reports that children aged between 6-59 month living within Karamoja region with anemia were standing at 69.5% compared to the national target 50.0%, stunting under-five stood at 45% compared to the national target of 32%, underweight for children under-five was at 31.9% compared to national target of 10.0% therefore, the region has highest level of malnutrition prevalence in country compared to other regions.

UNICEF & WFP, (2016) report stresses that, the overall prevalence of Global Acute Malnutrition (GAM) among children aged 6-9 months was at 12.4%. However, WHO standard malnutrition cut-off points, "critical' GAM prevalence observed in Napak was at (16.3%) whereas the other districts fall under the 'serious level' ranging between (10-14%) and the prevalence of stunting reported remained 'very high' at 40% above WHO standards in most of districts, with peaks (both in terms of absolute values and trends from previous surveys) observed in Kaabong, Moroto and Nakapiripirit

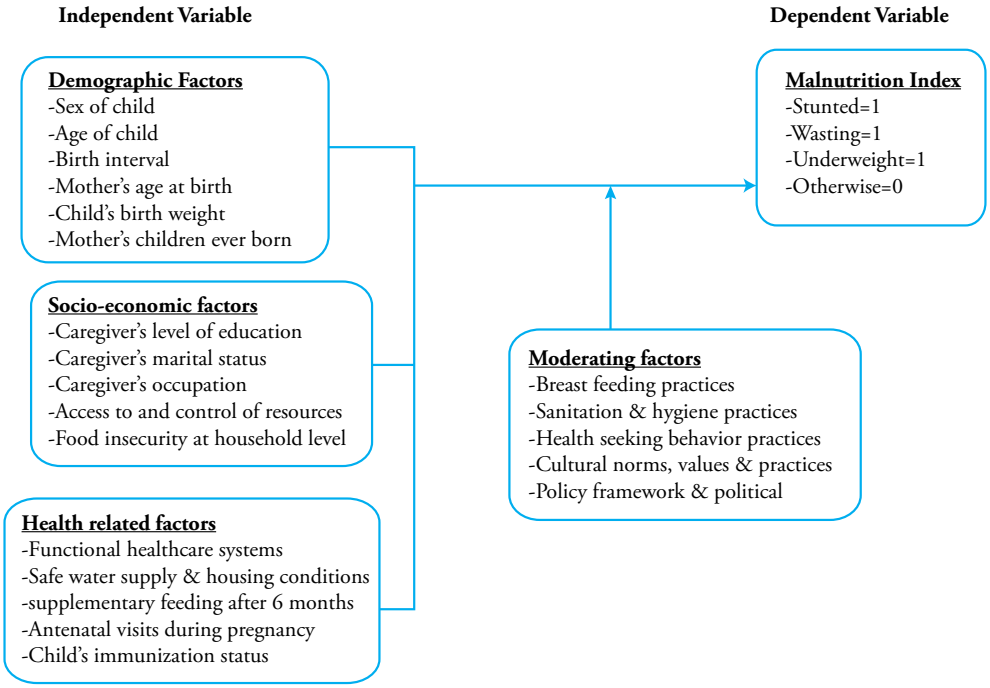
Classification of Malnutrition

Skolin, (2010) identified various conditions of child malnutrition based on energy- and protein intake and lack of or inadequacy of any results into marasmus and Kwashiorkor. Inadequate of energy caused by prolonged starvation results into marasmus where the patients suffer from low body weight in relation to the length. Because of the absence of subcutaneous fat and atrophied muscle, skeleton, pelvis and ribs emerge. Upper arms, thighs and buttocks are very thin. Peripheral edema in lower legs and feet can occur. On the other hand, Kwashiorkor is a caused by a diet that is low in protein. The protein deficiency gives rise to hypoalbuminemia, which comprises a very low level of albumin in the blood. Due to osmotic action, hypoalbuminemia causes peripheral edema and ascites (accumulation of fluid in the peritoneal cavity). Adipose tissue (body fat) and muscle tissue are relatively well preserved; therefore, the patient does not look emaciated

Research Framework

Research framework adopted from (UNICEF, 1998) with modification shows the relationship between independent and dependent variables with intervening factors (practices) which in developing countries particularly in Uganda are believed to be responsible for malnutrition among children under-five. All demographic and socio-economic factors exist within a given environmental context and are believed to influence individual breasting feeding practices, health seeking behavior and sanitation and hygiene. According to Komakech, (2010), feeding practices are result of food insecurity which brings inadequacy of dietary intake that reduces the body's ability to fight infection and hence contributes to increased incidence, severity and length of infections and the symptoms that accompany infections, such as loss of appetite, and fever, lead to reduced food intake, mal-absorption, nutrient loss, and altered metabolism, leads to weight loss, growth faltering, and further weakening of the immune system.

Research Framework showing determinants of malnutrition among children under five years



Source: Adopted with modification from UNICEF on malnutrition, (1998) and Kebede et al. (2013)

Research Design

Mixed methods (quantitative and qualitative) with descriptive survey design was adopted and 234 Children aged 0-59 month were assessed to determine factors influencing malnutrition among children under-five

Data collection methods and tools

Data was collected by use of structured questionnaires to interview 176 biological and caregiver using simple random sampling technique. Anthropometric measurements were captured by use of Mid-Upper Arm Circumference tape whereas weight and height were captured by use of weight machine and height board. Data was captured using smartphone supported by Open Data Kit (ODK) software and it was exported to Stata software for analysis. Then after, sex, age, height, and weight transferred with HHs number to Emergency Nutrition Assessment for SMART 2007software to convert nutritional data into Z-scores of the indices; Height-for-age, weight-for-height and weight-for-age. Multivariate logistic regression was used to identify associated factors of malnutrition.

Analysis and presentation of findings

The findings relate to the study research questions and hypotheses that guided the study. Data were analyzed to identify, describe and explore the factors influencing persistent malnutrition among children under-five years in Moroto district. The study analysis framework was guided by the study objectives, hypotheses and the research questions, and this was carried out in three different form; Univariate/ Descriptive analysis, Bivariate analysis and Multivariate analysis with the main objective of exploring the factors influencing persistent malnutrition among children under-five years in Moroto district.

Child's Demographic Characteristics

A total of 234 children below five years (between 0-59 Months) were involved in the study and according to the analysis, 113(48.3%) were female and 121 (51.7%), were male. The mean age of children was 30.41 with SD of 14.4. In the further analysis, only 20.5% of children were below seven months. Regarding to child weight at birth, 214 (91.4%) were born with normal birth weight i.e. (between 2.5 to 4.2 Kilogram (Table 1). In addition, four out of nine children (45.3%) were of birth order 1-2 with a few children in the birth order of 3-4 (26.9%) and 5+ order (27.8%) respectively. Most of the mothers/caregivers interviewed, (81.9%) gave birth to more than one child, and others approximately 27.2% had given birth to more than two children. In respect of place of delivery, the results indicate that, majority 147(62.8%) were delivered at public health facilities (government aided) whereas 7.7% were delivered from private health facilities and 69 (29.5%) were delivered from home assisted by Traditional Birth Attendant (TBA).

In the further analysis, the survey results indicate that maternal age at first birth (mean age) was 19.58 with SD of 3.21. Accordingly, majority of mothers/caregivers had their first birth while aged between 19 to 24 years 124(53.5%), and only 2(0.9%) mothers gave birth aged 30 years and above. Considerably, a significant proportion of 93(40.1%) children were born when the mothers were less than 19 years of age at birth. According to the child's birth interval, the results indicate that majority of children, approximately 167(71.8%), had their birth interval of two years which implies that child's breastfeeding practices was affected by weaning off breast milk early to give a room for the mother to take care of a possible new pregnancy.

Table 1: Child Demographic Characteristics

Variables	Categories	Frequency	Percentage (%)
Gender of Child	Females	113	48.3
	Males	121	51.7
	6 to 17 Months	48	20.5
	18 to 29 Months	70	29.9
	30 to 41 Months	61	26.1
	42 to 53 Months	41	17.5
	54 to 59 Months	14	5.9
Child Birth Weight	Low Birth Weight	20	8.6
	Normal Birth Weight	214	91.4
Child Birth Order	1-2 Child	106	45.3
	3-4 Child	63	26.9
	5-6 Child	65	27.8
Mother's Children Ever Born	1	21	9.1
	2	148	63.8
	3	63	27.2
Mother's Age at Birth	Less than 19 Years	93	40.1
	19 to 24 Years	124	53.5
	25 to 29 Years	13	5.6
	30 Years and Above	2	0.9

Maternal Socio-Economic Characteristics

As noted by Uganda demographic and health survey, (2016) that the prevalence of stunting decreases with increasing levels of the mother's education, the results from this survey in the table 2 below indicates that, 89(38.0%) of the mothers/caregiver respondents had not attained any form of education that will give them skills to empower them economically and only 59 (25.2%) attained primary school education level while 86(36.8%) completed secondary school education. There were no respondents that attained either tertiary or University education level. In terms of marital status, 69(29.5%) of the respondents were married while 115(49.1%) were not married and 56(23.9%) had a partner (Cohabiting) whereas 50(21.4%), were separated or divorced. The occupation of the respondents was reported that, approximately 98(41.9%) of the mothers reported staying at home as house wives while other mothers, about 34.2% were engaged in petty businesses as their occupation and 52(22.2%) were practicing agriculture as peasants/farmers. In the further analysis, it came out that a significant figure 60 (25.6%) of the households were facing food insecurity at household level.

Table 2: Child Demographic Characteristics

Child Maternal Factors	Categories	Frequency	Percentage (%)
	Never Married	59	25.2
	Married	69	29.5
	Divorced/Separated	50	21.4
	Cohabiting	56	23.9
Education Level	None	89	38.0
	Primary (P1-P7)	59	25.2
	Secondary (S1-S6)	86	36.8
Occupation	House Wife	98	41.9
	Peasant/Farmer	52	22.2
	Petty Business	80	34.2
	Unemployed	4	1.7
Food Insecurity at Household Level			
Household with food Insecurity	No	60	25.6
	Yes	174	74.4

Characteristics of Child's care practices

As indicated in the table 3 below, 94(40.2%) of children were initiated to supplementary foods before age of 6 months and 89 (38.0%) of children were initiated to breastfeeding practice immediately after birth (within first hour of birth). In addition to initiation, 145(62.0%) were not able to do so due to some circumstances (reasons) such as; HIV patients (56.0%), being sick after delivery (37.4%), and/or advised by doctors not breast feed immediately (6.6%). Mothers who were still breast feeding prior to the study were 172(73.5%) and 136(58.1%) mothers were supplementing their children with other foods. The survey further investigated whether mothers knew importance of exclusive breastfeeding and the results have shown that, majority 230(98.3%) of the mothers agreed that exclusive breast feeding is important to a child's growth and health. Concerning immunization status and vitamin A supplementation, all the 234 children in study were immunized with Measles, Bacilli Chalmette-Guerin (BCG), Polio, and DPT vaccines. With regards to confirmation using the Expanded Programme on Immunization Card (EPI Card), a significant number of 42(17.9%) children were not immunized, despite that 192(82.1%) were fully immunized. Of the 234 children, 201(85.9%) had received the most recent Vitamin A supplement administration according to their EPI cards, despite a significant 12.8 percent not receiving the most recent Vitamin A supplementation.

Table 3: Characteristics of Child's care practices

Variables	Categories	Frequency	Percentage (%)
Supplementary Foods before 6 Months	No	140	59.8
	Yes	94	40.2
Initiated Breast Feeding	No	145	62.0
	Yes	89	38.0
Still Breast Feeding	No	62	26.5
	Yes	172	73.5
Importance of Exclusive Breast Feeding	No	4	1.7
	Yes	230	98.3
Given any Supplement	No	98	41.9
	Yes	136	58.1
Main Water Supply	Borehole Water Supply	205	87.6
	Unsafe Water Supply	29	12.4
Housing Condition	Grass Thatched House	206	88.0
	Semi-Permanent Structure	28	11.9
Child Immunization Status			
	Immunized (With Card)	192	82.1
	Vitamin A (Most Recent)	201	85.9
	Measles Vaccination	234	100
	BCG Vaccination	234	100
	Polio Vaccination	234	100
	DPT Vaccination	234	100
ANC Visit Times	2	33	14.1
	3	18	7.7
	4	183	78.2

Environmental Health Characteristics of Households

In terms of environmental Health Characteristics of Households, the survey revealed that majority of respondents 205(87.6%) use borehole water which is considered as safe water followed by Piped Water with (2.8%). A significant figure of 29(12.4%) use un-safe water such as surface water (12.6%), Shallow well (2.4%), Sand dug well (2.0%), and Open well (1.6%). On the other hand, the housing condition for the visited households was grass thatched housing (88.0%).

In the further analysis, the results indicate that Cultural norms and values play a bigger part in African community settings because approximately, majority of respondents 185(79.1%) indicated that they wouldn't use latrine in households even if they were constructed for norms and values they subscribe into such as; they do not like the smell of the latrine (36.2%), they do not like sharing with in-laws (20.3%), they would use far bush (18.2%), they believe open defecating faeces dry up easily (10.1%), they fear in falling into the latrine (7.1%), they fear aborting pregnancy (5.5%), and lastly they fear contracting diseases (2.5%).

According to there was an attachment refusing people of Moroto from using latrines, even if they were constructed 185(79.1%). This is further witnessed by the big percentage of households that said, they would not use a constructed within their household, 122(52.1%), and reasons included; do not like

the smell of the latrine (36.2%), do not share with in-laws (20.3%), using the far bush (18.2%), open defecating faeces dry up easily (10.1%), fear falling into the latrine (7.1%), fear aborting pregnancy (5.5%), and lastly contraction of diseases (2.5%). In general terms, majority of the household had no latrines as they use open defecation. A few of respondents that had constructed latrines, they had no hand washing facilities approximately 88.5% and hand washing soap with 91.0% respectively.

Table 4: Environmental Health Characteristics of Households

Variables	Categories	Frequency	Percentage (%)
Would use Latrine if constructed	No	122	52.1
	Yes	112	47.9
Is there Attached Cultural Norms and Values Using Latrine	No	49	20.9
	Yes	185	79.1
Is there Hand Washing Facility at latrine	No	207	88.5
	Yes	27	11.5
Is there Hand Washing facility with Soap at latrine	No	213	91.0
	Yes	21	9.0

Prevalence of Malnutrition Among Children Aged 6-59 Months

The overall prevalence of malnutrition of children among aged 6-59 months in the study area were 34.5% stunted, 27.9% were underweight and 13.4% were wasted. The highest prevalence of malnutrition of children aged 6-59 months were seen in males (Table 5). In terms of age groups, the highest prevalence of stunting was observed in in children aged 18-29 months with 50.0% followed by children aged 30-41 months with 35.0%. However, the lowest prevalence of stunting was observed in children aged 6-17 months with 17.0% (Table 6). In the further analysis, the highest prevalence of underweight was observed in children aged 18-29 months with 35.7% followed by children aged 30-41 months with 30.0%. These findings are higher than the Uganda national figures of stunting at 29% but the results of underweight were same as those of UDHS, 2016 which stated that highest percentages of underweight and wasted children were observed in Karamoja sub region standing at 26% and 10% respectively. On the other hand, highest prevalence of wasting was observed in children aged 6-17 months with 23.4% followed by children aged 17-29 months and 41-53 months with 12.9 % and 5.2% respectively.

Table 5: Prevalence of Malnutrition of Children (6-59 Months) in Moroto

Malnutrition Status	Overall Status (%)	Girls (n=112)	Boys (n=120)
Stunting	34.5%	30(26.8%)	50(41.7%)
Under Weight	27.9%	27(24.1%)	38(31.4%)
Wasting	13.4%	12(10.7%)	19(15.8%)

Factors Associated with Malnutrition of Children

In reference to the table 5 above, the analysis showed that from a total of 234 children in the study, out of 112 female children, 30(26.8%) were stunted, 27(24.1%) underweight, and 12(10.7%) wasted, whereas out of 120 male children, 50(41.7%) were stunted, 38(31.4%) underweight, and 19(15.8%) wasted. Male children were more malnourished than girls.

Using bi-variate analysis, table 6 below indicates that child age, child gender, those mothers that decided what food to eat at home, and what crops to plant during season, households that used constructed latrines, households with washing facilities and soap were found to be statistically and significantly associated with chronic malnutrition (stunting). Findings on gender from this study were in line with findings from Botswana which also found that Malnutrition was significantly ($p < 0.01$) higher among

boys than among girls (Salah, Maria and Bandeke, 2006). Age of a child was revealed as statistically and significantly associated with stunting (p=0.006) at 95% level of significance though it was not associated with underweight (p=0.263) and wasting (p=0.204) were found not be statistically significant. In further analysis, the majority of the children found to be stunted, wasted and underweight were found to be within the age between 18 to 29 months.

Children born to mothers with more than one child were found to be at a higher risk of being stunted, wasted and underweight, while children falling within the birth order of 1-2 rang were also highly stunted, wasted and underweight than others. Furthermore, children within the birth interval of 1 to 2 years were found to be highly stunted, wasted, and underweight, and since these do not breast feed well as the mothers are preparing for the new born. Children born to mothers that had given birth between 19 to 24 years were found to be highly risk of being stunted, wasted and underweight as compared to other mothers within the different age at birth categories. Mothers within 25 years of age and above at birth were at lower risk of being stunted, wasted and underweight.

Regarding child maternal factors, it was revealed that wasting was statistically significant (p=0.015). children from household whose mother was divorced/separated had high risk of being stunted, wasted and underweight children as majority children who were malnourished were stunted 46.9%, wasted 40.0%, and underweight 26.5%). In addition, educational level of the child's mother and occupation were not associated with stunting, wasting and underweight though children from mothers with higher educational level that is secondary level were found to be at a low level of stunting, wasting and underweight than other children whose mothers attainted only primary or never had any formal education as this category of children were highly stunted and wasted. Majority of the children whose mothers were house wives and those doing petty businesses were found to be highly stunted, wasted and underweight than children whose mothers practice agriculture thus peasant/farmers.

Having the authority to decide or making the decision on which type of food to eat at home (p=0.031, and which type of plants to be planted during a season (p=0.040) were statistically significant with stunting. On the other hand, cultural practices such as not using latrines/toilets because of attached cultural norms was statistically significant with stunting thus having an association with malnutrition of a child. It was revealed that children living in households with no hand washing facilities were highly malnourished (stunted, wasted and underweight) than other children, and this was further satisfied with the fact that this was statistically significant with stunting (p-value, 0.014) and wasting (p-value, 0.041), therefore hand washing facilities were associated with malnutrition.

On the breast-feeding practices such as; child still breast feeding at the time of survey, whether child was exclusively breastfed up to 6 months and whether breastfeeding was based on demand or frequently were found not associated with malnutrition. However, children who were breast fed frequently and when on demand were found to be highly malnourished (stunted, wasted and underweight) compared to children who were breast fed only when their mothers were not busy. Additionally, children who were not exclusively breastfeeding were found to be highly stunted and underweight than those on exclusively breast feeding, even though mothers who were still breast feeding were found to have highly malnourished (stunted, wasted and underweight) children.

Table 5: Bi-variate analysis between the dependent variable (Malnutrition) and the Explanatory variables

Variable	Category	Stunting		Under Weight		Wasting	
		Stunted, n (%)	P-value	Under weight, n (%)	P-value	Wasted, n (%)	P-value
Gender of Child			0.017*		0.215		0.252
	Females	30(26.8)		27(24.1)		12(10.7)	
	Males	50(41.7)		38(31.4)		19(15.8)	
Age of Child (Months)			0.006**		0.263		0.204
	6 to 17 Months	8(17.0)		11(22.9)		11(23.4)	
	18 to 29 Months	35(50.0)		25(35.7)		9(12.9)	
	30 to 41 Months	21(35.0)		18(30.0)		5(8.3)	
	42 to 53 Months	12(29.3)		7(17.1)		5(12.2)	
	54 to 59 Months	4(28.6)		4(28.6)		1(7.1)	
Child Birth Weight			0.127		0.826		0.361
	Low Birth Weight	10(50.0)		6(30.0)		4(20.0)	
	Normal Birth Weight	70(33.0)		59(27.7)		27(12.7)	
Child Birth Order			0.131		0.641		0.827
	1-2 Child	35(33.3)		30(28.3)		15(14.3)	
	3-4 Child	17(27.0)		15(23.8)		7(11.1)	
	5-6 Child	28(43.6)		20(31.3)		9(14.1)	
			0.881		0.476		0.207
	Less than 1 Year	3(42.9)		3(42.9)		1(14.3)	
	1 to 2 Years	57(34.6)		48(28.9)		26(15.8)	
	3 to 4 Years	20(33.3)		14(23.3)		4(6.7)	
Mother's Children Ever Born			0.176		0.464		0.131
	1	11(52.4)		8(38.1)		5(23.8)	
	2	50(34.3)		38(25.9)		15(10.3)	
	3	19(30.2)		19(30.2)		11(17.5)	
			0.509		0.521		0.322
	Less than 19 Years	28(30.4)		25(27.2)		8(8.7)	
	19 to 24 Years	48(38.7)		38(30.7)		21(17.0)	
	25 to 29 Years	3(25.0)		2(15.4)		12(16.7)	
	30 Years and Above	1(50.0)		0(0.0)		0(0.0)	
Marital Status			0.201		0.142		0.015*
	Never Married	18(30.5)		13(22.0)		8(13.6)	
	Married	23(33.3)		16(23.2)		5(7.3)	
	Divorced/Separated	23(46.9)		20(40.0)		13(26.5)	
	Cohabiting	16(29.1)		16(29.1)		5(9.1)	
Education Level			0.745		0.686		0.517
	None	31(34.8)		24(27.0)		9(10.1)	
	Primary (P1-P7)	22(37.9)		19(32.2)		9(15.5)	
	Secondary (S1-S6)	27(31.8)		22(25.9)		13(15.3)	
Occupation		0.311		0.874		0.512	
	House Wife	36(36.7)		28(28.6)		10(10.2)	
	Peasant/Farmer	12(23.5)		12(23.5)		8(15.7)	
	Petty Business	31(38.8)		24(30.0)		12(15.0)	
	Unemployed	1(33.3)		1(25.0)		1(33.3)	
Food to Eat at Home			0.031*		0.296		0.665
	Husband	0(0.0)		1(9.1)		1(9.1)	
	Jointly	12(28.6)		10(23.8)		4(9.5)	
	Myself	47(37.6)		37(29.6)		18(14.4)	
Plant during Season			0.040*		0.354		0.520
	Husband	0(0.0)		1(9.1)		1(9.1)	
	Jointly	28(32.6)		23(26.7)		9(10.5)	
	Myself	31(38.3)		24(29.6)		13(16.1)	

	Husband	0(0.0)		1(9.1)		1(9.1)	
	Jointly	28(32.6)		23(26.7)		9(10.5)	
	Myself	31(38.3)		24(29.6)		13(16.1)	
Using Constructed a Latrine			0.033*		0.375		
	No	34(28.1)		31(25.4)		17(14.1)	0.748
	Yes	46(41.4)		34(30.6)		14(12.6)	
Cultural Norms			0.448		0.346		0.730
	No	14(29.8)		16(33.3)		7(14.9)	
	Yes	66(35.7)		49(26.5)		24(12.9)	
Hand Washing Facilities			0.014*		0.260		0.041*
	No	65(31.7)		55(26.7)		24(11.7)	
	Yes	15(55.6)		10(37.0)		7(25.9)	
Hand Washing Facilities with Soap			0.070*		0.275		0.032*
	No	69(32.7)		57(26.9)		25(11.85)	
	Yes	11(52.4)		8(38.1)		6(28.6)	
Still Breast Feeding			0.667		0.816		0.901
	No	20(32.3)		18(29.0)		8(12.9)	
	Yes	60(35.3)		47(27.5)		23(13.5)	
Exclusive Breast Feeding			0.085		0.320		0.428
	No	3(75.0)		2(50.0)		0(0.0)	
	Yes	77(33.8)		63(27.5)		13(16.6)	
When to Breast Feeding	On Demand	35(33.7)		25(24.0)		17(16.4)	
	Frequently	30(40.0)		25(33.3)		9(12.0)	
	When not Busy	15(28.3)		15(27.8)		5(9.4)	

Conclusion & Recommendation

This study indicated that prevalence of malnutrition was high and it tops list of challenges the district is grappling with. The prevalence statistics in this study were higher than national and regional figures found from UDHS (2016). According to the findings, stunting was at (34.5%), underweight at 27.9%, and wasting at 13.4% respectively. Majority of the mothers/caregivers were house wives (41.9%) and doing petty businesses (34.2%). 89(38.0%) never attained any formal education. Most of visited households had a problem of food insecurity since these never had enough food, with majority 91(52.3%) resorting to one meal a day. Concerning cultural norms and values, 69.7% of the visited households were not using latrines, instead they were using the bush and open defecation was the most practiced method (93.3%). At the bi-variate analysis, it was observed that factors such as gender of child, age of child (months), maternal marital status, maternal decision on what food to eat at home and crops to plant in a season, cultural norms that is use of a latrine, and having hand washing facilities with or without soap were all found to be statistically significant therefore having an association/ relationship with malnutrition of children under five years of age. Children staying with divorced/separated mothers, cultural norms and values of not using the latrines that is; open defecation, dig and burry among others, were the only significant factors to malnutrition in Moroto district.

Recommendations

The study recommends that in situation where results revealed that in households where women involved in decision making especially in matters of food to eat at home, what to plant during planting season had statistical significance in malnutrition status of child, therefore, there is need to create a massive awareness about the involvement of women in cores of the family management and break the patriarch analogy of Karamojong societal settings

It was also found out that, cultural norms such open defecation had significant association with malnutrition of children in Moroto therefore, it is recommended that such norms need to be dealt with through behavior change communication strategies by any intervention intended to reduce malnutrition.

It is also recommended that ministry of health and other organization working on child survival interventions in Karamoja should integrate water, sanitation and hygiene strategies with infant, young and child feeding (IYCF) intervention to equip mothers with knowledge and skills on hygiene, prevention of diarrhoea and water treatment with the aim of lowering diarrhoea case.

It was found out that in household which experienced food shortage and reduced meals per day as some coping strategies has high risk of malnutrition for the children, it is recommended that agro-pastorialism diversification strategies such as kitchen gardening need to be encourage among Karamojong with intention to improve access to vegetables and fruits which will in turn improve micronutrient intake and dietary diversity of the children.

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