

Malnutrition and associated factors among under five children (6-59 Months) At Shashemene Referral Hospital, West Arsi Zone, Oromia, Ethiopia.

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Abstract

Background: Malnutrition is alarmingly decreasing the two-decade, but still major public health problems in the world, especially in developing countries, include Ethiopia. Stunting and wasting rates are dropping, but 159 million and 50 million children around the world still affected respectively. Malnutrition in Ethiopia in the form of stunting, underweight and wasting were as 44%, 29% and 10% and Oromia national region state 44.1%, 39.6% and 12.5%, respectively under five children.

Objective: the aim of this study is to assess magnitude of malnutrition and associated factors among under-five children in Shashemene Referral Hospital, Oromia Ethiopia, 2016.

Method: Facility based cross-sectional design was conducted. Systematic random sampling technique was used. After data collection SPSS 20.0 was employed for data entry, organize and analysis. Odd ratio and p value were computed to identify the presence and strength of association and <0.05 statistical significance was declared.

Results: The magnitude of stunting, underweight and wasting were about 38.3%, 49.2% and 25.2 %, respectively. Educational status of mother and child age was significantly associated with stunting. Complementary food was associated with underweight and occupation of mother was associated with wasting.

Conclusion and recommendation: This study revealed that malnutrition was high than the regional and national figures found from Ethiopian Demographic Health Survey 2011. Community based nutrition program need to be established to tackle the problem of malnutrition at community level depending on the severity of malnutrition identified in this study. Nutrition education by health extension works need to be strengthening to improving the feeding practice of parents on appropriate children feeding.

Keywords: Malnutrition, Under-five in Ethiopia.

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Introduction

Malnutrition is alarmingly decreasing the two-decade, but still major public health problems in the world, especially in developing countries, include Ethiopia. Stunting and wasting rates are dropping but 159 million and 50 million children around the world still affected respectively [1]. Malnutrition is attributed one third of under-five death in the first five years of live, which is preventable by economic growth [2]. Globally, one out of every 13 children were wasted, which is 16 million children were severely wasted [1]. Children malnutrition affects academic performance, physical and mental development throughout their lives [2,4]. Under-five malnutrition

is an indicator of one's counties health status as well as economic conditions [5]. Malnutrition among children is a critical problem because its effects are long lasting and go beyond childhood. It has both short and long term consequences [6,7]. Malnutrition especially under five still devastating problems in developing countries, especially in sub-Saharan Africa, including Ethiopia [8]. Stunting, wasting, and underweight are among those anthropometric indicators are commonly used to measure malnutrition of under five children. Underweight (low weight-for-age) reflects both low height-for-age and low weight-for-age and therefore reflects both cumulative and acute exposures of malnutrition [9]. Ethiopia has a high prevalence of Acute and chronic malnutrition, with almost half of

Ethiopian children chronically malnourished and one-in-ten children wasted. About 47% of children under-five are stunted, 11% are wasted and 38% are underweight [10]. Epidemiological studies were conducted in developing countries have identified several factors associated with under nutrition, including low parental education, poverty, low maternal intelligence, food insecurity, rural residence and sub-optimal infant feeding practices [4,11]. Nearly half of death under-five is attributable by malnutrition. Malnutrition puts children at greater risk of dying from common infections, increases the infection and delayed recovery. Poor nutrition in the first 1,000 days of a child's life can also lead to stunted growth, which is irreversible and associated with impaired cognitive ability and reduced school and work performance [12]. An estimated 53% of infection death is the effect of malnutrition on diseases such as measles, pneumonia, and diarrhea [13,14]. Underweight and stunting rates among young children are the highest in sub-Saharan Africa. About two in five children (38%) are underweight, 10.5% of the children are wasted (2.2% are severely wasted) and 46.5% of the children are stunted that half of them are severely stunted [15]. Malnutrition in Ethiopia is serious and 44% of children were stunted, 10% wasted and 29% underweight with wide regional variations [16-18].

Methods and Materials

The study was conducted in Shashemane Referral Hospital from April 1 to May 24, 2016. Shashemane Referral Hospital is located about 240 km from the capital, Addis Ababa. It is one of the hospitals that provide health service including screening for malnutrition in Shashemene and surrounding area. The study population were systematically selected under-five children and their caregivers who utilize under-five OPD at Shashemane Referral Hospital. Children under five years of age, who were visit the OPD at Shashemane referral Hospital and their care givers (mother, foster who live with the child at least for 6 months), were interviewed. Children who are severely ill and admitted were excluded. Facility based cross sectional was employed. The sample size was determine by using single population proportion with 95% confidence interval and marginal error of 5%, by taking a maximum value of 50%. The required sample sized was 384. Non response rate of 10% that means 38 sample sizes was added. The total sample size was 422.

Shashemene referral hospital was selected by simple random sampling methods. The number of Under five children who have been attended an under five OPD were counted for the last six consecutive month and found to be 2350, then we were taken average two month divided by total sample size 422 to get "K" value. Then K equal to 5.6. The first day was started arbitrarily, then proceed every "6" value. Then, the data was collected daily every 6 under five OPD patients until the total sample size was finished. Pre-tested an anonymous interviewed structured questionnaires were prepared after reviewing

different relevant literatures. The questionnaires were first prepared in English and then translated to Amharic, the local language of the respondents in the study area. The questionnaires were administered to all under five OPD patients during the data collection period, and who met the inclusion.

Anthropometric Measurements

Length was taken for those less than two years old children in recumbent position and the height for those above two years children in erect position. 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 stature will be measured in a standing position in centimeters to the nearest of 0.1 cm. The weight was taken using the weighing scale. For those children who can't stand weighed with their mother and the mother's weight was subtracted. The weighing scale was adjusted before each measurement. Weight was measured with minimum clothing and no shoes using a weighing scale in kg to the nearest of 0.1 kg. Only children under 110 cm (proxy for 5 year) and over 65 cm (proxy for 6 month) will be questioned to ascertain age using detail season calendar and the presence or absence of pitting edema was checked by pressing child's foot bilaterally.

Weight-for-Age

Reflects body mass relative to chronological age; Often used if the child is normal, under or over weight. It is a simple index but does not consider height. It is influenced by both the height (height-for-age) and weight (weight-for-height) of a child and its composite nature makes interpretation complex. For example, weight-for-age fails to distinguish between short children of adequate body weight and tall, thin children.

Weight-for-Height

Reflects body mass relative to height; It is a measure of acute or short term exposure to a negative environment. It is sensitive to calorie intake or the effects of disease. Wasting (thinness) reflects a deficit in tissue and fat mass and indicates that the child don't weigh as much as they should for their height. In most cases a recent and severe process of weight loss, which is often associated with acute starvation and/or severe disease. It is the first response to nutritional and/or infectious insult.

Height-for-Age

Reflects height relative to chronological age; It is used to tell if a child is the normal height for age. Stunted growth (shortness) reflects failure to reach linear growth potential (pre and postnatal) as a result of sub-optimal health or nutritional conditions. On a population-wide basis, high levels of stunting are associated with poor socio-economic conditions and increased risk of frequent and early exposure to adverse conditions such as illness and/or inappropriate feeding practices. It is assumed to indicate long term, cumulative effects

of inadequate nutrition and poor health status. It is a measure of past nutrition condition. The worldwide variation of the prevalence of low H/A is considerable, ranging from 5 percent to 65.

Data Collection and Data Quality Control Measures

To maintain the quality of data questionnaires was prepared in English and translated in to Amharic and again translated to English to ensure consistency and reliable. The data were collected by 4th year five midwifery students by face to face interviewed methods. To ensure the quality data pretest was done in Melkaoda hospital by using 5% of sample size to check validity and reliable. Every day filled data was checked incompleteness and inconsistency by principal investigators.

Data Analysis

To ensure the quality of data, all filled questionnaires were checked incompleteness and inconsistency. Data were entered using Epi Info version 3.5.1 and exported to SPSS version 20.0 for statistical analysis. Descriptive statistical analysis was used to compute frequency, percentage and mean for independent and dependent variables. Binary logistic regression analysis was used to ascertain the association between explanatory variables and outcome. Variables with significant association in the bivariate analysis were entered into multivariate analysis to determine factors associated with malnutrition. Variables with P value less than 0.05 was considered as statistically significant. Finally the results were presented in texts, tables and graphs.

Ethical Consideration

Ethical clearance was obtained from Hawassa University College of Medicine and Health Sciences were taken to Shashemane Referral Hospital administer office and permission was obtained and then a brief explanation of the purpose of the study was explain and individual verbal consent was obtained from the mother or any one with child before starting the interview or taking body measurements. Those respondents who were not willing to participate in the study were not forced to be involved. The respondent was also being informed that all data obtained from them were kept confidential by using coding instead of any personal identifiers and is meant only for the purpose of the study.

Results

Demographic and Socio-Economic Characteristics

From the total planned study subjects, complete response was obtained 384 (91%). Three hundred four (79.2%) of the respondents were female and 80 (20.8%) of the respondents were males. Three hundred forty eight (90.6%) respondent were married. Majority of respondents were Oromo ethnic group 225 (58.6%). The study subjects religious were 142 (37%) were Muslim and 127 (33%) were protestant. Family size of the study subjects were

148 (38.5%) had less than five family size while 263 (68.5%) of participants had under five child. Educational status of the participants were 130 (33.9%) of mothers and 45 (11.7%) of fathers had no formal education. About 144 (37.5%) of mothers and 144 (37.5%) of fathers were completed grade 1-8 (Tables 1 and 2).

Characteristics and Caring Practice of Children

Among the children 6-59 months of age 124 (33.1%) and 66 (17.2%) children were found in the age groups of 12-23 and 6-11 months respectively. The mean ages of children were 24.4 with SD of 13. The study subjects 278 (72.4%) children were delivered at health facilities and 106 (27.6%) of children were delivered at home. Regarding breastfeeding 234 (60.9%) of children were still breast feeding at the time of survey. The magnitude of common childhood illness 75 (19.5%) of children had diarrhea in the last two weeks before study conducted.

Child Caring Practice

The study subjects 285 (74.2%) were initiated breast feeding practice immediately after birth. In addition to initiation of breastfeeding practice and 40 (10.4%) were received pre lactation food or fluids like Butter 14 (3.6%) and milk 2 (1%). Two hundred eighty five (74.2%) children were exclusively breastfeed until six month. However, 89 (23.2%) of children were mixing feeding started. From the participants 346 (90.1%) of children were immunized and 38 (9.9%) of children were not immunized (Table 3).

Maternal Characteristics

The age of mothers were 32.1 (\pm 6.7SD) years and mean age of first and youngest children birth were 29.8 (\pm 6.6SD) and 30.1 (\pm 6.8SD), respectively. Almost 321 (83.6%) of mothers did not take extra food during pregnancy. About 303 (78.9%) of mothers visited health facilities for ANC during pregnancy. Regarding the use of family planning 279 (72.7%) mothers were used family planning and majority of mothers 193 (50.3%) were used injectable contraceptives (Table 4).

Environmental Health Characteristics of Households

The main source of drinking water used by households were 177 (46.1%) private pipe water, 97 (25.3%) protected spring, 47 (12.2%) public tap, 34 (8.9%) pound, 27 (7%) private well and 2 (0.5%) river water. The study subjects 204 (53.1%) of households were required greater than 50 liters of water per day. The participants 142 (37%) of Households were treat water to make it safe to drink. Concerning about toilet facilities, majority of households 382 (99.5%) had latrine. In this study, wooden slap of latrine 167 (43.5%) were the most commonly being utilized and almost all households were wash hand after toilet, especially by using soap. Regarding waste disposal system 129 (33.6%) and 100 (26%) households were dispose garbage in a pit and open field respectively (Figure 1 and Table 5).

Table 1. Sociodemographic characteristics under five children families

Variables		Frequency	Percent
Sex of respondent	Male	80	20.8
	Female	304	79.2
Marital status	Married	348	90.8
	Divorced	28	7.3
	Widowed	8	2.1
Ethnicity	Oromo	225	58.6
	Amhara	53	13.8
	Wolayta	47	12.2
	Tigray	28	7.3
	Gurage	28	7.3
Religion	Muslim	142	37
	Protestant	127	33
	Orthodox	107	27.9
	Catholic	8	2.1
Family size	<5	148	38.5
	>5	236	61.5
Number of under 5	1	263	68.5
	2-3	121	31.5
Maternal education	Non formal education	130	33.9
	Grade 1-8	144	37.5
	Grade 9-12	62	16.2
	Diploma	40	10.4
	Degree and above	8	2.1
Paternal education	Non formal education	45	11.7
	Grade 1-8	144	37.5
	Grade 9-12	119	31
	Diploma	51	13.3
Occupation of mother	Degree and above	25	6.5
	Housewife only	243	63.3
	Farmer	2	0.5
	Merchant	81	21.1
	Gov.t employee	48	12.5
Occupation of father	Daily labour	10	2.6
	Farmer	113	29.4
	Merchant	129	33.4
	Gov t employee	99	25.8
	Private business	35	9.1
Monthly income of the family	Daily labour	4	1
	<1254	90	23.4
Ownership of livestock	>1254	294	76.6
	Yes	195	50.8
Type of livestock	No	189	49.2
	Cow milk	126	32.8
	Oxen or bulls	34	8.9
	Hen	20	5.2

Table 2. Characteristics of children age 6-59 months

Variables	Frequency	Percent	
Sex of child	Male	184	47.9
	Female	200	52.1
Child age	6-11	66	17.2
	12-23	124	33.1
	24-35	100	26.4
	36-47	65	15.8
	48-59	31	6.9
Place of delivery	Home	106	27.6
	Health institution	278	72.4
Gestational age at birth	<9 month	33	8.6
	At 9 month	184	47.9
	>9 months	167	43.5
Type of birth	Single	279	98.7
	Twin	5	1.3
Still breast feed the child	Yes	234	60.9
	No	150	39.1
Reason for not breast feed	Maternal health problems	8	2.1
	Refusal of child	136	35.4
	Maternal pregnancy	6	1.6
Diarrhea	Yes	75	19.5
	No	309	80.5
Frequency of diarrhea per 2 week	1 episode	37	9.6
	2 episode	38	9.9
Fever	Yes	34	8.9
	No	350	91.1

Table 3. Children caring practice

Variables	Frequency	Percent	
Initiation of breast feeding to the child	Immediately	285	74.2
	After a hour	73	19
	After a day	26	6.8
Child pre lactation food or fluid	Yes	40	10.4
	No	344	89.6
Type of pre lactation food or fluid	Butter	14	3.6
	Milk	2	1
	Water	16	4.2
Complementary food started	<6 months	89	23.2
	6-12 months	285	74.2
	>12 months	8	2.1
	3-5 times	76	19.8
Immunization	6-8	52	13.6
	Yes	346	90.1
	No	38	9.9

Table 4. Under five children’s maternal characteristics

Variables		Frequency	Percent
Age of mother in years	20-29	147	38.3
	30-39	152	39.6
	40-49	85	22.2
Extra food during pregnancy	Yes	63	16.1
	No	321	83.9
Visit health facility	Yes	303	78.9
	No	81	21.1
Family planning used	Yes	279	72.7
	No	105	27.3
Type of family planning used	Injectable	193	50.3
	Implant	38	9.9
	Pills	58	15.1
	Condom	2	0.5

Table 5. Environmental health characteristics of households

Variables		Frequency	Percent
Amount of water used per day	<50	204	53.1
	>50	180	46.9
Treat water by any means	Yes	142	37
	No	242	63
Availability of latrine	Yes	382	99.5
	No	2	0.5
Materials used to wash hands after toile use	Water only	94	24.5
	Sometimes with soap	139	36.2
	Always with soap	102	26.6
	Sometimes with ash	49	12.8
Method of waste disposal	Open field	100	26
	In apit	129	33.6
	Common pit	70	18.2
	Composing	24	6.3
	Burning	61	15.9

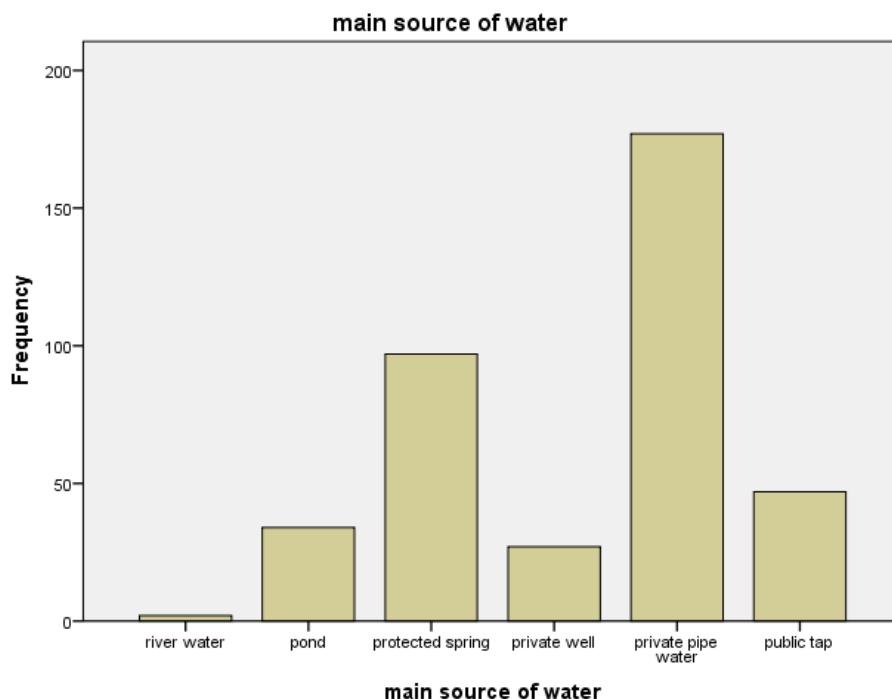


Figure 1. Main source of drinking water

Magnitude of Malnutrition among Children Aged 6-59 Months

The overall magnitude of malnutrition of children among children 6-59 months in study area were 38.3% stunted, 49.2% were underweight and 25.5% were wasted (Figure 2). The highest magnitude of malnutrition children aged 6-59 months were seen in females. Compared with age groups, the highest magnitude of stunting was children age 24-35 months (9.9%) followed by children aged 12-23 months (9.6%). However, the lowest magnitude of stunting was seen in children aged 48-59 months (3.1%) (Figure 3).

The highest magnitude of underweight was seen in children aged 12-23 months with magnitude of 14.5%. However, the lowest magnitude of underweight was seen in children aged 48-59 months with magnitude of 4.9% (Figure 4).

The highest magnitude of wasting was seen children aged 24-35 months with 9.1% magnitude. The lowest magnitude of wasting was seen in children aged 48-59 months with magnitude of 2% (Figure 5).

Factors Associated with Malnutrition among Children Age 6-59 Months

Associated factors of stunting: Children whose mother were completed grade 9-12 were 0.3 times less likely to be stunted than children whose mother had non-formal education (AOR=0.3 (0.14,0.6) 95% CI) (Table 6).

Associated factors of underweight: Children 36-47 months of age were about 0.2 times less likely underweight as compared to other children (AOR=0.2 (0.07,0.6); 95% CI). Children who eat atmit or bula or soup as a complementary food were 2.8 times more likely underweight as compared breast feeding (AOR=2.8 (1.3,5); 95% CI) (Table 7).

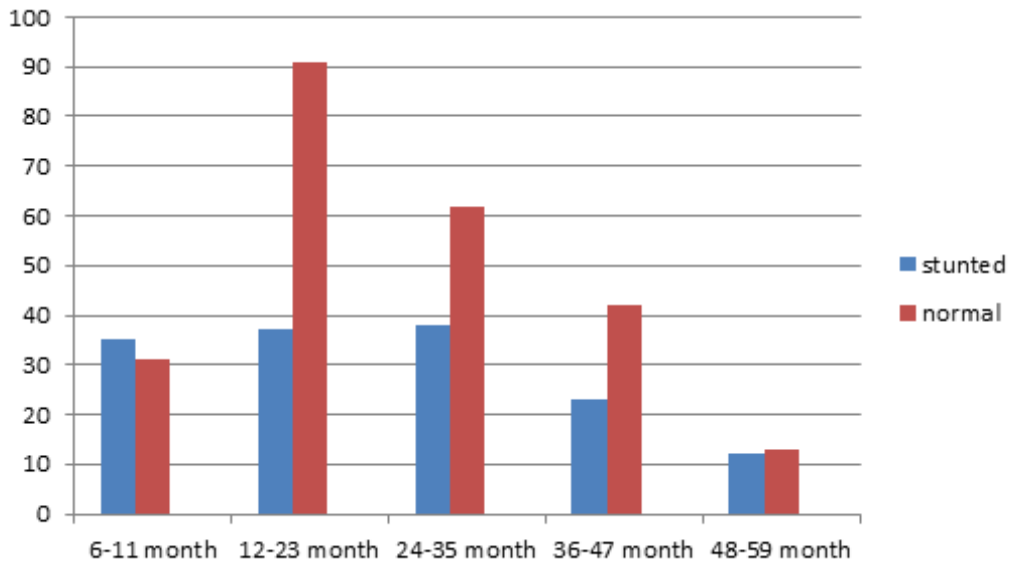


Figure 2. Magnitude of malnutrition among children aged 6-59 month

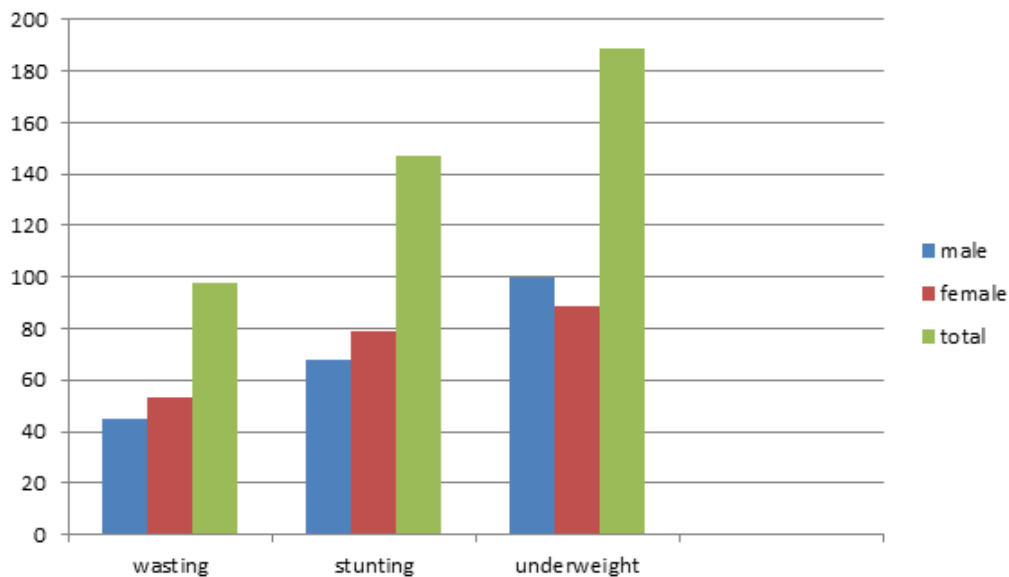


Figure 3. Magnitude of stunting by age among children aged 6-59 month

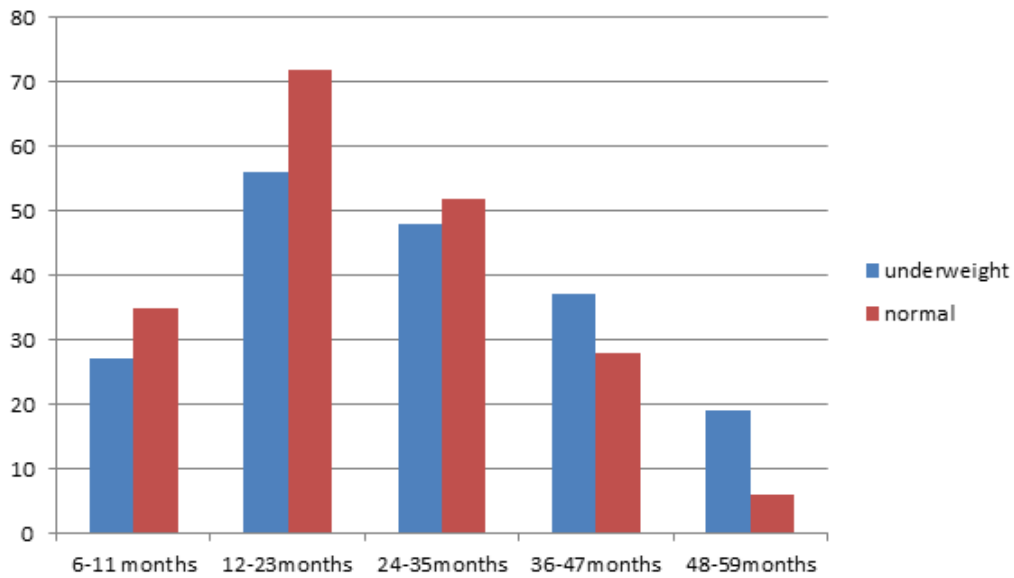


Figure 4. Magnitude of underweight age among children aged 6-59 months

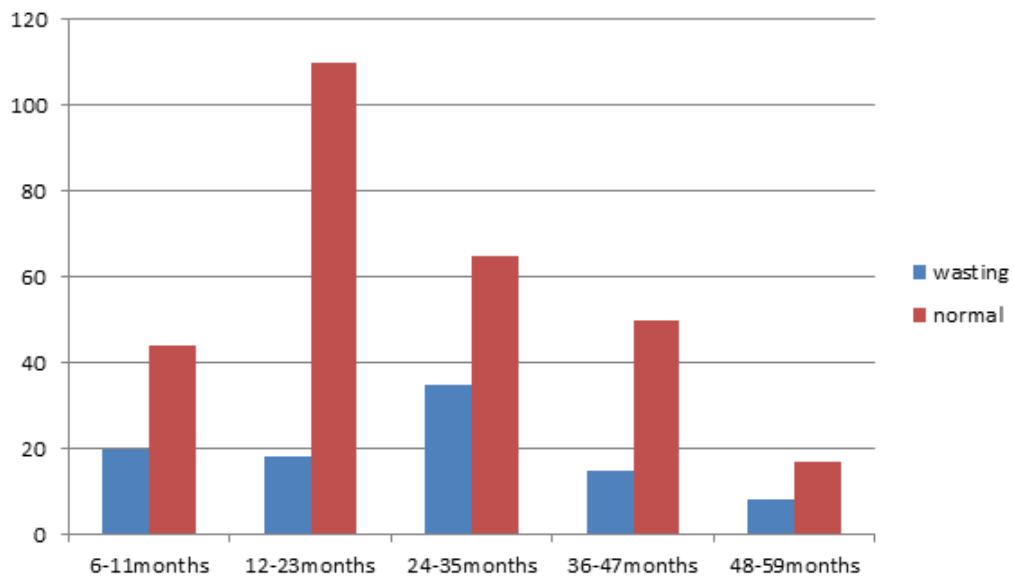


Figure 5. Magnitude of wasting by age among children aged 6-59 months

Table 6. Associated factors of stunting

Variable	Stunting		COR 95% CI	AOR95% CI
	Yes	No		
Educational status of mother				
Grade1-8	52	92	1.42 (0.7,2.74)	0.38 (0.18-0.66)
Grade9-12	34	28	3 (1.2,4.5)	0.3 (0.14,0.6) *
Diploma and degree	6	7	2.15 (1.32,3.76)	0.5 (0.24,0.51)
Non formal education	37	93	1	1
Child age in months				
6-11	35	27	1.4 (1,1.6)	2.2 (1.6,6.1)
12-23	37	91	0.44 (0.3,0.43)	2.3 (1.18,4.5)
24-35	38	62	0.66 (0.28,0.85)	2.2 (1.17,4.3)
36-47	23	42	0.6 (0.2,0.98)	1.8 (1.3,3.4)
48-59	12	13	1	1

Table 7. Associated factors of underweight

Variable	Underweight		COR (95%CI)	AOR (95%CI)
	Yes	No		
Child age				
6-11	27	35	0.24 (0.15-1.5)	0.7 (0.4,1.4)
12-23	56	72	0.25 (0.14-1.4)	0.9 (0.43,2.3)
24-35	48	52	0.29 (0.2-1.1)	0.45 (0.23,1.6)
36-47	37	28	0.41 (0.12,0.75)	0.2 (0.07,0.6)*
48-59	19	6	1	1
Type of complementary food				
Cow milk	80	77	1.45 (0.85,3.8)	3 (1,6)
butter	3	6	0.7 (0.5,4.4)	0.6 (0.1,1.5)
Sugar solution	6	8	1.05 (0.5,1.65)	1 (2.3,3.43)
Formula milk	30	30	1.4 (0.84,1.2)	0.64 (1.23,2.8)
Bula soup	54	30	2.5 (1.25,3.6)	2.8 (1.3,5)*
Breast feeding	40	56	1	1

*p<0.05 is significance

Discussion

In this study the magnitude of stunting, underweight and wasting were about 38.3%, 49.2% and 25.2%, respectively. This finding is lower than compared to the study were conducted different parts of the county parts especially stunting, but lower than wasting [19-21]. However, the finding of this study also slightly lower than the study was conducted in the Gimbi district, 32.4% stunting, 23.5% underweight and 15.9% wasting [22]. But, the finding of this study is revealed that magnitude of stunting and wasting was higher as compared with study of west Gojam zone [23]. Similarly, the finding of this study is revealed Magnitude of malnutrition also higher than study conducted on Beta-Israel children in Amhara region, 37.2%, 14.6% and 4.9% of children age 0-59 month were stunted, underweight and wasted, respectively [24]. This finding also slightly higher than national prevalence of malnutrition [16]. Magnitude of underweight higher but magnitude of stunting was low as compared to study done in Bangladesh, 40%and 42% of children were underweight and stunting , respectively [25]. The magnitude of malnutrition higher in this finding as compared to study conducted in Mongolia, the magnitude of stunting, wasting and underweight were 15.6%, 1.7% and 4.7%, respectively. The present finding showed that, children aged 36-47 times less likely underweight as compared to other age group children[AOR=0.2 (0.07,0.6); 95% CI]. Children who eat soup as a complementary food were 2.8 times more likely underweight as compared breast feeding [AOR=2.8 (1.3,5); 95% CI]. Children whose mother were completed grade 9-12 were 0.3 times less likely to be stunted than children whose mother had non-formal education [AOR=0.3 (0.14,0.6)95%CI]. In the other studies 6.35 months age of children were associated with stunting, but not underweight [2].

Conclusion and Recommendation

The magnitude of stunting, underweight and wasting were about 38.3%, 49.2% and 25.2%, respectively. This study was revealed that, magnitude of malnutrition was high than the regional and national figures found from Ethiopian Demographic Health Survey 2011 national reports. Educational status of mother and age of child age were the only variable that was significantly associated with chronic malnutrition (stunting). However, child age and type of complementary food for the child were significantly associated with underweight. Community based nutrition education program need to be established to tackle the problem of malnutrition at community level. Nutrition education by health extension works need to be strengthening to improving the feeding practice of parents on appropriate children feeding.

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