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Nutritional Status of Children Under-five Years and the Associated Factors in Mwanamukia Nairobi Metropolis.

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Abstract

Children under five years of age can be permanently disabled by the physical and mental effects of inadequate dietary intake in the earliest months of life. Physical growth, motor and cognitive development of children requires progressive changes in size. Children require adequate nutritious dietary intake in order to enhance this important function of growth and development. This was a cross-sectional descriptive survey and the objectives were to find out the nutritional status and associated factors of children under-five years in Mwanamukia of Kasarani Sub-County of Nairobi County. Structured questionnaire was used to gather information on the demographic, socio-economic and child caring practice. Anthropometric measurement was used to collect height, weight and MUAC following the standard measurement tools and procedures. The study found that majority of children 43% were severely stunted and 27% were normal. 43% were underweight and 26% had normal weight. Severe wasting had 20% 50.3% were normal. Children at the age of 36-47 months were more likely to be stunted (<-3 Z scores) than the younger children while children aged 0-6 months had achieved normal nutritional status. The study found low dietary diversity score were achieved by children under-five (58% (<4 food groups), 23% had medium scores (4-8 food groups), while 19% had high scores (6-8 food groups). The most consumed food groups were cereals (79%) and legumes (10%), while the least consumed was meat at (0.2%). The children had majority of them (82%) consuming only one meal per day and only (6.6%) of children consumed three meals per day. The risk of stunting was 5.343 times higher in children who did not meet minimum dietary diversity. Similarly the risk of stunting was higher (OR=2.421 Ci =1.340-10.346 PV= 0.003) in children who did not receive minimum times of meal in comparison to children who got minimum times of meal per day which is three times. The mothers' education had majority who attained primary level at 44.6% and only 8% were illiterate, while 34.6% had attained 0'level education and a minority 0.8% had attained University education. Children with minimum dietary diversity were stunted P.V =0.003. The occupation of mothers had majority 28.6% were running small businesses and 21.2% were farmers and probably practicing urban agriculture. The monthly income of mothers had the highest number of respondents earning KES 11000-20000and the lowest group earning KES 1000-10000 per month a whopping 68% had an income of KES 30000 per month. The study found no significance difference between the nutritional status of children and the household socio-economic status, age of mothers, educational level and occupation PV=0.003. The study shows that there is high prevalence of stunting and under-weight in children under-five years. There was also low dietary diversity and low food consumption frequency. The households where these children reside had large household sizes. Stunting had statically significant association with low dietary diversity and underweight had a statistically significant relationship with size of the household number. In this study it appears that family size, food consumption frequency, dietary diversity, maternal health seeking behavior during pregnancy, exclusive breast feeding and time of giving complementary feeds are the most significant determinants of malnutrition among children under-five years.

Key words: Associated factors; nutritional status; children under five years.

Back Ground Information.

Nutritional status of children under five is a major indicator of food security in the population. It is also an indicator of child survival. Malnutrition is a major public health problem that affects most people in developing countries and occurs prominently among children under five years of age (Haile and Amboma, 2018). Adequate nutrition is essential in early childhood to ensure healthy growth, proper organ formation and function, a strong immune system and neurological and cognitive development. Economic growth and human development require well- nourished populations who can learn new skills, think critically and contribute to their communities, WHO, UNICEF, 2011).

Malnutrition in lactating mothers and children under five years is a major problem, in informer settlements areas of urban centers and this is necessitated by various underlying factors which ought to be addressed multsectorally in-order to curb health and malnutrition problems in the urban informer settlements of developing countries (Nkirigacha *et al*,2016). Every year 7.6 million children die of such preventable malnutrition and their related causes. The other cause of dead in infants which is also preventable is low birth weight which leads to intergeneration cycle of malnutrition in population especially in females (Sibanyoni and Tabit,2017, unicef, 2014).

Early weaning, late weaning, poverty and food insecurity are the major socio-cultural factors that lead to malnutrition in children under five years in developing countries (Nkirigacha *et al*., 2016). Childhood nutrition determines the future nutritional status of an individual, so that once there is poor nutritional status at childhood it will directly impact on adulthood nutritional status (Jennifer and Amy,2017).

Nutrition is an important determinant of immunological status. Under nutrition can make poorer immune competence and increase chances of susceptibility and vulnerability to infections. Inadequate dietary intake and episodes of diarrheal and respiratory diseases are the immediate causes of malnutrition and high mortality rate in children under five years (Erin *et al.,* 2017)

Children under five years of age can be permanently disabled by physical and mental effects of inadequate dietary intake in the earlier months of life. About 2.2 million deaths of under-five children occur due to stunting, severe wasting, and Intrauterine Growth Restriction (IUGR). Improving infant and young child feeding practices in children aged 0-23 months is critical to improving nutrition, health and development of children (WHO, 2008).

The consequences of hidden hunger which includes mild-to moderate malnutrition especially chronic under nutrition originating from micronutrients is not always visible but have significant effects on mortality, educability and the future productivity of children. Numerous meta-analysis have provided evidence of the many consequences of under-nutrition in children below five years (Norman, *et al*., 2016, Lkline *et al*., 2017).

Physical growth, cognitive development of children requires progressive changes in size, as well as accompanying changes in skills and behavior (Hungo *et al.*,2012, Norman *et al*., 2016, Rolfers *et al*., 2016).children require adequate nutrition in order to enhance this important function of growth and development. This could be achieved if children are breastfed exclusively for at least 4-6 months after birth without introducing early complementary feeding and lactating mother use quality diets (Caballero *et al*., 2017, Nkirigacha *et al*., 2016).

In community nutrition settings growth of infants and young children is measured by assessing weight and length/height, Mid Arm Circumference (MUAC) and head circumference. Normal growth patterns from birth to adulthood vary between individuals owing to differences in bodily proportion and composition, including the timing of growth spurts. All infants demonstrate accelerations and decelerations in growth in response to changes in their environment or because of illness. The environment includes the nutrition status of the home the child is growing into. During illness, even a quite mild one, growth tends to slow down, but if the child is receiving adequate nutrition, this slow-down is followed by catch-up growth which consequently restores

normal growth curve (Norman *et al*,. 2016, Walker *et al*.,2011). However if the cause of the delayed growth lasts for a long period of time, catch-up growth may never completely take place (Norman *et al*., 2016, Walker *et al*.,2011).

The most dramatic period of child growth velocity is between birth and 4 months of age. Many full-term infants lose some weight shortly after birth, which they regain by day 8 to day 10 (Loretal, 2014, Norman *et al*., 2016). Thereafter, the average weight gain during the first year of life is 7 kilograms of which about half is gained in the first 4 months at a rate of 200 grams per week. This is followed by an average weight increase of 2 to 4 kilograms in each of the next 2 years with average weight gain per week being about 40 grams. Average birth weight babies double their weight by 6 months and treble it by one year of age (Norman *et al*,. 2016, Loretal, 2014). By 4-5 years of age the growth rate stabilizes at an increase of 2 to 4 kilograms per year. Sex differences in weight during pre-school years are slight, but after 2 years of age girls tend to have higher adipose tissue as evidence in skinfold measurement (Norman *et al.,* 2016).

Children who start fat development earlier are at increased risk of obesity and should be monitored regularly. The average length at birth is 45-53 cm for girls and 46-55 cm for boys (WHO, 2006, Norman *et al*., 2016). Infants usually increase in length by 50% by year one (approximately 25cm) followed by another 12 cm increase between years one and two to double birth length by age 4 and triple it by age 13 (Loretal,2014, Norman *et al*., 2016). During years 3 to 5 there is greatest increase in height relative to weight (Norman *et al*., 2016). All this is dependent on average quality nutrition.

At birth average head circumference is about 35cm and increases by about 47 cm. Measuring head circumference during this period is important because it reflects brain growth and brain doubles its weight by one year of age. From one to two years of age a head grows an average of about 5 cm in circumference, but by age 3 the mean annual increase slows to less than one cm per year (Norman *et al*., 2016).

STUDY AREA

The study area was Kasarani area

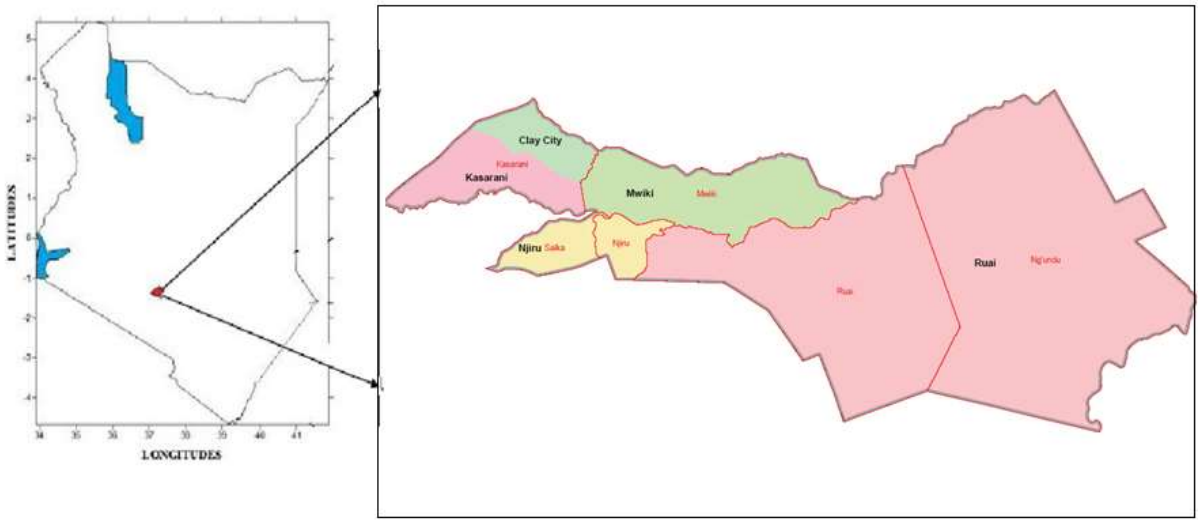


Figure 1.1: Map of Kenya showing Kasarani sub-county showing the study area

Study area and study design

The area of study was Mwanamukia sub-ward, Kasarani ward, Kasarani sub-county. The sub-county has four Wards namely, Kasarani ward, Githurai ward, Ruaraka ward and Roysambu ward. Kasarani ward has 3 sub-wards; Mwiki sub-ward, Clay city sub-ward and Mwanamukia sub-ward. Mwanamukia has two villages namely; Maji-Mazuri village and Gitueko village. Mwanamukia Area is approximately 9 square km^2. The area has a total population of 61,316 with 28,637 males and 32,679 female (G.O.K 2010). The area of study was

selected randomly. With the help of the Assistant chief and headmen the researcher was able to choose villages from which she made a list of households with children under five years.
A cross sectional study targeting children aged 0-59 months was done. The sampling unit was households. The Fischer's formula (Fischer *et al.,* 1991) was used to calculate the sample size. The calculation yielded 236 households. After adding 10% Attrition (24 households) the total became 260 households. The activities going on these households were also noted. Sample size per village was drawn randomly for each village.

Methods
A community based cross-sectional descriptive survey using structured questionnaire and measurements of weight and height to determine the nutritional status of children under five and related factors. It was carried out in Mwanamukia Kasarani Sub-County Nairobi. A sample size of 260 of under five children was taken based on area prevalence of underweight that is 32.9% and with 5% precision at 95% confidence interval.

Sample size calculation
This was based on the formula by Fischer *et al., (*1991): $N= z^2pq/d^2$, where N is the sample size, z is the normal deviation (1.96) corresponding to 95% confidence intervals, p is estimated food insecurity in Nairobi at 32.9% (Urban Health, 2011), q is 1-p and d is the degree of the desired accuracy at 5%. The calculation yielded 236 households, plus 10% attrition gave a total sample of 260 households.
The sampling unit for this study was the household with children 0-59 months of age and the respondents were mothers or the principal caretaker of the index child. One child under five years was selected for the interview in each household since the one gave a true representation of the particular household.

Structured questionnaire was used to gather information on the demographic, socio-economic and child caring practice. Anthropometric measurement was used to collect height, weight and MUAC following the standard measurement tools and procedures. Height and weight of the subjects was taken too. Weight was taken by asking the subjects to be in light clothing then stand on a weighing balance which is calibrated at 0 with legs apart at 25cm. weight was then taken to the nearest 0.1kg (Gibson, 2005). All measurements height and weight were taken twice and the mean value was used for analyses. Where the differences for the two measures were higher than 0.5cm or 0.5kg then a third measure was taken and the mean of the two closest values used in the analyses.

The study units were selected randomly from the list of total children under five in the study population.

- Weight-for-age, weight-for-height and height-for-age z-scores were based on WHO reference data (WHO, 2006). A cut off of 2-z-score was used to define under nutrition for binary lofistic analyzed in SPSS version 20. Information was entered into Epi-info data version 3.1 and anthropometric measurements were converted into Z-SCORE BY WHO Anthro version 3:2:2, 2011 software and Nutri-survey program. Then exported to STATA 13 and analyzed using descriptive and inferential statistics. Three out comes were focused (for each stunting, underweight and wasting). Prevalence are based on the WHO Child Growth Standards (WHO, 2006) median for:
- Stunting- proportion of children with height-for-age below -2SD;
- Underweight-Proportion of children with height-for-age below -2SD;
- Wasting- Proportion of children with weight-for-height below -2SD; and
- Overweight-Proportion of children with weight-for-height above +2SD.

The measure of dietary diversity score of children was based on simple counts of the number of food groups consumed by the child in the past 24 hours preceding the study. Eight food groups recommended by FAO (FAO, 2008) for assessing individual dietary diversity was used. Food consumption was based on asking the number of meals an individual child consumed per day and if there was snacking in between meals. Bi-variate analysis was performed on various selected variables with nutritional indices of the children to determine possible associations. Odds ratio was conducted on those variables with more than two catagories, P-Value >0.05

Results

The nutritional status of children under five by MUAC measurements.

The table1 shows the prevalence of stunting for children. Where the study found out that 43.07% were severely stunted, 30.38% were moderately stunted and 26.53% were normal. Children who were severely underweight were 26.7%, moderate underweight were 31.5%, and normal was 43%. Those with severe wasting were 4.37%, moderate wasting were 2.9% and normal children were 2.73%.

The risk of stunting were 5.342 times (OR=5.423, CI= 1.993 -19.071, P= 0.038), higher in children who did not meet minimum dietary diversity requirement than in children who met.

Similarly risk of stunting is also higher (OR = 2.421, ci = 1.340 – 10.346, p=0.003) in children who did not receive minimum times of meal in comparison to children who got minimum times of meal.

Table 1. Distribution of children by stunting, underweight and waisting.

Nutritional status		Frequency %
1. Stunting		N=260
	Severe stunting	69 (43.07%)
	Moderate stunting	79 (30.38%)
	Normal	112(27.00%)
2. Underweight		
	Severe Underweight	67 (43.0)
	Moderate Underweight	82 (31.5)
	Normal	111(25.76)
1. Wasting		
	Severe wasting	140 (54%)
	Moderate wasting	34%(88)
	Normal	12%(32)

*the figures in parenthesis are percentages.

Education level of the mothers

The education levels of the mothers are shown in Table 3.3. Results show that, 44.6% had primary and 40 % had secondary education. The remaining mothers had either college diploma or university degree. There were 8.1% of illiterate mothers. That means that majority of the mothers participating in the study had at least primary level education. This means that they were all capable of accessing nutrition and health information

from the common sources available. The main education level attained was primary at 44.6 % which is higher than the average of 43% indicated by KDHS study (2014).

Table 2: Distribution of mothers by education level

Education level (N=260)	Number of respondents	Percentage (%)
Illiterate	21	8.1
Primary level	116	44.6
Secondary (O level)	90	34.6
Secondary (A level)	14	5.4
College	17	6.5
University	2	0.8

Stunting of children in relation to feeding practices

Table 2. Stunting of children in relation to child feeding practices.

Survey variables		**OR**	**95% ci FOR or**		**P.Value**	
			Lower	**Upper**		
Minimum Dietary Diversity						
	Not met	5.423	1.993	19.071	0.003	
	Met	-	-	-	-	
Minimum Frequency						
	Not met	2.421	1.340	10.346	0.003	
	Met	-	-	-	-	

Occupation of the mothers

Table 3: Distribution of the mothers by occupation

The occupations of the mothers are shown in Table 3.5 shows; there were many differing occupations among the respondents. Majority were running small businesses mainly in the informal sector at 28.6%, while 23.9% were housewives and 21.2% were farmers, probably practicing urban agriculture

Occupation of the mothers	Number of mothers (N = 260)	Percentage (%)
Business	75	28.6
Housewives	62	23.9
Farmers	55	21.2
Teachers	20	7.8
Hairdresser	17	6.3

Tailor	8	3.1
House help	8	3.1
Laborer	5	2.0
Others	10	4.0

4: Distribution of the mothers' households by monthly income

The monthly income levels of the households in Kenya shillings (KES)* of the households are shown in table 3.6. As the Figure shows, the largest group of households had income of KES 11000 – 20000. About 27% of the families had income of between KES 1,000 – 10,000. These figures show that at least 18% fall within the lower socio-economic group of the country considering reference for cut-off of KES 15000. Also the incomes show that 68% of the households had income of less than KES 30,000 per month, and therefore lived below the World Bank poverty line of $1 a day. It is possible that this number could go down considering that the communities do not necessarily entirely depend on the monetary income especially for food. Much of the food consumed is usually grown by the households under urban agriculture.

Table 5: Distribution of mothers' households by income

Monthly income Categories	Number of respondents	Percentages
20-25 1000 – 10,000	39	27.2
26-30 11,000 – 20,000	103	40.6
31-35 21,000 – 30,000	24	9.4
36-40 31,000 – 60,000	28	10.2
41&above >70,000	25	12.6

Association of children malnutrition and related factors.

Stunting of children in relation to socio-economic, occupation and age of mothers.

The study found no significant difference between the education level of mothers and stunting, and also there was no significant difference between stunting and socio-economic status of mothers at ($r=0.734$ and $p<0.05$).

Table 6: Distribution of children malnutrition (stunting,underweight) and related factors

N=260 Survey variables		OR	95% ci FOR or		P.Value	
			lower	Upper		
Educational level of mothers	No formal education	0.012	0.041	0.061	0.003	
	Primary	0.016	0.070	0.451	0.002	
	Secondary and above	0.473	0.214	0.812	0.024	
Socio-economic status of mothers						
	+500-10,000	6.231	3.563	22.763	0.000	

	11,000 and Above	2.479	0.479	3.651	0.413	
Age of children in months						
0-6	-	-	-	-	-	
7-12		5.231	1.236	27.891	0.0213	
13-24		1.301	0.216	3.471	0.734	
25-36		7.145	1.936	23.321	0.007	
37-48		8.534	1.357	24..107	0.023	
48-59		9.142	1.067	97.213	0.003	

Distribution of maternal care and care giving behavior.

The table shows that majority of mothers (63.1%) did not attend antenatal clinic consistently for last three months before delivery while (39.1%) attended. Majority of mothers initiated breast feeding for the first one hour and least number (63.1%), while 2.5% were not breastfed at all. 64.6% initiated complementary feeding before 6 months some as early as one month while 34.4% did exclusive breastfeeding before introducing complementary feeding. Most mothers breastfed their children for at least two years and above (72.7%).

Table 7: Distribution of children by maternal and caring behavior

		Antenatal visit during		
Variable	N(260)		Percent	
Antenatal	number	Attend (96	36.9	
	124/136	No attend (164 4 (164)	63.1	
		Initiation of breast feeding		
Category	**Number**			**Percent**
Immediately\<1hr	166			63.8
After 1 to 24hr	79			30.3
After 24hr	9			3.4
Not given at all	6			2.5
Total	*260*			100
		Feeding colostrums'		
Category	**Number**			**Percent**
Yes	180			69.2
No	80			30.8
Total	260			100
		Exclusive breastfeeding		
Category	**Number**			**Percent**
Yes	90			34.6

No	170		65.4
Total	260		100
		breast feeding and	
Category	**Number**		**Percent**
Yes >6months	168		64.6
No	92		35.4
Total	260		100
		Duration of breast feeding	
Variable	**Number**		
Duration breast	189		

Analysis of child malnutrition and its associated factors

The table shows the estimated coefficients of explanatory variables along with the 95% confidence interval.

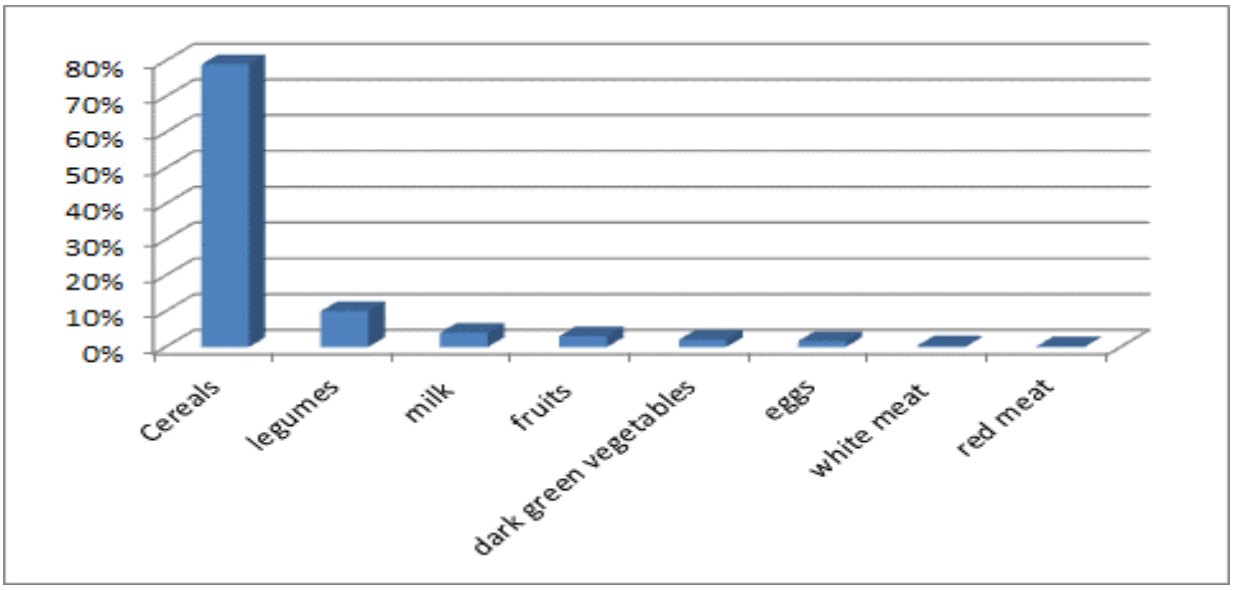
Table 8: Bivariate analysis on malnutrition associated factors.

Indicator of child malnutrition	Explanatory variables	Coefficient	95% CI
		1* (0.56)	-0.03 2.00
	Feeding practice	1.24** (0.57)	0.20 0.29
Wasting	Maternal education No formal	1.73*** (0.64)	0.73 3.18
	Monthly income <1500	1.85*** (0.56)	0.70 2.79
	Exclusive breastfed No	0.36 (3.39)	-0.59) 1.59

****significant at 1%, **significant at 5%, *significant at 10%, unmarked not significant.*

-reference category, the number in the bracket is indicating Standard error, CI-confidence interval.

Figure 1: Distribution of children under-five years by food group consumed in Kenya.



The study found that the most consumed food group was cereals at (79%), then legumes at (10%), followed by milk at 4%, fruits 3%, dark green vegetables 2%, eggs 1.6% and both red and white meat had 0.6%.

Distribution of children under five by number of meals consumed per day.

Distribution of children under-five years by number of meals consumed in Kenya.

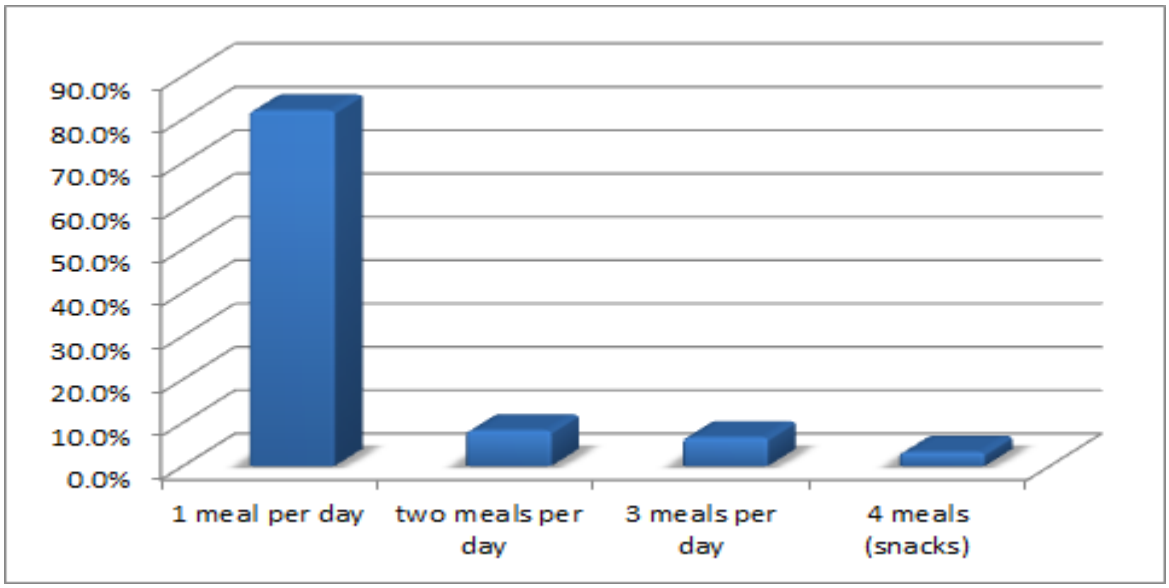


Figure 2: Distribution of children under-five years by number of meals consumed in Kenya.

The study found that majority of children consumed one meal per day (82%), two meals per day (8.2%), 3 meals per day was consumed by (6.6%) and 3.2% consumed at least one snack per day.

Discussions

The study show the prevalence of underweight at 43.0% and prevalence of stunting was 26%. The majority of children under five years of age regarding weight-for-height 43.0% were below -3SD Z-Scores, while 30% were below -2SD z Scores and 27% were below-1SD Scores. This is a public health concern and these children require fast nutritional intervention. This could have been contributed by the number of household members in the study households which had an average of six members and a maximum of twelve members. These numbers are higher than 4 members that are reported by Kenya Demographic Survey (KDHS), (2008). This large number could have been contributed by the fact that the study area is a slum area where majority of

rural population looking for jobs find themselves leading to food availability is challenge due to unemployment. This encoupled with a large household number can lead to the current situation of high number of children under five suffering from severe stunting. Food security, economic or uninterrupted physical access to sufficient food for dietary needs and productive and healthy life, is an important prerequisite for improving the nutrition of vulnerable groups such as women and children (Kathmandu, 2016). This study concurs with a study done in Kapilvastu District, Nepal (Tulsi,2013) which found 30.8% children under-five below -2SD, however the same study found a lower percentage of (25%) of children under-five at -3SD. The relationship between weight for height of the children under five years in the study was statistically significant($r=0.755$ and $p<0.05$). Regarding weight-for-age of children under five years had 43% -3SD Z scores and 31.5% had below -2SD Z scores. Height-for-age had 20% below <-3SD Z-score of the children under five years, 29% had below <-2 SD Z-scores. The height-for-age of children had statistically significant relationship r(0.775 and $p<0.05$). This study contradicts with a study done in Kibera Nairobi (Olack *et al.,* 2011) which revealed that stunting had a prevalence of 47.0% and a severe stunting of 58.0%. The study area could have had a low prevalence of severe stunting but it is still at an alarming stage and nutritional intervention is necessary in the area. This could include the most viable one in the rural slums which could include planting of vegetables in multistory gardens and organoponics. The vegetables can be used for home consumption as well as sale of the reminder so that other household food items can be bought to improve food security. The prevalence of stunting of 26.0% in the study is slightly lower than that, which was recorded by Kenya Demographic and Health Survey (2008) of 28.5% in Nairobi metropolis. This is because the Kenya Demographic and Health Survey get the data from the entire Nairobi whereas this is from a specific area of Mwanamukia in Kasarani. This prevalence of stunting also differ from the one for African children under five in 2011, which was at 36%, and that of Asia same time which was at 27% (WHO, UNCEF, 2011). The high prevalence of stunting in children under five remains a public health concern, and one which goes unrecognized. More than 90% of the worlds stunted children under five live in Africa and Asia (WHO, UNICEF, 2011). This shows that the health and development of such children in developing countries is still at risk.

Socio economic factors could also affect the nutritional status of children under five years. The study revealed that Children from families whose monthly income was above KES 30, 000, where not likely to be stunted, underweight or wasting. Likewise children from households where the mothers had attained primary education and above were not likely to suffer from malnutrition in the study area. However, the study found no significance difference between the education level of mothers and stunting, while there was significance difference between stunting and socio-economic status of mothers at P.V <0.734.This could be because education level alone without economic gains is not equitable to food attainment and improvement of nutrition status. The study area being an area of informal settlement, unemployment is rampant and since food production in the area is a challenge due to lack of farming space in commercial areas then food insecurity is the norm in such households. Urbanization is usually accompanied by growth in poverty, food insecurity and malnutrition and this is crowned by people living in slum areas where overcrowding is rampant (Nkirigacha *et al.,* 2015). In this study majority (65.4%) of lactating mothers did not breast feed their infants exclusively for six months and 64.5% introduced complementary feeds before six months some as early as one month. This study agrees with a study done by Haile and Ambona, 2018, which found maternal health seeking behavior, early introduction of complementary feeds, parental education, monthly income and birth order significantly associated with child malnutrition P.V=0.05

The study found that majority (82%) of children under-five years consumed only one meal per day. 6.6% consumed three meals per day. This shows that food consumption in these children is a major challenge that requires nutritional intervention so that the high prevalence of stunting can be alleviated. It also found that children below six months were not affected nutritional wise due to the benefits from breastfeeding. Majority (79%) of the children under-five consumed cereals followed by legumes (10%) and eggs (1.6) and meat(0.6). considering that hemme iron and high quality protein is got from animal products food, then these children could be missing out on these very beneficial nutrients to a growing and developing child. This study agrees with a study done by Halimatou *et al*.,2016 in Kalale, Benin, which found that children under-five (71%)

consumed cereals and legumes, eggs and meat were least consumed. Under-weight in children under-five in the study was statistically associated with low food consumption rate. In this study low dietary diversity score were achieved by children under-five (58% (<4 food groups), 23% had medium scores (4-8 food groups), while 19% had high scores (6-8 food groups). This study agrees with a study done in the city of Maharashrra Benin (Douglas *et al.,* 2017), recorded low food diversity (54%) of children (<4 food groups), 33% had medium scores (4-5 food groups), while 13% had high scores (6-8 food groups). Nutrition interventions are needed to moderate malnutrition for preventing severe conditions such as anemia, marasmus or kwashiorkor in children under-five. In this study it appears that family size, food consumption frequency, dietary diversity, maternal health seeking behavior during pregnancy, exclusive breast feeding and time of giving complementary feeds are the most significant determinants of malnutrition among children under-five years.

Conclusion

The study shows that there is high prevalence of stunting and under-weight in children under-five years. There was also low dietary diversity and low food consumption frequency. The households where these children reside had large household sizes. Stunting had statically significant association with low dietary diversity and underweight had a statistically significant relationship with size of the household number. Variables such as height and weight measurements are significantly related with nutritional status of children under-five. Under nutrition can affect the cognitive domain and immune development of children under, leading to poor nutritional cycles in families.

Recommendation

Nutrition intervention is recommended to curb severe and moderate malnutrition and build a strong and economically viable population in the group of under-five, to prevent poor nutrition cycles in populations.

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