Prevalence of Stunting and Associated Factors among Children Aged 06-59 Months In Southwest Ethiopia: A Cross-Sectional Study

Melkamu Beyene Teferi*, Hamid Yimam Hassen, Amanu Kebede, Emebet Adugnaw, Gebrelibanos Gebrekrstos, Mebrahtom Guesh

Mizan-Tepi University, College Of Health Sciences, Department Of Public Health, Mizan Teferi, Ethiopia

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*Corresponding author: Mr. Melkamu Beyene Teferi, Mizan Tepi University, college of Health Sciences, Department Of Public Health.

Tel: +251-910-586-634; Fax: 047 336 03 44; E-mail: melkieb12@gmail.com

Abstract

Introduction: Nutritional Stunting, which is height for age below that expected on the basis of International growth reference, is a very serious type of malnutrition in that it develops slowly through time before it is evident. Stunting is one of the most important public health problems in Ethiopia. The objective of this study is to assess the prevalence of stunting and associated factors among fewer than five children in southwest Ethiopia.

Methods: A community based cross-sectional study was conducted by simple random sampling technique with sample size of 356 among 06-59months children. Interviewer administered structured questionnaires and anthropometric measurement was used to collect data. The data was entered using SPSS version 20 and analysis was done by SPSS version 20. Bivariate and multivariate logistic regression analysis was used. The variables which had significant association were identified on the bases of P values ≤ 0.05 and 95%CI.

Result: A total of 324 children's were participated in the study with a response rate of 91%. In the study, 33.3% of 06-59 months children were stunted in shey bench district. Children aged 12-24months were about 0.06 times [AOR 0.06; 95CI (0.02-0.08)] and children above 24 months were 0.12 times [AOR 0.12; 95 % CI (0.03-0.56)] less likely to be affected by stunting respectively. Children who had born less than 2 years interval were 2.31 times more likely to be affected by chronic malnutrition [AOR 2.31; 95 % CI (1.43- 3.08)]. Children who had started complementary feeding at less than six months or above six months were 3.78 [AOR 3.78; 95 %CI (1.39-4.25)] times more likely to be affected by stunting than those started complementary feeding at the age of 6 months.

Conclusion and recommendation: The result of this study described that the prevalence of stunting among children age 06-59 months was relatively high (33.3 %). Children age, age at which complementary feeding started and birth interval were found to be associated factors of stunting. Promoting appropriate maternal feeding at pregnancy including optimal breast feeding, timely starting of complementary feeding and exceeding of birth interval more than 24 months is essential to prevent stunting (chronic malnutrition) among under five children.

Keywords: Stunting; Under Five Children; Factors; Shey Bench District; Ethiopia;

Background

The term malnutrition generally refers both to under nutrition and over nutrition, but in this situation we use the term to refer solely to a deficiency of nutrition. Many factors can cause malnutrition, most of which relate to poor diet or severe and repeated infections, particularly in underprivileged populations. Inadequate diet and disease, in turn, are closely linked to the general standard of living, the environmental conditions, and whether a population is able to meet its basic needs such as food, housing and health care [1, 2].

Malnutrition among the under-5 years is a leading factor underlying child mortality in Sub-Saharan Africa, and contributes to 2.2 million deaths and the overall status of health and health care practices of all disability adjusted-life-years lost worldwide for children under five years old [2, 3].

Malnutrition continues to be a major public health problem in developing countries. It is the most important risk factor for the burden of many diseases [4-6]. In Ethiopia, child malnutrition rate is one of the most serious public health problem and the highest in the world. High malnutrition rates in the country pose a significant obstacle to achieving better child health outcomes [7-9].

Nutritional Stunting, which is height for age below that expected on the basis of International growth reference, is a very serious type of malnutrition in that it develops slowly through time before it is evident. The high prevalence of stunting among the children reflects inadequate health services, poor water and sanitation, poor maternal and child care practices and insufficient access to food. This is caused by poor health service delivery at village level and subsequent health system levels. Nutritional status is the result of complex interactions between food consumption and the overall status of health and health care practices [10, 11].

Numerous socioeconomic and cultural factors influence patterns of feeding children and nutritional status of women and children. The period from birth to age two is especially important for optimal growth, health, and development. Unfortunately, this period is often marked by micronutrient deficiencies that interfere with optimal health, growth and development [12, 13].

Improving overall nutritional status throughout the life cycle is crucial to maternal and child health. Women who become malnourished during pregnancy and children who fail to grow and develop normally due to malnutrition at any time during their life, including during fetal development, are at increased risk of prenatal problems, increased susceptibility to infections, slowed recovery from illness, and possibly death. Improving maternal nutrition is crucial for improving children's health. The poor nutritional status of children and women has been a serious problem in Ethiopia for many years [14].

Even though Child malnutrition remains one of the most important concerns of the world including Ethiopian government only few studies done at national and regional levels, the prevalence and risk factors at sub-regional or community level have been insufficiently emphasized, which makes interventions difficult in such circumstances. For example, according to the 2011 DHS, the prevalence of stunted, wasted and underweight children in the region (SNNPR) was 44.1%, 7.6% and 28.3%, respectively, indicating that there are several zones and districts with higher prevalence rates than the regional average [9].

Having this in mind, the aim of our study was to determine the magnitude of chronic malnutrition and identify the major factors associated with it that will guide a good intervention approach to halt the problem.

Methodology

Study Design, area and period

A community based cross-sectional study was conducted to assess the prevalence of stunting among under five children. The study was conducted at shey Bench district from April 1 to May 30, 2016. shey bench is located about 593 Kilo meter from Addis Ababa (capital city of Ethiopia) in southwest direction. Based on central statistical agency in 2010 this town has an estimated total population of 27, 975 of which 13002 men, 14973 women and 4210 under five children.

Source Population and sampling

The Source population was children (06-59 months) of age who lived with their mother's or caregivers in the house holds of Shay Bench district. The Study populations were children 06-59 months of age who lived with their mothers or care givers in the sampled kebeles of Shay Bench district. All children among age of 06-59 months in Shay Bench town were included and Children who are critically sick and that makes difficult to take anthropometric measurement were excluded. For sample size calculation we use single population proportion formula considering the following assumptions: 95% confidence level, proportion (p) of stunting 35% studied in Benchi Maji zone and 5% margin of error (d).

$$n_i = \frac{(1.96)^2(0.35)(0.65)}{(0.05)^2} = 350$$
 Since the source population is 4210 which is less than 10,000 we need to adjust the sample size. Final (n) = $n_i / 1 + n_i / N$, Where N is the source population. $n = 350 / 1 + 350 / 4210 = 324$. By adding 10 % non respondent rate the final required sample size was 356. Lists of children aged between 06 and 59 months along with their mothers residing in all kebeles (the smallest administrative unit) of shey bench district were taken from health extension workers and then sampling frame was constructed for each kebeles. Simple random sampling technique was used to select a sample of 356 children proportionally from all kebeles by using lottery method.

Data Collection Procedure and Tools

For a Socio economic and demographic, Dietary, Environmental and Health care characteristics data was collected face to face interviewing mothers/care takers by using a structured questionnaire which is adopted from other similar studies. Anthropometric Measurements was collected using the procedure stipulated by the WHO (1995) for taking Anthropometric measurements. Adherence to this procedure was ensured. The protocol used was as follow.

Length: - Length measurement for children less than 24 months was made by laying flat on the length board. The sliding piece was placed at the edge of the bare feet and at the head (with crushing of the hair) touched the other end of the measuring device.

Height: - Height was taken in a standing position for children greater than 24 months. The measurement was taken to the nearest 0.1 cm using short height measuring board.

Operational Definition

Stunting was defined as HAZ < minus two Z-score based on WHO reference group.

Data Quality Assurance, Processing and Analysis

Before the actual data entry was started completeness, accuracy, and consistency of the collected data were checked on daily basis during data collection by the principal investigators. Data were entered, cleaned and analyzed by using SPSS version 20.0 statistical software. Descriptive statistics were done and presented by using tables and figures. Bivariate logistic regression analysis was used to assess the association between each independent variable with the dependent variables. Those variables that have been associated with the dependent variables at p-value of less than 0.2 were fitted in to multivariate logistic regression models to control the effects of confounding. Those variables having p- value of less than 0.05 was considered as significant.

Results

Characteristics of the sample

A total of 324 children aged 06 to 59 months along with their mothers/care givers were enrolled in the study, with a response rate of 91 %. For all parental and children socio-demographic

characteristics see Table 1. Among the children, 126(38.9%) were found in the age group of between 12-24 months. The mean age was 27.77 ± 14.78 SD months. 164(50.6%) were female.

Environmental, Health care and children feeding Characteristics of children and parents

From the total households 150(46.3%) of them had water

Table 1: Socio-demographic and economic characteristics of parents and children among 06-59 months age in Shay Bench district, southwest Ethiopia, 2016 (n=324).

Characteristics	Frequency (n)	Percentage (%)
Sex of the child		
Male	160	49.4
Female	164	50.6
Children age in month		
6-11	86	26.5
12-24	126	38.9
>24	112	34.6
Mothers age at pregnancy		
<20	86	26.5
20-35	219	67.6
>35	19	5.9
Marital status of the mother		
Married	260	80.2
divorced	32	9.9
Widowed	17	5.2
Single	15	4.6
Ethnicity		
Bench	110	34
Kefa	77	23.8
Amhara	67	20.7
Oromo	42	13
Gurage	18	5.6
Others	10	3.1
Religion		
Protestant	96	29.6
Orthodox	181	55.9
muslim	45	13.9
Others	2	0.6
Educational status of a mother		
No education	102	31.5
Primarily	152	46.9
Secondary	37	11.4
Higher institution	33	10.2
Education status of a father		
No education	54	18.5
Primarily	118	41.5
Secondary	70	23.8
Higher institution	46	16.2
Occupational status of a mother		
House wife	195	60.2
Government employee	28	8.6
Non government employee	9	2.8
merchant	44	13.8
Self employee	40	12.3
Others	8	2.5
Family monthly income		
<1500	229	70.7
>= 1500	95	29.3

source from public pipe, 306(94.4%) households have Functional toilet. Of the total children mothers 157(48.5%) had ANC visit of 2-3 times during their pregnancy, 265 (81.8 %) give birth at health institutions and 100(30.9%) of the mothers had no post natal care visit. From the total study participants 192(59.9%) of children had birth weight of 2.5-4 kilogram and 123 (38%) of children were in the second and third birth order. Among study participants 263(81.2%) of children were fully immunized and 69(21.3%) had fever, 81 (25%) had diarrhea in the past two weeks.

Among 324 children 321(99.1%) were breast fed, 312(96.3%) initiated to breast feed within one hour of delivery and 84 (25.9 %) of children had started complementary feeding at age of 6 months. For all environmental, health care and child feeding characteristics see table 2 below.

Prevalence of stunting among 06-59 months children

Based on WHO criteria the prevalence of stunting among children of 6-59 months in shey bench district is 33.3%.

Factors associated with stunting among 6-59 months children

Multivariate logistic regression analysis revealed that age of the child, preceding birth interval and age at which complementary feeding started were associated with stunting at p value <0.05. Children aged 12-24months were about 0.06 times less likely to be affected by stunting [AOR0.06; 95CI (0.02-0.08)] and children above 24 months were 0.12 times less likely to be affected by stunting [AOR0.12 ; 95 % CI(0.03-0.56)] compared to children aged 6-11 months.

Children who had born less than 2 years interval were 2.31 times more likely to be affected by chronic malnutrition [AOR 2.31; 95 % CI (1.43- 5.08)] as compared with children who had born more than 2 years interval.

Children who had started complementary feeding at less than six months or above six months were 3.78 [AOR 3.78; 95 %CI (1.39-5.25)] times more likely to be affected by stunting than those started complementary feeding at the age of 6 months.

Discussion

Nutritional Stunting, which is height for age below that expected on the basis of International growth reference, is a very serious type of malnutrition in that it develops slowly through time before it is evident.

This study intended to assess the prevalence of stunting and associated factors among 6-59 months children in shey bench district. Based on this study the prevalence of stunting was 33.3%; 95%CI. This study was in line with the study conducted in Mizan Aman town, 34.5%, in Hosanna (35.4%) and Bangladesh (34.4%) [15-17]. the prevalence is higher than the study conducted by Ethiopian Base line survey 2010, (25%) [8] And the study conducted in Somali region (17.2%) [18]. However, the prevalence of stunting in the study area was lower than the study conducted in north shoa (47.6 %), in Lalibela (47.3%) and Vietnam (44.3%) [19-21]. the prevalence of stunting in the study

Table 2: Environmental, health care and child feeding characteristics of children among 5 to 59 months in Shay Bench district, southwest Ethiopia, 2016 (n=324)

Characteristics	Category	Frequency (n)	Percent (%)
Main source of water	Private pipe	91	28.1
	Public pipe	150	46.3
	Boon water	8	2.5
	Protected well	63	19.4
	Unprotected well	12	3.7
Availability of toilet	Yes	306	94.4
	No	18	5.6
Frequency of ANC follow up	none	17	5.2
	1	43	13.3
	3-Feb	157	48.5
	>3	107	33
Place of delivery	Health institution	265	81.8
	home	59	18.2
PNC	Yes	224	69.1
	No	100	30.9
Birth weight of a child	<2.5 kg	60	18.5
	2.5 -4 kg	194	59.9
	>=4 kg	70	21.6
Birth order of a child	1	120	37
	3-Feb	123	38
	5-Apr	44	13.6
	>5	37	11.4
Birth interval of a child	<2 years	216	66.7
	>2 years	108	33.3
Ever breast feed child	Yes	321	99.1
	No	3	0.9
initiation of breast feeding	Within one hour	312	96.3
	After one hour	12	3.7
Child feed colostrums	Yes	256	79.9
	No	65	20.1
Duration of breast feed	<12 months	44	13.6
	12-24 months	243	75
	>2 4 months	37	11.4
complementary food started	At 6 months	84	25.9
	<6 and >6 months	240	74.1
Feeding material	spoon	123	38
	cup	55	17
	hand	47	14.5
	Bottle	99	30.5
History of pre lacteal feeding	Yes	49	15.1
	No	275	84.9
Immunization status	Fully immunized	263	81.2
	on immunization	25	7.7
	Not immunized	36	11.1
Fever for the last two weeks	yes	69	21.3
	No	255	78.7
Diarrhea for the last weeks	Yes	81	25
	No	243	75
Frequent diarrhea	Yes	49	15.1
	No	275	84.9

Note: All of the characteristics related to health care and feeding practice is concerning to index child.

area was also lower than a research conducted in Bule hora, southern Ethiopia (47.6%) [22].

The difference in prevalence might be due to this might be due to difference in method used, sample size variation and child feeding practice of the community.

According to this study, Childs age was one of the socio demographic factors associated with stunting in the study area. Children at the age of 6 -11 months were more likely to be stunted than those children in the age of 12-24 months and greater than 24 months.

This study was in agreement with the study conducted in Lalibela town [20], in Hosanna [16] and in Mizan Aman town [15] and not in agreement with the study conducted in Bule hora district,south Ethiopia [22].

This might be due to poor nutritional status of mother's at pregnancy, inappropriate infant and young child feeding practices including breast feeding and complementary feeding and other related factors which were needed to be undergone beginning from conception, through a mother's pregnancy and up until the age of one which was the most critical period in a child's development after child reaches above 24 months of age stunting was irreversible.

Another factor associated with stunting in the study area was age at which complementary feeding started. The result of this study revealed that children who had started complementary feeding at the age of below or above 6 months were more likely to be stunted than those who had started complementary feeding at the age of 6 months.

The association of this dietary factor with stunting was in line with the study done in Meskan district, Gurrage zone, southern Ethiopia [23].

This might be due to inappropriate timing for introducing some kinds of complementary food to a child may affect his/her nutritional status because his/her digestive and immune systems are not yet mature. Introducing supplements before earlier, especially under unhygienic conditions, could be predisposing factor for infection and it leads to malnutrition.

The other factor that was significantly associated with stunting was preceding birth interval of the child Children who had preceding birth interval of less than 24 months were more likely to be stunted than children with preceding birth interval of greater than or equal to 24 months. This result was in line with a study conducted in Mizan Aman town and harerge zone [15, 24]. This might be due to the child may not be breast feed up to 24 months and a mother may not be feed and give care appropriately due to her second early pregnancy.

Conclusion

The result of this study described that the prevalence of stunting among children age 6-59 months was relatively high

Table 3: A bivariate and multivariate logistic regression output showing factors associated with stunting among 06 to 59 months children, shey bench district, southwest Ethiopia, 2016.

Characteristics	Stunting			
	Yes	No	COR (95%CI)	AOR(95%CI)
Age of children in month				
6-11	23 (6.5)	63(93.5)	1	1
12-24	50 (47.6)	76 (52.4)	0.55 (0.21-0.86)	0.06 (0.02-0.08) *
>24	35(29.6)	77 (70.4)	0.80 (0.28-0.76)	0.12(0.03-0.56) *
Birth order of index child				
1	37 (30.8)	83 (69.2)	1	1
2-3	31 (25.5)	92 (74.8)	7.29 (2.28-3.86)	2.01 (0.99-2.17)
4-5	27 (61.3)	17 (38.7)	9.64 (2.93-3.78)	1.61 (0.43-1.03)
>5	13 (35.1)	24 (64.9)	4.45 (1.31-5.17)	1.05 (0.89-2.91)
Birth interval of index child				
>24 months	44 (41.12)	64 (58.88)	1	1
<24 months	63 (29.17)	153 (70.83)	1.69 (1.03-3.09)	2.31 (1.43-3.08) *
Educational status of a father				
No education	15 (22.1)	53 (77.9)	1	1
Primary education	57 (48.7)	60 (51.3)	0.46 (0.18-1.17)	0.3 (0.12-1.21)
Secondary education	28 (40V.0)	42 (60.0)	0.14 (0.61-0.31)	o.01 (0.83-1.45)
Higher institution	8 (11.6)	61 (88.4)	0.20 (0.82-0.47)	0.25 (0.94-1.01)
Age of complimentary feeding started				
At 6 months	36 (40)	48 (60)	1	1
<6 or >6 months	91 (37)	149 (63)	1.23 (1.01-3.89)	3.78 (1.39-4.25) *

AOR =Adjusted Odd Ratio, COR= Crude Odd Ratio, CI= Confidence Interval and *= significant variables

Figure 1: Prevalence of stunting among children 6-59 months age in Shey Bench district, southwest Ethiopia, 2016.

(33.3 %) as compared with other studies. Children age, age at which complementary feeding started and birth interval were found to be associated factors of stunting. Promoting appropriate maternal feeding at pregnancy including optimal breast feeding, timely starting of complementary feeding and exceeding of birth interval more than 24 months is essential to prevent stunting (chronic malnutrition) among under five children.

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collection. We also acknowledge study participants and their parents for giving the required information.

Ethical consideration

Ethical approval was obtained from the college of Health sciences, Mizan-Tepi University. Officials of each Facility were also contacted, and permission was granted to conduct the study. Informed written consent was obtained from participants for their participation and the right to withdraw from the study at any time was also communicated to all of them. Undernourished children were referred for to nutritional rehabilitation center according to the national guideline.

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