

Prevalence of Stunting and its Associated Factors Among Children Under 5 Age in Holeta Town, West Shoa Zone, Oromia Region, Ethiopia, 2017

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Abstract

Background: Malnutrition remains one of the main public health problems. Malnutrition remains one of the most common causes of morbidity and mortality among children throughout the world. Children malnutrition affects academic performance, physical and mental development throughout their lives. In Ethiopia, 38% of under five children are stunted. There are limited studies on the prevalence of stunting among children coming to health facilities in Ethiopia. Hence, this study was intended to assess the prevalence and factors associated with stunting among under five children in Holeta town, Western Ethiopia.

Methods: Community based cross-sectional quantitative study was conducted in Holeta town from April 01 to April 25, 2017. The study populations were children under five age living in randomly selected kebeles in the town. The sample size was 423 and study participants were selected using systematic random sampling method. Data were collected using structured questionnaire and anthropometric measurements. To identify independent predictors of stunting bivariate and multivariate logistic regression were carried out.

Results: The prevalence of stunting was 181 (45.7%). Prevalence of stunting was 108 (48.2%) among male children and 73 (42.4%) among female children. Stunting was almost 3 times higher among rural residents than urban residents (AOR = 2.88, 95%CI: 1.25 - 6.66). The other independent factors associated with stunting were children age (13 - 24) months (AOR = 1.9, 95%CI = 1.15 - 3.48) and 25 - 36 months (AOR = 2.6, 95%CI = 1.14 - 3.89), Maternal education being illiterate (AOR, 1.53, 95%CI: 1.1 - 3.51) and monthly income less than 750birr (AOR = 1.81, 95%CI: 1.37, 2.997).

Conclusions: Stunting was high among children below five years of age in Holeta town. Age of child, maternal educational, low household income and rural residence were factors affecting the child nutritional status. Hence due emphasis should be given to nutritional interventions, environmental sanitation, hygienic practice, breast feeding, and weaning practices.

Keywords: *Stunting; Children; Malnutrition; Ethiopia*

Introduction

Undernutrition is a general term for a medical condition caused by an insufficient diet. It is any physical condition resulting either from an inappropriate diet or from a physical inability to absorb or metabolize nutrients [1]. Many development programs, projects and policies therefore include food security objectives in their objective. But food is also a source of pleasure apart from its physiological necessity [2]. According to the World Health Organization (WHO), the term malnutrition usually refers to generally bad or faulty nutrition and is most often related to under nutrition but it generally refers both to under nutrition and over nutrition [3]. Undernutrition can be related to various factors, such as poverty, infections which lead to poor appetite, and lack of access to food, sanitation and/or health services. It arises from deficiencies of specific nutrients based on inappropriate combinations or proportions of foods. The four major forms of malnutrition are Protein energy malnutrition (PEM), Iodine Deficiency Disorder (IDD), vitamin A deficiency, and iron deficiency anemia and negatively affects quality of life and learning, and also causing disease and even death [4].

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Childhood malnutrition is a major public health problem estimated to affect 165 million (10%) of under-five children in developing countries. As an underlying cause, it is responsible for 15% of the total under-five death burden each year [5]. Ethiopia is one of the countries with the highest prevalence of malnutrition in under-five children. During the Demography Health Survey (DHS) 2016, 10% of under-five children in the country were wasted, and 3% were severely wasted. However the prevalence stunting (chronic malnutrition) has remained pervasively high with 38% of under five years old children in Ethiopia being stunted [6].

Undernutrition commonly affects all groups in a community, but infants and young children are the most vulnerable because of their high nutritional requirements for growth and development. Each year globally, 165 million children are stunted and under nutrition underlie 3.1 million deaths in children younger than 5 years [5]. Proper nutrition in childhood can reinforce lifelong eating habits that contribute to children's overall well-being and help them to grow up to their full potential and a healthy life [4]. Estimations on the disease burden of malnutrition indicate the burden that could be avoided if malnutrition and/or the factors were to be eliminated.

It is not only an important cause of mortality and morbidity but also leads to physical and mental impairment in children. Health and physical consequences of prolonged states of malnourishment among children were delay in their physical growth, lower intellectual quotient, poor cognitive ability, decreased economic productivity, decreased reproductive performance, poor school achievement and poor school performance, greater behavioral problems and deficient social skills, and susceptibility to contracting diseases [7] undernutrition is considered as a risk factor for disease and mortality. Worldwide, over 10 million children under the age of 5 years die every year from preventable and treatable illnesses despite effective health interventions. Eighty percent of the world's undernourished children live in 20 countries half of these deaths (54%) are caused by undernutrition. Over a one third of all deaths of children under the age of five are directly or indirectly caused by under nutrition and it can increase the risk of both morbidity and mortality [5].

Although there are several efforts in reducing childhood malnutrition, stunting had become pervasively high in Ethiopia. Children under five are the most vulnerable groups to malnutrition.

As nutritional status can vary by background characteristics, there is a need to investigate underlying variations of these nutritional indicators and associated factors among children of under five years of age in the study area.

Determining the prevalence and associated factors for malnutrition among children of under five years of age will assist the health system and other concerned stakeholders to plan appropriate and efficient nutrition intervention. There is no recent study done and documented to this specific topic in the study area. Therefore, this study intends to assess prevalence of stunting and its associated factors among children of under five years of age in Holeta town, Ethiopia, 2017.

Methods and Materials

Study area and period

The study was conducted in HOLETA town from April 01 to April 25, 2017 which is located 40 km from Addis Ababa on the way to Ambo western Ethiopia. The town was established in 1894 E.C during MINILIK II regime since then it made progressive development in culture, infrastructure, education, business, Health and so on. The 2007 national census reported a total population for HOLETA of 25 605, of whom 12,605 were men and 12,988 were women. 73% of the population practiced Ethiopian Orthodox Christianity, while 20.44% of the population was Protestant and 5.43% were Muslim. The town is subdivided into 8 KEBLE, based on the information obtained; the population of HOLETA obtains health services through two government owned health centers, health posts and private clinics.

Study Design and Period: Community based cross-sectional quantitative study was conducted in Holeta town.

Source Population: Children under five years age and their mothers or care takers living in the town.

Study Population: The study populations were under five years' old children and their mothers or care takers living in randomly selected kebeles.

Study Subject: Each child less than five years and his/her mother or care taker who have been chosen by systematic random method and involved in the study.

Inclusion and Exclusion Criteria

Inclusion criteria for children: Children who are living in the study area for more than or equal to 6 months.

Exclusion criteria for children

- Children who are seriously ill at the time of data collection.
- Children with visible physical deformity due to the fact it may under or overestimate anthropometric results.

Inclusion criteria for mothers or care takers: All mothers or caretakers of all children who are eligible to the study.

Exclusion criteria for mothers or caretakers: Mothers or care takers with hearing problem or mental problem. For anthropometric measurement of the mother, mothers with visible physical deformity and who are pregnant (by asking them).

Sample Size determination

The sample size was estimated by using the single population proportion formula

$$n = \frac{(Z_{\alpha/2})^2 p (1-p)}{d^2}$$

Where: n = sample required, Z = 95% confidence level = 1.96, P = prevalence rate, D = margin of error (5%). After including 10% nonresponse rates, 423 individuals were included in the study.

Sampling Techniques

Systematic random sampling method will be used to select study participants. The study subjects were allocated to selected kebeles using proportional to population size based on number of population of under five years old children of each kebele. The number of under five children was obtained by using conversion factor settled for Oromia that is 16.4%. Then systematic random sampling method was applied to select study participants from total population of under five children in each kebele. (every 9th house of those houses having at least one under five child).

Data Collection

Data were collected using structured questionnaire adopted from Ethiopian National nutrition survey questionnaire and there are also anthropometric measurements. In households with more than one under five children, one child was selected randomly. Measurement of height (length) was done in a lying position with wooden board for children of age under two years (below 85 cm) and for children above two years and for mothers' stature was measured in a standing position in centimeters to the nearest of 1 cm. Measurements were taken twice and the average was calculated. Prior to interview, informed consent was obtained from all participants.

Data Quality Management

Both the interviewers and supervisors were students trained for three days on data collection and interviewing approach, anthropometric measurement and data recording. Pre-test was done on another kebele on 30 mother child pairs before the actual data collection to see for the accuracy of responses and to estimate time needed. On daily basis collected information was reviewed and possible errors were returned to the collectors for correction.

Data Processing and Analysis

First the data were checked for completeness and consistency. Then coded and entered in the computer using Epi data version 3.2 software. WHO Anthro software was used to convert nutritional data into Z-scores of the indices. Then, the data were exported to SPSS

program Version 20 for data analysis. To identify independent predictors of stunting bivariate and multivariate logistic regression were carried out. For all statistical tests P-value less than 0.05 was considered as a cut off point for statistical significance.

Variables

Dependent variable: The dependent variable for this study was stunting.

Independent variables: Religion, Ethnicity, Family size, Income, Maternal and paternal educational status, maternal employment, Head of the household, Age of the child, age of the mother, Sex of the child, birth order of the child, morbidity status of the child, Personal hygiene, feeding and caring practice, Source of Water supply, environmental sanitation and presence of latrine.

Operational Definition

Malnutrition - Refers to under nutrition that include wasting Stunting and underweight less than -2 SD below the International median NCHS/WHO reference values.

Stunting - H/A that is less than -2 SD below the International median NCHS/WHO reference values.

Ethical Consideration

Ethical clearance was obtained from Ambo University, college of medicine and health sciences Research Ethics Review Committee. A formal letter was submitted to all the concerned bodies in the woreda to obtain their co-operation in facilitating the study. The interviewers were explained the objective, benefit and risks of the study to get informed consent from parents of the study participants prior to data collection. The respondents were told as they have full right to refuse or decline from the study at any time without any form of prejudice was made.

Limitation and Strength of the Study

Limitation of the study: Limitations of this study were recall bias, under or over reporting of age of the mother and children

Strength of the study: Since the study was community based and interview was conducted by going house to house so it can represent the community

Results

Description of study participants

Socio Demographic Characteristics of Study Participants

Four hundred twenty-three study participants were included in the study. The response rate was 93.6%. Among all participants, 224 (56.5%) and 172 (43.5%) were males and females, respectively. Of the total respondents 358 (90.4%) of them were Oromo in their ethnicity. Most, 315 (79.5%) of the caretakers and/or mothers, were orthodox Christians. Of the total parents, 225 (56.8%) were born from illiterate mothers. Majority, 287 (72.5%) of mothers, were housewives (Table 1).

Socio demographic variables		Frequency	Percent
Head of house hold	Male	316	79.8
	Female	80	20.2
Sex of the child	Male	224	56.5
	Female	172	43.5
Age of the child in months	0-6	31	7.8
	12-Jul	105	26.5
	13-24	130	32.8
	25-36	85	21.5
	37-59	45	11.4
Ethnicity	Oromo	358	90.4
	Amhara	28	7.1
	Tigre	2	0.5
	Gurage	7	1.7
	Other	1	0.3
Family size	5-Feb	200	50.5
	12-Jun	192	48.5
	> 12	4	1
Education status the mother	Illiterate	225	56.8
	Read and write	15	3.8
	8-Jan	108	27.3
	12-Sep	21	5.3
	> 12	27	6.8
Educational status the father	Illiterate	196	49.5
	Read and write	16	4.1
	8-Jan	98	24.7
	12-Sep	41	10.3
	> 12	45	11.4
Occupation of the mother	House wife	287	72.5
	Farmer	36	9.1
	Merchant	43	10.8
	Employed	30	7.6

Table 1: Showed socio demographic characteristics of study participants. Four hundred twenty-three study participants were included in the study. The response rate was 93.6%. Among all participants, 224 (56.5%) and 172 (43.5%) were males and females, respectively. Of the total respondents 358 (90.4%) of them were Oromo in their ethnicity. Most, 315 (79.5%) of the caretakers and/or mothers, were orthodox Christians. Of the total parents, 225 (56.8%) were born from illiterate mothers. Majority, 287 (72.5%) of mothers, were housewives.

Feeding practices

The study subjects 177 (67.1%) were initiated breast feeding practice immediately after birth. In addition, to initiation of breastfeeding practice and 40 (15%) were received pre- lactation food or fluids like Butter and milk. From the participants 346 (87%) of children

were immunized and 50 (13%) of children were not immunized. Colostrum feeding was not practiced for 79 (29.9%) of under two children. Totally 245 (92.8%) of mothers of under two children had a practice of breast feeding during night. Under two children which started complementary food at 6 months were 198 (75%) (Table 2).

Variables		Number	Percent
Time of initiation of breast feeding	Immediately	177	67.1
	With 1hr	51	19.3
	After hrs.	21	7.9
	After days	15	5.7
Current breast-feeding status	Yes	224	84.8
	No	40	15.2
Frequency of breast feeding per day	< 8	60	22.7
	10-Aug	168	63.6
	> 10	36	13.7
Time of initiation of complementary food	< 6 mon	10	3.8
	6 mon	198	75
	> 6 mon	38	14.4
	Not start yet	18	6.8
Immunization	Yes	346	87
	No	50	13

Table 2: Showed feeding practices of the under five children in Holeta town. The study subjects 177 (67.1%) were initiated breast feeding practice immediately after birth, 40 (15%) were received pre- lactation food or fluids like Butter and milk. From the participants 346 (87%) of children were immunized, Colostrum feeding was not practiced for 79 (29.9%) of under two children. Totally 245 (92.8%) of mothers of under two children had a practice of breast feeding during night. Under two children which started complementary food at 6 months were 198 (75%).

Prevalence and associated factors of stunting among children under five years.

In this study the prevalence of stunting was About 181 (45.8%). Out of 224 male children, 108 (48.2%) of them were stunted while among 172 female children, 73 (42.4%) of the were stunted. Association between stunting, and the independent variables, socio demographic, child characteristics, feeding practice, maternal characteristics and personal and sanitation condition variables were assessed using bivariate analysis. And stunting was associated with, place of residence, sex of head of house hold, number of under-fives in the house mother’s educational status, monthly income of the family, sex of the child, age of the child. It was examined in multiple logistic analyses that among the independent variables, which showed association during bivariate analysis, place of residence, age of the child, maternal educational status, and monthly income were found out to be significantly associated with stunting.

Place of residence was one of the variables which showed a significant association with stunting and it was found out that stunting was almost 3 times higher among rural residents than urban residents (AOR = 2.88, 95%CI: 1.25 - 6.66). Age of the child was one of the determinants of stunting and children in the age range of 13-24 months were 2 times (AOR = 1.9, 95%CI = 1.15 - 3.48) more likely to be stunted than children of less than 7 months of age, and similarly children between 25-36 months were 2 times (AOR = 2.6. 95%CI = 1.14 - 3.89) more likely to be stunted than children of under 7 months of age (AOR = 2.6, 95%CI: 1.14 - 3.89). Children who had illiterate mothers were 1.5 more likely to be stunted (AOR = 1.53, 95%CI: 1.1 - 3.51) and Children from low household income (monthly income less than 750birr) were almost twice more likely to be stunted (AOR = 1.81, 95%CI: 1.37, 2.997) (Table 3).

Variables	Category	Crude OR (95% CI)	AOR (95%CI)
Place of residence	Urban	1	
	Rural	2.45 (1.78 - 3.38)	2.88 (1.25 - 6.66) **
Head of house hold	Male	1	
	Female	1.51 (1.06 - 2.16)	0.72 (0.47 - 1.12)
Number of under five	1	1	
	> = 2	1.07 (0.8 - 1.42)	1.8 (0.91 - 2.71)
Education status of the mother	Illiterate	3.39 (1.76 - 6.5)	1.53 (1.1 - 3.51) **
	Read and write	2.35 (0.9 - 6.11)	1.04 (0.39 - 5.31)
	1 - 8	2.11 (1.06 - 4.18)	0.75 (0.28 - 2.03)
	9 - 12	1.23 (0.49 - 3.07)	1.19 (0.34 - 4.18)
	> 12	1	
Sex of the child	Male	1.32 (1.01 - 1.86)	1.33 (0.94 - 1.88)
	Female	1	
Age of the child	0 - 6	1	
	7 - 12	1.77 (1.05 - 2.97)	1.12 (0.61 - 2.07)
	13 - 24	1.88 (1.14 - 3.13)	1.9 (1.15 - 3.48) **
	25 - 36	2.08 (1.22 - 3.55)	2.6 (1.14 - 3.89) **
	37 - 59	1.97 (1.01 - 3.84)	1.74 (0.812 - 3.7)
Monthly income	< 750	1.77 (1.01 - 3.08)	1.81 (1.37, 2.997) **
	750 - 1500	0.77 (0.36 - 1.6)	0.49 (0.21, 1.19)
	> 1500	1	1

Table 3: Showed factors associated with stunting among under five children in Holeta town. After adjustment, factors significantly associated with stunting were place of residence, age of the child, maternal educational status, and monthly income.

** Significant at $p < 0.05$, OR: Odd Ratio; AOR: Adjusted Odd Ratio; CI: Confidence Interval

Discussion

This community based study showed the magnitude and factors associated with stunting among under-five children. The study showed that the prevalence of stunting, was about 45%. The main determinants of stunting were place of residence, maternal educational status, age of the child and monthly income of the household.

According to WHO classification the prevalence of stunting in the area is categorized as very high. It is also higher than study conducted in Gondar which was 24% [8]. This might be difference in geography and in addition study conducted in Gondar uses the NCHS growth standard unlike to this study in which WHO growth standard is used.

The current study revealed that place of residence was strongly associated with stunting and children living in rural kebeles were more likely to be stunted than children living in urban kebeles (AOR = 2,88 p value 0.01), this finding was consistent with study conducted in Mongolia, p value <0.001 [9]. Another study conducted in Zambia found that rural children were 2 time more stunted than urban children (OR 1.92, 95% CI = (1.86 - 1.98) [10]. Coming to Ethiopia, the national demographic health survey had reported higher prevalence of stunting in rural areas.

With regard the age of the child, this study found that age of the child was one of the determinants of stunting and children aged 13 - 24 and 25 - 36 months were 2 times more likely to be stunted than < 7 months of age. The reason for the higher risk of stunting among children aged 24 - 36 might be, children in this age group are in a phase of weaning period and this finding was in agreement with study conducted in west Gojjam [11], study in Uganda [12] and in India [13].

This study indicated that maternal educational status was independently associated with outcome variables. However, a study reported by Edris [8] showed that maternal education status had no significant association with nutritional status of the children. This could be attributed to the fact that the overwhelming majority of the mothers were illiterate and sample size was not adequate to detect differences [8].

Conclusions

Stunting was high among children below five years of age in Holeta town. Males were more affected with undernutrition than females. Age of the child, maternal educational status, low household income and residence of the child were the factors affecting the child nutritional status. Multisector partnership and networking are important for health promotion and minimizing child's food insecurity. Emphasis should be given to strengthen the health extension program to improve and provide necessary education on nutritional program, environmental sanitation, hygienic practice, breast feeding, and weaning practices. Longitudinal and qualitative research shall be done on quantity and quality of nutrients and on the feeding habits of the community.

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