Determinants of Under Nutrition among Children Aged 6 to 59 Months in Gicumbi District Northern Province, Rwanda

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Abstract

Undernutrition is a major contributor of under-5 year's child death in general. This problem is listed as a direct cause of children mortality and morbidity. More than 156 million worldwide under five-year children are undernourished, but the majority of those who suffer from the burden are in developing countries. Public health concern, under fiver year children affected by undernutrition, has a modest chance of child survival, development, physical, mental and disability. The analysis was done using multivariate logistic regression. Findings revealed that the prevalence of stunting, wasting and underweight in this study were 23.5%, 19.3% and 32.1% which is lower compare to a national prevalence of undernutrition of Gicumbi district in RDHS (2015). Children aged more than 37 months were 10.58 times to develop stunting than to those aged 6 to 12 months (AOR = 10.58; 95CI = 4.41-25.36; p-value < 0.001). Boys were 6.7 times to be stunting (AOR = 6.70; 95CI = 3.61 - 12.46; p-value < 0.001) than girls counterparts. Regarding waste, the male child was 3.54 times to have wasting compare to their female counterparts (AOR = 3.54; 95CI = 1.95 - 6.41; p-value < 0.001). Children whose caretakers did not wash hands when caring were 1.9 times to be wasted (AOR = 1.90; 95CI = 1.05 - 3.41; p-value = 0.033) than those who used to wash their hands before caring. Underweight was 2.42 times more among children with mother headed house compared to fathers as head of household (AOR = 2.42; 95CI = 1.41 - 4.14; p-value = 0.001). Age and gender of the child were associated with stunting. Children aged 37 months above have high proportion significantly to stunting compared to those aged 6 to 12 months (p-value < 0.001). Boys were significant to be stunted compared to girls child (p-value < 0.001). Also, child gender was the only associated factors with wasting where male children were considered to be wasted than female child counterparts (p-value < 0.001). It was concluded that undernutrition remains a major challenge among children in the study setting. Sex of children, less frequency of feeding, poor wealth status, increasing age of children, large family size, the gender of head of household, and mother's occupation was found to be significantly associated with undernutrition at p-value ≤ 0.05.

Keywords: Determinant; Undernutrition; Children

Introduction

Children growth equilibrate diet be important, statistics show that 35% of deaths of under five-year children, is directly caused by undernutrition as it is estimated by the World Health Organization. During the development child will conduct diverse health complications. Elimination of famine, poverty child deaths by the year 2015 which are the achievement of goals one and four of millennium development goals, was difficult where estimated 186 million of under five years children 32% are stunted and 55 million 10% are wasted (WHO,

2008). The international organization, the World Bank, UNICEF, WHO 1990 to 2007 estimation makes in region worldwide remote the suppression of undernutrition burden. In 2013, 161 million of kids were estimated to be malnourished where the prevalence of stunting was estimated to 33% to 25% in 2000 to 2003, this rate was decreased to 199 million to 161 million and half of these children lived in Africa 1/3 and Asia. Stunting, wasting, severe wasting and overweight indicators, as research publication of May 2017 among children less than five years, which discovered late progression to accomplish the world assembly objectives of 2025 and the Sustainable Development Goals (SDGs) to 2030. Worldwide, undernutrition resulting to child death (Caulfield., *et al*. 2004). Globally children aged 6 to 59 months, around 7.6 million died of undernutrition in 2010 the consequence of underfeeding is public health concern (Blössner et al., 2005). Undernutrition becomes a big children killer in this centenary due to death prevalence of under year five children (Tankoi., *et al*. 2016). Around 11 million which are estimated to 60% of children death per year in the world (Mwangome., *et al*. 2011). Even if in many areas in Sub-Saharan Africa countries there is inexpensive and cheap food; where under five-year children are estimated to 18 million are chronically malnourished and died from this burden (Bocquenet., *et al*. 2016). The high prevalence of undernutrition among under five-year children is observed in this region which can be associated to rapid socio-demographic transition, which was a big failure of MDGs objective of lack of food eradication by half by 2015 mainly in Africa [1]. Majority of people affecting and suffer from famine are from Sub Saharan Africa over 800 million worldwide in 2004. According to different research conducted East Africa region is not exempted by the undernutrition problem of under 5-year children nationally it is estimated that 26% of children were stunted, while in Tanzania 1/3 less than 5years child is malnourished. Stunting is considered as the indicator of chronic malnutrition which is additional widespread amongst children with low weight at birth and represents (51%) where acute undernutrition indicator is wasting (5%) with the characteristic of children to be too thin for their age 14% underweight (Kabubo-Mariara., *et al.* 2009).

Materials and Methods

The methodology used for the development of this research is quantitative descriptive cross-sectional. A cluster random sampling technique was used. Each sector in Gicumbi District served as cluster accounting for 21 sectors which composed Gicumbi district. Then the list of household with children aged 6 to 59 months from each sector was obtained and the sample size in each sector was determined by using probability proportional to size.

Result and Discussion

This study has as objectives to determine the prevalence of undernutrition, to determine children nutritional status and factors associated with undernutrition among children aged 6 to 59 months in Gicumbi district. Socio-demographic characteristic shows half (48.1%) of household head were fathers to the child followed by being mothers (43.1%). More than half (53.6) of the household head were males. The highest percentage (47.2%) of the caretakers attained primary level of education and the majority were married (62.7%). Regarding the relation to the child, 54.7% were mothers. Most households (68.0%) had one child aged 6 to 59 months. Higher numbers of children (42.0%) were within the age group of 13 to 24 months and the mean age was 18.3 months with a standard deviation of 11.9 months. The gender distribution among the children also indicates that there were 53.9% females and 46.1% males. Where the size of the family was determined by Caretakers was requested to indicate the number of persons living in the house 29.3% reported 4 persons followed by 27.3% with 3 persons.

Analyzing water, hygiene and sanitation variables, majority of the caretakers (61.3%) were using public tape source of water for drinking while some were using from dug well (4.1%), river (5.2%) and rainwater (1.7%). About half (48.3%) of the respondents indicated that they were treating water to make it safe and the main method of treating was boiling (75.4%). All of the caretakers had toilets and majority (77.9%) was using a pit latrine. Most children (65.5%) were not using any type of toilets and common disposal system was dropping into the toilet (61.6%) by the caretakers. Regarding the disposal of garbage in the household, more than half (53.3%) were using open

field disposal. Surprisingly, most (54.7%) of the caretakers were not washing hands when caring for the child. Nevertheless, among those who used to wash their hands when caring for their children, a large percentage (87.8%) was using soap.

Concerning child feeding practice as variable 30.9% of the children were fed other than breast milk immediately after birth and the main food given was honey (17.0%) followed by cow milk (13.4%). Around one-fifth of the children started breastfeeding after 2 hours of birth. More than half (53.9%) were still breastfeeding during data collection. Considerable percentage (20.7%) of the children had only 1 month of exclusive breastfeeding and 40.3% complementary feeding were started at the age of under five months old age. About one-third of the children (34.8%) used to eat 3 times per day. Most of the children (85.6%), (95.0%), (87.3%) and (67.1%) ate semi-solid/soft food, grain root/tubers, beans/peas/lentils/nuts and milk/milk product in the previous day respectively. However, the majority (58.0%) and (74.0%) did not eat any animal meat and eggs respectively. The table further shows that 53.0% of the children ate legumes fruits and vitamin A on the following day.

Regarding the factors related to diseases control, (60.2%) were sick two weeks before the collection of data. Among those who was sick, cold/cough (38.1%) and diarrhoea (34.4%) were the common sicknesses and most (89.4%) were taken to the health facility for further treatment. About half (48.6%) were receiving food more than usual during the illnesses and (68.8%) of them continued breastfeeding. Large number (92.5%), (88.4%), (92.5%) and (96.1%) of the children received vitamin A, deworming tablet, vaccination and BCG/POLIO/DPT/Measles/other vaccines respectively.

Undernutrition was assessed by using Z-score for height for age (stunting), weight for height (wasting) and weight for age (underweight) that is below minus two and minus three standard deviations (-2SD and -3SD) according to WHO (2006) standards.

According to classification, -2SD is considered as moderate undernutrition and -3SD is considered as severe undernutrition and this was determined using the chart growth of WHO 2006. And the outcome indicates 10.5% of child moderate stunting while 13.0% had severe stunting. In regard to wasting, 11.3% had moderate and 8.0% had severe. The proportion of moderate underweight was 14.1% and severe was 18.0%. When combined the moderate and severe, the prevalence of stunting, wasting and underweight in this study were 23.5%, 19.3% and 32.1% respectively.
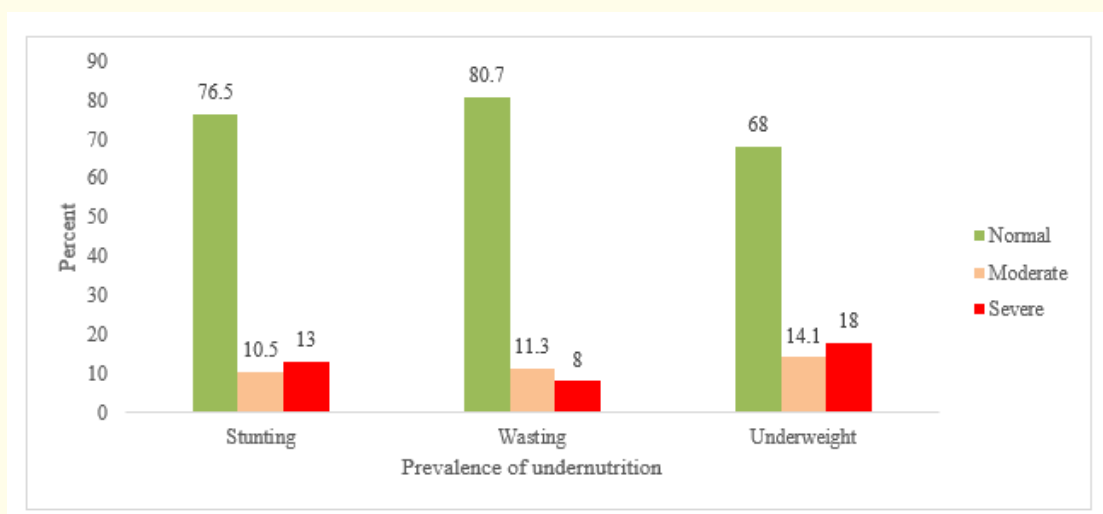
Findings from this study show that stunting, wasting, and underweight prevalence obtained were 23.5%, 19.3% and 32.1%. Stunting, underweight prevalence in this study is 11.5%, 15.7% lower than the study conducted in the Far-West Terai of Nepal but wasting prevalence in this study was high 16.1% [1]. Findings in the study were high 7%, 14%, 24% stunting, wasting and underweight than the result of the study done in Iraq on 606 under five years children [2]. It is 20.9%, 10.1% stunting and wasting lower than the findings from 3071 Pakistan children aged 0 to 59 months from the PDHS 2012 - 2013 (S Khan., *et al.* 2019). Although the prevalence of under nutrition higher in this finding as compared to study conducted in Mongolia, the prevalence of stunting, wasting and underweight were 15.6%, 1.7% and 4.7%, respectively [1]. This might be different also due to study period, socioeconomic characteristics, health service delivery, study area and age difference.

With reference to studies done in sub-Saharan Africa in Burkina Faso, the prevalence of stunting was 11.3% higher to stunting in this research findings (Poda., *et al.* 2017). The highest prevalence of stunting founded in Ethiopia 54% reported in Ethiopia demographic health survey 2011 (Kassahun Alemu 2013). The prevalence of undernutrition is higher in this study compare to prevalence of stunting, wasting and underweight were 18.4%, 5.3% and 10.4% of the study conducted in Ghana where the age of the child was associated with stunting, wasting and underweight, whereas sex was associated with stunting and wasting (Boah., *et al.* 2019). It is 12% lower to the prevalence of underweight of research done from Jomo Kenyatta University in Kenya (Kabubo-Mariara., *et al.* 2009)

Coming to the country previous study, on the determinant of undernutrition, stunting was 14.5% lower to the prevalence of stunting in RDHS 2015 (USAID) and lower 18% than the one in Ruhura Sector, Bugesera District Rwanda (Kateera., *et al.* 2015). Factors associated with higher rates of stunting included living in the lowest wealth quintile, having a mother with limited education, having a mother that smoked, being of the male sex, and being of low-birth-weight [3]. With regard to other study done in Rwanda childhood stunting increased with child age (OR = 6.60, P < 0.001), maternal age (OR = 1.63, P = 0.002), number of household members (OR = 1.38, P = 0.017), residence (OR = 1.82, P = 0.003), source of drinking water (OR = 1.37, P = 0.008) and adequate sanitation facilities (OR = 1.55, P < 0.01). Compared to males, females had lower risk of stunting (OR = 0.63, P < 0.001) (Nsereko., *et al.* 2018). This difference in prevalence found according to reviewed papers may be due to the difference in setting, study design, sample size, time of study and socio demographic characteristic of the population under the study. The reason of lower prevalence reported in this study can be outstanding by the different policy and strategies of Rwanda Government malnutrition eradication [4] by the involvement of community-based malnutrition monitoring in different health facilities in the country 37 months age and more child were 10.58 develop stunting compared to a child aged 6 to 12 months (AOR = 10.58; 95CI = 4.41 - 25.36; p-value < 0.001). Boys were 6.7 fold more likely to have stunting (AOR = 6.70; 95CI = 3.61 - 12.46; p-value < 0.001) compare to girls counterparts. Regarding wasting, boys child were 3.54 times more likely to have wasting compared to their female counterparts (AOR = 3.54; 95CI = 1.95 - 6.41; p-value < 0.001). Underweight was 2.42 times more among child with household headed by mothers compared to fathers as head of household (AOR = 2.42; 95CI = 1.41 - 4.14; p-value = 0.001). This study identified that the age and gender of the child were significantly associated with stunting. Children aged 37 months and above had a high proportion of stunting compared to those aged 6 to 12 months (p-value < 0.001). Male children were significantly more likely to have stunting compared to their female counterparts (p-value < 0.001). Similarly, the gender of the child was the only factor associated with wasting where male children were significantly more likely to have wasting compared to their female counterparts (p-value < 0.001). About underweight, head of household (HHH), sex of HHH and child age were statistically significant with underweight among the children. Underweight was significantly more among child with household headed by mothers compared to fathers or non-parental caretakers as head of household (p-value = 0.003). Likewise, household gender being as women were associated significantly with underweight (p-value = 0.003). Older child (25 months and above) had a significantly high proportion of underweight compared to those aged 6 to 12 months (p-value < 0.001). There was no association between socioeconomic factors and stunting among children aged 6 to 59 months. However, mother's activity was associated significantly to wasting were being a housewife and government employee had a higher proportion of children with wasting compare to merchants and farmers (p value = 0.036). No associations were between water, hygiene and sanitation to household and stunting as well underweight to under- five years. However, washing hands when the caring child was significantly associated with wast-

ing were those who used to wash their hands before caring had a lower proportion of children with wasting (p value = 0.039). Household food insecurity can be a major cause of problem and might be due to insufficient and inadequate diet in the family (RDHS, 2015) with poor wealth index by the family which cannot capable to afford the good care to children and all requirement compare to the family with good and higher economic and social status. The poor family health status can increase children chance to become sick and develop all forms of under nutrition.

Variables	Frequency (N = 362)	Percent (%)
Head of household (HHH)		
Mother	156	43.1
Father	174	48.1
Non parental caretaker	32	8.8
Sex of HHH		
Male	194	53.6
Female	168	46.4
Level of education of the HHH		
None	85	23.5
Primary level	171	47.2
Secondary level	81	22.4
University level	25	6.9
Marital status of HHH		
Single	61	16.9
Married	227	62.7
Divorced	30	8.3
Windowed	44	12.2
Relation to child		
Mother	198	54.7
Father	115	31.8
Non parental caretaker	49	13.5
Number of children aged 6 to 59 moths		
1 child	246	68.0
2 children	96	26.5
3 children	11	3.0
More than 3 children	9	2.5
Age of the child in months		
6 to12	135	37.3
13 to 24	152	42.0
25 to 36	32	8.8
37 and above	43	11.9
Sex of child		
Female	195	53.9
Male	167	46.1

Table 1: *Socio-demographic characteristic of the caretakers and children.*
Source: Primary data 2019.

Variables	Frequency (N = 362)	Percent (%)
Mother's occupation		
House wife	90	24.9
Famer	143	39.5
Marchant/trade	62	17.1
Government employee	28	7.7
Others	39	10.8
Father's occupation		
Jobless	170	47.0
Government employee	56	15.5
NGO employee	19	5.2
Businessman	46	12.7
Others	71	19.6
Estimated monthly income		
1000 to 10000	135	37.3
11000 to 20000	104	28.7
21000 to 30000	60	16.6
31000 to 40000	18	5.0
More than 40000	45	12.4
Number of children supported by the monthly income		
One child	119	32.9
Two children	138	38.1
Three children	70	19.3
More than three children	35	9.7
Monthly expenditure		
1000 to 10000	144	39.8
11000 to 20000	117	32.3
21000 to 30000	101	27.9
Number of room in your household		
1 room	85	23.5
2 room	133	36.7
3 room	96	26.5
4 rooms and more	48	13.3
Whether having own cultivate land		
Yes	154	42.5
No	208	57.5
Whether having domestic animals		
Yes	105	29.0
No	257	71.0
Kitchen garden		
Yes	162	44.8
No	200	55.2
Types of vegetable in the kitchen garden (n = 162)		
Tomatoes	26	7.2
Carrots	34	9.4
Legumes	89	24.6
Cabbage	13	3.6

***Table 2:** Socio-economic factors of the caretakers.*
Source: Primary data 2019.

Variables	Frequency (N = 362)	Percent (%)
Source of water		
Piped water	100	27.6
Public tap	222	61.3
Dug well	15	4.1
River/stream	19	5.2
Rain water	6	1.7
Whether treating water to make it safe		
Yes	175	48.3
No	187	51.7
Method of treating water to make it safe (n = 175)		
Boil	132	75.4
Water filter	20	11.4
Chlorination	23	13.1
Types of toilet at home		
Flush toilet	71	19.6
Pit latrine	282	77.9
Others	9	2.5
Whether a child use a toilet		
Yes	125	34.5
No	237	65.5
Where the child faeces are disposed		
Dropped in the toilet	223	61.6
Disposed some where	121	33.4
Did nothing	12	3.3
Others	6	1.7
Ways of disposing garbage in the HH		
Open field disposal	193	53.3
In a pit	126	34.8
Burning	12	3.3
Road in the street	26	7.2
Others	5	1.4
Whether washing hands when caring child		
Yes	164	45.3
No	198	54.7
Means of using to wash hands (n = 164)		
Soap	144	87.8
Plain water	20	12.2

Table 3: *Water, hygiene and sanitation in the household.*
Source: Primary data 2019.

Variables	Frequency (N = 362)	Percent (%)
Whether the child was fed anything other than breast milk immediately after birth		
Yes	112	30.9
No	250	69.1
Type of the food given to child after birth other than breast milk (n = 112)		
Honey	19	17.0
Sugar	11	9.8
Cow milk	15	13.4
Others	67	59.8
Duration of breastfeeding after birth		
0 to 1 hour	281	77.6
2 to 6 hours	74	20.4
After 6 hours	7	1.9
Whether the child is still breastfeeding		
Yes	195	53.9
No	167	46.1
Duration of exclusively breastfeeding		
1 month	75	20.7
2 months	34	9.4
3 months	4	1.1
4 months	9	2.5
5 months	24	6.6
6 months	208	57.5
More than 6 months	8	2.2
Age at which complementary feeding were introduced		
Less than 5 months	146	40.3
6 months	216	59.7
Child received semi solid or soft food in the previous day		
Yes	310	85.6
No	52	14.4
Frequency of complementary food per day		
1 time a day	100	27.6
2 time a day	79	21.8
3 time a days	126	34.8
4 times a day	57	15.7
Child ate grain root and tubers in the previous day		
Yes	344	95.0
No	18	5.0
Child ate beans peas lentils and nuts in the previous day		
Yes	316	87.3
No	46	12.7
Child ate milk curd, cheese, others milk product in the previous day		
Yes	243	67.1
No	119	32.9
Child ate pork, goat, duct, or other birds, kidney, heart and other organ meats in the previous day		
Yes	152	42.0
No	210	58.0
Child ate eggs in the previous day		
Yes	94	26.0
No	268	74.0
Child ate vitamin A rich fruits and vegetables in the previous day		
Yes	192	53.0
No	170	47.0

Table 4: Child feeding practice.
Source: Primary data 2019.

Variables	Frequency (N = 362)	Percent (%)
Child sickness in the last two weeks		
Yes	218	60.2
No	144	39.8
Type of illness (n = 218)		
Diarrhea	75	34.4
Cold/cough	83	38.1
Pneumonia	26	11.9
Difficult breathing	20	9.2
Fever	8	3.7
Others	6	2.8
Child receiving any food during the illness (n = 218)		
More than usual	106	48.6
Same as usual	48	22.0
Less than usual	27	12.4
Was not given	18	8.3
No ate anything	19	8.7
Whether continue to breastfeeding during the period of illness (n = 218)		
Yes	150	68.8
No	68	31.2
Child was taken to the health facility for treatment (n = 218)		
Yes	195	89.4
No	23	10.6
Child received vitamin A		
Yes	335	92.5
No	27	7.5
Child received worming tablet within the last 6 months		
Yes	320	88.4
No	42	11.6
Child ever received vaccination		
Yes	335	92.5
No	27	7.5
Child received BCG, POLIO, DPT, Measles, and other vaccines		
Yes	348	96.1
No	14	3.9

Table 5: Factors related to prevention and control of diseases.
Source: Primary data 2019.

Conclusion

In the study called the determinant of undernutrition among children aged 6 to 59 months in Gicumbi District Rwanda tabulation and analysis of data obtained reported the socio-demographic data half (48.1%) of household head were fathers to the child followed by being mothers (43.1%). More than half (53.6) of the household head were males. The highest percentage (47.2%) of the caretakers attained primary level of education and the majority were married (62.7%). Regarding the relation to the child, 54.7% were mothers. Most households (68.0%) had one child aged 6 to 59 months.

Regarding water hygiene and sanitation Analyzing water, hygiene and sanitation variables, majority of the caretakers (61.3%) were using public tape source of water for drinking while some were using from dug well (4.1%), river (5.2%) and rainwater (1.7%). About half (48.3%) of the respondents indicated that they were treating water to make it safe and the main method of treating was boiling (75.4%). All of the caretakers had toilets and majorities (77.9%) were using a pit latrine.

Feeding practice and factors related to diseases control were been reported. About one-third of the children (34.8%) used to eat 3 times per day. Most of the children (85.6%), (95.0%), (87.3%) and (67.1%) ate semi-solid/soft food, grain root/tubers, beans/peas/lentils/nuts and milk/milk product in the previous day respectively. However, the majority (58.0%) and (74.0%) did not eat any animal meat and eggs respectively. And about half (48.6%) were receiving food more than usual during the illnesses and (68.8%) of them continued breastfeeding. Large number (92.5%), (88.4%), (92.5%) and (96.1%) of the children received vitamin A, deworming tablet, vaccination and BCG/POLIO/DPT/Measles/other vaccines respectively.

Finally, this study allowed identifying the nutritional status of children aged 6 to 59 months in Gicumbi District. The prevalence of stunting, wasting and underweight in this study were 23.5%, 19.3% and 32.1% respectively. Research finds the determinants of undernutrition among children age 6 to 59 months in Gicumbi District Rwanda such as family size, the gender of household head, mothers' occupation, sex of children, less frequency of feeding, increasing children in age and poor wealth status [5-13].

Bibliography

1. Ahmed N., *et al*. "Determinants of Child Undernutrition in Bangladesh Literature Review" (2015).

2. Abdulla MM. "Assessment and Determinants of Nutritional Status in a Sample of Under Five-Year-Old Iraqi Children". *European Journal of Biology and Medical Science Research* 4.4 (2016): 1-24.

3. Binagwaho Agnes., *et al*. "Trends in burden and risk factors associated with childhood stunting in Rwanda from 2000 to 2015: Policy and program implications". *BMC Public Health* 20.1 (2020): 83.

4. Binagwaho Agnès., *et al*. "Underdiagnosis of malnutrition in infants and young children in Rwanda: Implications for attainment of the Millennium Development Goal to end poverty and hunger". *International Journal for Equity in Health* 10.1 (2011): 61.

5. Maryam Ahmed Abdulrahim. "Socio-cultural determinants of malnutrition among children aged below 5 years in garissa sub county, Kenya". Masters of Science (public health) jomo kenyatta university of agriculture and technology (2016).

6. Abebaw D. "Stunting and Associated Factors among Children Aged 6-59 Months in Lasta Woreda, North East Ethiopia, 2015: A Community Based Cross Sectional Study Design". *Journal of Family Medicine* 4.3 (2017).

7. Aburto NJ., *et al*. "The effect of nutritional supplementation on physical activity and exploratory behavior of Mexican infants aged 8-12 months". *European Journal of Clinical Nutrition* 64.6 (2010): 644-651.

8. Aguayo VM., *et al*. "Determinants of stunting and poor linear growth in children under 2 years of age in India: An in-depth analysis of Maharashtra's comprehensive nutrition survey". *Maternal and Child Nutrition* 12.1 (2016): 121-140.

9. Akombi BJ., *et al*. "Stunting and severe stunting among children under-5 years in Nigeria: A multilevel analysis". *BMC Pediatrics* 17.1 (2017): 15.

10. Akombi Blessing J., *et al*. "Child malnutrition in sub-Saharan Africa: A meta-analysis of demographic and health surveys (2006-2016)". *PLoS ONE* 12.5 (2017): e0177338.

11. Asfaw M., *et al*. "Prevalence of undernutrition and associated factors among children aged between six to fifty nine months in Bule Hora district, South Ethiopia". *BMC Public Health* 15.1 (2015): 41.

12. Ayana AB., *et al*. "Determinants of acute malnutrition among children aged 6-59 months in Public Hospitals, Oromia region, West Ethiopia: a case-control study". *BMC Nutrition* 1.1 (2015): 34.

13. Bain LE., *et al*. "Malnutrition in Sub - Saharan Africa: Burden, causes and prospects". *Pan African Medical Journal* 15 (2013): 120.

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