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Prevalence of stunting and associated factors among children aged 6 to 59 months in Areka town, Wolaita Zone, Southern Ethiopia

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Abstract

Malnutrition remains one of the most common causes of morbidity and mortality among children in low-income countries. Over two-thirds of these deaths, which are often associated with inappropriate feeding practices, occur during the first five years of life. Stunting is also, underlying cause of 57% of child deaths and persist as major public health problems in Ethiopia. Nonetheless, little is known about the magnitude and factors associated with Stunting among children aged 6 to 59 months across all corners of Ethiopia. So we were interested to assess the prevalence of stunting and associated factors among children aged 6 to 59 months in Areka town,Wolaita Zone, Southern Ethiopia. A community based cross-sectional survey design was used among randomly selected 379 children and their mothers / care givers (mothers-child pair). Socio- demographic data were collected using an interviewer administered pretested structured questionnaire. Moreover, anthropometric data were collected using digital weight scale, length and height boards. Data were entered in EPI-info Version 3.5.2 and then exported to SPSS version 21.0. The World Health Organization (WHO) anthros software was used to analyze anthropometric data to determine Z-score. Both descriptive and inferential statistics were used to analyze the data. Odds ratio along with 95% CI was estimated to identify factors associated with child underweight using multivariable logistic regression. The level of statistical significance was declared at p –value less - than 0.05. The prevalence of underweight was 13.5%. Having large family size (7+) was associated with underweight [(AOR=7.9, 95%CI=2.7-17.6)]. Mother's occupation (being unemployed) [(AOR=4.5, 95%CI= (1.8-11.2)] and child's age (6-36 months) [(AOR=2.2, 95%CI= (1.08-4.8)] were found to be factors associated with underweight. The prevalence of child stunting in this study was found to be moderate in the study area. Therefore; immediate interventions targeted to community management of acute malnutrition might be appropriate to manage underweight in the study area.
Keywords : stunting Areka town, children

Background

Stunting is the result of complex interactions between food consumption and the overall status of health and health care practices (12). Numerous socioeconomic and cultural factors influence nutritional status of women and children [1&19]. Adequate nutrition during infancy and early childhood is fundamental to the development of each Child's full potential [2 &13]. World Health Organization recommends introducing complementary foods when an infant reaches 6 months of age because after sixth month of age breast milk alone is no longer sufficient to meet the nutritional requirements of 6-59 months of age. Worldwide, 195 million under-five children were affected by malnutrition; 90% of them live in sub-Saharan Africa and South Asia [3]. According to WHO about 178 million children under five were too short for their age group [4].

In Kenya, National Bureau of Statistics (KNBS) indicated that 35% of children under five were stunted and 16% severely stunted. After a child reaches 2 years of age, it is very difficult to reverse stunting that has occurred earlier [5]. In appropriate feeding practices such as breastfeeding and complementary feeding are responsible for one-third of the causes of stunting in infants(14 &15). Improper feeding practices can account for poor nutrition which contributes to 1 out of 2 deaths (53%) associated with infectious disease [6]. Malnutrition is one of the leading causes of morbidity and mortality in children under five years of age in Ethiopia and has the second highest rate of malnutrition in Sub-Saharan Africa [7].

Nutritional status of children today reflects a healthy and productive generation in the future. Improved nutrition and health enhance the learning ability of children. In the long run it leads to an increase in the strength of the labor force and thereby it contributes positively to the economic growth. Adequate feeding is a requirement to good nutritional status in any given time of human life because consumption of nutritionally inappropriate diet result in malnutrition [8].Appropriate feeding practices during infancy are essential for attaining and maintaining proper nutrition, health, and development of infants and children [8].In many developing countries, nutritional problems in infants and young children are strongly associated to the feeding practices. Along with other things,

feeding practices have an impact on physical growth, which is regarded as one of the best indicators of children's well-being [9]. EDHS 2011 results show that stunting is 44.4% which persist as major public health problems in Ethiopia[1].

Statement of the Problem

Globally, 50-60% of child deaths were attributable to under nutrition; a third of these are due to inadequate complementary feeding followed by poor dietary diversity. One of the most critical factors for children's health and development is their nutritional status. Children who are undernourished are less able to fight infections and more likely to die young. Less than one-third of under five years aged children met the minimum criteria for dietary diversity, and only 50% received the minimum number of meals in the world in general [2]. Malnutrition remains one of the most common causes of morbidity and mortality among children throughout the world. Over two-thirds of these deaths, which are often associated with inappropriate feeding practices, occur during the first five year of life [3].

Nutritional deficiencies affect long term physical growth and development and may lead to high level of illness and disability in adult life. Moreover, high prevalence of malnutrition jeopardizes future economic growth by reducing the intellectual and physical potential of entire population. Under nutrition among children remains common in many parts of the world [5].

According to 2011 EDHS results, stunting persist as major public health problems in Ethiopia which rates 44.4%. These national levels mask geographic differences-malnutrition is higher in rural versus urban areas, due to cross cut issue. Inappropriate complementary feeding practices such as; untimely introduction of complementary foods, improper feeding frequency and low dietary diversity of complementary foods have been widely shown to increase the risk of stunting [6].

In fact, malnutrition is the underlying cause of 57% of child deaths in Ethiopia with some of the highest rates of stunting in the world. Contributing factors to under nutrition include widespread poverty, limited employment opportunities, poor infrastructure, high population pressure, low education levels, inadequate access to clean water and sanitation, high rates of migration and poor access to health services. Without increased efforts to improve the nutritional status of vulnerable groups such as mothers and children under five years old, it is difficult and risks falling of halving underweight and reducing child mortality

However there is limited study conducted in Areka town to identify the stunting and associated factors of 6-59 months aged children. Therefore, this study will aim to determine prevalence of stunting and identify associated factors among children aged 6 to 59 months in Areka town, Wolaita Zone, Southern Ethiopia.

Rationale of the study

Various studies conducted gave more focus to assessing rural nutritional status. Until recently, there was limited evidence on nutritional status and its associated factors and the result showed that high prevalence rate and multidimensional associated factors.

So that the information generated will be useful in designing appropriate interventions to improve nutritional status of under five years of children thus mitigating child malnutrition in the target area and other similar areas. The study will also contribute knowledge to ongoing research efforts on children stunting and its associated factors. Moreover, no more published researches were available in the study area. Therefore, this study was done with the objective of determining of children stunting and identifying its associated factors in ArekaTown.

Objective of the study is to assess the prevalence of stunting and associated factors among children aged 6 to 59 months in Areka town, Wolaita Zone, Southern Ethiopia,2015

Methods and materials

Study setting and Period

The study was conducted in Areka Town in wolaita zone. Geographically, the city is situated at 7.04°-7.1° latitude north and 37.68°-37.72min°' longitude east. The city is 299 Km from Addis Ababa the capital of Ethiopia and 197 Km South from the regional Capital Hawassa. It is also 29 Km south west from Wolaita Soddo, the capital city of Wolaita zone. The town is located at an altitude of 1750m above sea level with astronomical location of 7.17^0- 7.98^0 latitude and 37.62^0-37.83^0 longitudes in the east direction. From this altitudinal point of view, the town's weather condition can be categorized under "Dega" or medium land climate with warm air condition.

The mean annual temperature of the town ranges from 17.6^0c- 22.5^0c. However, the hottest months of the town are January and February. The average annual rain fall is about 1600-1701mm on during summer season. The Town has four kebeles, with total area of 3256 hectare. The human population in the area is 45109; which comprise 22690 males and 22419 females. The livelihood of most of the town population was earned from small trading, farming, and employment in government and non-government organization according to Areka town municipality (27). The study was conducted from May 12/2015 to December 25/2015.

Study design was community based cross-sectional study**.**
Source population is all children aged 6-59 months and their mothers/ care givers in Areka Town.

Study population is all randomly selected children aged 6-59 months and their mothers/ care givers living -in the selected Gots of kebeles in Areka Town.

Sample Size determination

Sample size was computed using a single population proportion formula with the following assumptions: 95%CI (two-sided), 5% of margin of error, reported prevalence of stunting among under-five children in southern region (44.1%).

n = z2 p (1-p)/d2), where Z = level of confidence (1.96), P = stunting prevalence in southern region (44.1%), d = margin of error (5%), n = sample size (379) HH or children.

Calculation n = (1.96)2 * 0.441 (1-0.441) / (0.05)2 = 379.

Inclusion criteria: All children aged 6-59 months - in the selected households were included in the study.

Exclusion criteria: Children, who were seriously ill, had physical deformities of limbs and spines were excluded because of difficulty in anthropometric measurement.

Sampling procedures

A simple random sampling technique was used to select the study "Gots" from the respective four kebeles with an estimated 3260 children aged 6 to 59 months in the study town. Out of 27 Gots in four kebeles a total of, 13 Gots (3 from kebele 01, 3 from kebele 02, 4 from kebele 03 and 3 from kebele 04) were selected by Simple random sampling. Then, Systematic random sampling method was applied to select study participants using proportional allocation to population size from each "Got".

Dependent Variable: Stunting of children (undernourished)

Independent Variables:

Family size, income, maternal/paternal education and occupation, marital status of the mother, Childhood illness, exclusive breast feeding, immunization, Health status, water supply and sanitation.

Data collection

Socio Demographic and Economic and dietary information were collected using pretested structured questionnaires. The questionnaire was initially prepared in English and then translated into Local Language (Wolaita) then retranslated back to check consistency. The standardized anthropometry measuring scale was used to capture data on the stunting of children aged 6-59 months. To assess the physical growth and nutritional status of the children, measurements of height and weight was taken from all of the children. These measurements were taken during the home visit. A total of 9 data collectors (5 diploma Nurses, diploma in Biology and 2 BSc in Geography) and 1 supervisor (Bsc in Environmental health Science) proficient in the local language were deployed to collect data. The measurement of weight was done of the children with minimum clothing and no shoes to the nearest 0.1kg. Recumbent length measurement was also taken for children under two years of age while for children above two years stature was measured in a standing position shoulders erect with their back of heels, buttocks and head touching the wall in centimeters to the nearest of 0.1cm

Data quality assurance

The data collectors were trained on accurate measuring scale of anthropometry on stunting. To ensure the quality of measurement, first the expert measured five children prior to data collection. Then, each of the enumerators measured the same five children, after some break each of the measures repeated measurements on the same five children. Then the differences between the averages of the two measurements of the measurers from that of the expert measurements were calculated to evaluate technical Error of the measurements (TEM). The relative

TEMs for inter and intra examiners for weight were 0.7% and 1.2% respectively. The relative TEMs for inter and intra examiners for length were 1.8% and 1.7%. All the relative values were above 0.95, the suggested cut-off. This shows that error for measurements in the study was small.
Data validity and reliability was maintained through close supervision by the principal investigator and trained supervisor. To minimize systematic error height and weight of the children were taken twice by the same person and the average value was taken for final analysis.
Five percent of the questionnaires were pretested in other place before the actual data collection. Training was given to data collectors and supervisor prior to the onset of data collection. The collected data were reviewed and checked for completeness and consistency.

Data processing and analysis
First, the data were checked for completeness and consistency for data entry and cleaning. Then, data were entered in the computer using EPI-info version 3.5.2 and exported to SPSS version 21.0 for further analysis; The World Health Organization (WHO) anthros software was used to analyze anthropometric data to determine Z-score. Descriptive statistics such as frequencies, proportions, and cross-tabs were used to present the data. In addition, biviarate logistic regression analyses were done to assess the association between independent variables and dependent variable. Variables which showed significant association (p value ≤ 0.25) in the bivariate logistic analysis were included in the final Multivariable logistic regression model.

Odds ratios along with 95% confidence interval were estimated to identify factors associated with child stunting. P-value less than 0.05 was declared as level of statistical significance **Ethical considerations**

The research and ethics committee of Wolaita Sodo University approved the study protocol and then, Official letter of cooperation was written to Areka Town administration for permission. The nature of the study was fully explained to the study participants. Informed oral and written consent was obtained from mother/ care givers prior to participation in the study . Data were kept confidential throughout the study. Seventeen children who were found severely malnourished during the anthropometric measurement were referred to the nearby health facilities for treatment.

Results

Socio demographic and economic characteristics

A total of 379 children and their mothers / care givers participated in the study making a response rate of 100%. Mean (SD) age was 31(±15.2) months and about 201 (53 %) were females. The mean height/length (±SD) and weight (±SD) of the children were 86.45cm (±11.92) and 12.58 kg (±2.9) respectively. Out of the total households involved, about 196 (51.7%) of the mothers were up to primary education while 96 (25.3%) were uneducated and majority were married 357 (94.2%). About 224(59%) of the children were from households with 4 up to 6 family members while 101 (26.6%) were from 1 to 3 family members. The most common source of drinking water was pipe water 373(98%). About 327(86%) of the children were from households that used improved pit latrine. While 52(14%) were from households that do not used improved pit latrine. table1.docx

Child health and feeding practices: Majority of the study participants, 376 (99%) of children were vaccinated with their age. Two hundred fifty eight (68%) of children have started complementary feeding after six months of age while ninety seven (25.6%) started during six months of age. About 116 (30.6%) of children, experienced diarrhea within the last month prior to the data collection. Table 2.docx

Prevalence of stunting: The prevalence of stunting was 33.2 % (95% CI = 0.3 – 0.4). Out of which 63 (16.6%) were severely stunted and 63 (16.6%) were moderately stunted. The mean (SD) of HAZ was -1.03(±2.2).

Dietary intake of children:
From diet diversity most of the children 360 (95%) consumed starchy staples (made of corn/maize, wheat, millet, kocho (false banana), or any other grains or foods made from these (e.g. bread, porridge or other grain products). Three hundred sixty (95%) study participants reported that children consumed other vitamin A rich fruits and vegetables (pumpkin, carrot, ripe papaya, and other locally available vitamin A rich fruits) 24 hours prior to the survey and most of children 337(88.9%) consumed milk and milk products. About 310(80%) of study participants reported that children consumed other fruits and vegetables this almost similar with another study (44).
Legumes, nuts and seeds were consumed by 332(87.6%) of the study participants. About 318(83%) of study participants reported that children consumed eggs and about 212 (55.9%) and 374 (98.7%) of study participants

consumed meat, meat products and oil or fat, respectively. The mean dietary diversity score of study participants was 2.37 and about 39 (10.3%) of study participants had poor dietary diversity (DDS ≤ 3) and the other 161(42.5%) had medium dietary diversity score (DDS 4-6) where as 179(47.2%) of study participants had good dietary diversity score, DDS ≥7.

Factors associated with nutritional status of children:

Bivariate logistic regression analyses identified educational status of mother [COR = 6.1, 95% CI (2.1-17.6)], family size [COR =4.9, 95% CI (1.6-15)], occupation of mother [COR =5.3, 95% CI (2.2-12.8)], diarrhea [COR =0.7, 95%CI (0.4-1.2)], monthly income [COR = 9.3, 95% CI (1.1-74)], and number of under five children [COR = 1.6, 95% CI (0.7-3.6)], dietary diversity score [COR = 2.7, 95% CI (1.1-6.4)] , sex [COR = 0.6, 95% CI (0.4-1.01)] and age of child [COR = 0.6, 95% CI (0.3-1.4)] were associated factors of child stunting.

In multivariate logistic analysis, educational status of mother was significantly associated with stunting. Educational status of mother had a significant association with the nutritional status (HAZ) of the children, i. e., children who had uneducated mothers were 5.7 times more likely to be stunted than those mothers who had diploma and above [AOR=5.7, 95%CI (1.9-16.7)], Similarly having large family size (7+) was associated with stunting of the children [(AOR=4.9, 95%CI= (1.5-15)]. In addition to this occupation of the mothers was significantly associated with stunting of the children [(AOR=4.5, 95%CI= (1.8-11.2)]table\Table 3.docx

Discussion

The prevalence of stunting was 33.2 % (95% CI = 0.3 – 0.4). In multivariable logistic regression analysis having no formal education [(AOR=5.7, 95%CI= (1.9-16.7)] was associated with stunting. Similarly having large family size (7+) was associated with stunting of the children [(AOR=4.9, 95%CI= (1.5-15)]. Occupation of the mothers was significantly associated with stunting of the children [(AOR=4.5, 95%CI= (1.8-11.2)].

These prevalence rates of malnutrition indicated that the 6-59 months old children of this study area were not in a moderate condition compared to malnutrition reported by a number of other studies [18]. The prevalence of stunting was relatively lower in comparison with the latest Ethiopian Mini Demographic and Health Survey 2014, (40% were stunted) as well as the regional prevalence reported by EDHS 2011, (41.4% stunting)(19).

This study noted that the educational status of mothers, family size and occupation of mother were significantly associated with stunting. Educational status of mother had a significant association with the stunting of the children, i. e., children who had mothers not formally educated were 5.7 times more likely to be stunted than those mothers who had educated [AOR=5.7, 95%CI (1.9-16.7)]. This is consistent with study conducted in Bule Hora district, South Ethiopia. These showed children from mothers not formally educated were positively associated with child under nutrition(10). It is argued that mothers who were educated in the society have higher ability to improve the nutritional status of children while those with no formal education were do not [16&20].

In our study, having large family size was a factor significantly associated with stunting. Children who had family size greater than or equal to seven were 4.9 times more likely to be stunted than those who had less than four family members [AOR=4.9 95%CI (1.5-15)]. This is in line with a study done in Ethiopia [17]. Likewise , a study reported by different scholars showed that the larger the size of the family the poorer the nutritional status of the children would have seen [21-22]. As revealed in previous different research, children in crowded families are more susceptible to malnutrition [24] . As well as food intake and accessibility of healthcare decrease with higher family size especially in low income families [25].

In addition, this study showed Children from households with unemployed mothers were 4.5 times more likely to be stunted than those whose mothers were employed [AOR= 4.5, 95%CI (1.8-11.2)]. In contrary to the study done in urban slams of Guntar, India [26] revealed that unemployed mothers were negatively associated with stunting; however in this study it was found to be at higher risk, this might be due to the economical status of employed mother is good. This might lead to good nutritional status of under five children.

Conclusions

The prevalence of child stunting in this study was found to be moderate in the study area. Educational status of mothers, family size and occupation of mother and age of the children remain key associated factors of stunting.

Recommendations

Stunting was found to be a result of maternal, socio-demographic and child individual factors. These findings are of great importance because they identify potential actions that can be used to improve the nutritional status of children. Immediate interventions targeted to community based management of chronic malnutrition might be appropriate to manage stunting which is an indication of chronic malnutrition in the study. Prevalence of under nutrition may be due to inadequate feeding practice, therefore nutrition education on dietary diversity and family planning should be provided. Special attention should be given to adult literacy program in order to promote adequate feeding practice and to curb chronic nutritional problems.

Community based nutrition program should be strengthened as well as further study should be carried out to explore additional factors that might not be included in this study.

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