Assessment on Under Five Age Children Nutritional Status In Somali Regional State Shabelle Zone Godey Town

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Abstract
This study was done in Godey district Shabele Zone of Somali Regional state with objective of assessing nutritional status of children under five of age. Under this study the different factors associated with nutritional status that have an impact on children nutritional status were also assessed. Structured questionnaire was used in the data collection for this research. Data was collected for 1 month with two round where JJU Godey weekend center food science and nutrition students were participated as data collectors. The collected data were analyzed using SPSS 23 version software. The main result obtained the research were stunting (HAZ) is under normal condition which is 18.4%, underweight (WAZ) is medium which is 18.7% whereas wasting (WHZ) is under critical condition which is 20.6% according to WHO, 2006 standard. The data shows, improvement from previous year when compared to DHS 2016 data to Somali region. Factors such age of children, educational level of the household head, feeding practice, ANC attendance and year difference between the last two children have significant impact on the nutritional status of the children. Although there is some kind of improvement in the study area, still there is problem of food security and malnutrition which need solution. Based on this, using all opportunity in general and specific to the study area, community, government, non-government organization and other stakeholders should put their efforts in solving food security and malnutrition problem in the study area. And also further research should be done to get more up-to-date information.
Key words: *Nutrition, stunting, wasting, underweight, food security, nutritional status*

I. Introduction

1.1 Background and Justification

Globally, progress is being made in reducing the prevalence of undernourished people (both in general and among children); however the numbers continues to be intolerably high (1;2). In Sub-Saharan Africa the prevalence of underweight (low weight for age) and stunted (low height for age) children has declined only modestly since the 1990s, and due to population growth, the numbers of stunted children have increased in the same period (Unicef, 2009). Nearly all the Sub-Saharan African countries, are far from achieving the Millennium Development Goal (MDG) of halving the prevalence of underweight children under-five years of age from 1990 to 2015 (3;4).

Nutritional status of children is an indicator of the level of development and future potential of the community. A well-nourished population has a capacity to be productive and to improve its standard of living through hard work. Furthermore, in children malnutrition adversely affects their cognitive and learning performance. Adults, who as children suffered malnutrition, suffer functional impairments including reduced intellectual performance and working capacity (Ola et al., 2011). Inadequate nutrition is one of a wide range of interlinked factors that form poverty syndrome – low income, large family size, poor education and limited access to food, water, sanitation and maternal and child health services (UNICEF, 2012). To address malnutrition, the type of malnutrition and nutrition related risk factors need to be identified and evidence based intervention and policies implemented.

Research estimates that the risks related to stunting, severe wasting and intrauterine growth retardation caused 2.2 million deaths and 21% of disability-adjusted life years worldwide for children under 5 years and in Kenya for instant, infant and under-five mortality rates are 77 and 115 per 1000 live births respectively (MMS /MPHS, 2009). The national figure for acute malnutrition of children under five years old is estimated at 6%, however there are huge variations in different regions of the country. In the Arid and Semi-Arid Areas (ASAL) where food insecurity and natural disasters have often afflicted the population, rates of acute malnutrition are between 15 and 20% of children under five years and sometimes substantially higher (MMS /MPHS, 2009).

It is also well recognized that poor nutritional status in developing countries is mainly caused by fetal growth retardation which often result from low maternal food intake, hard physical work, limited nutritional knowledge, and infection during pregnancy (Timotewos, *et,al.*, 1999). High malnutrition rates in Ethiopia pose a significant obstacle to achieving better child health outcomes. Ethiopia has among the highest underweight and stunting rates among young children in SSA. Almost one out two children are moderately to severely underweight, and 16 percent are severely underweight. Chronic malnutrition in Ethiopia is worst than in other SSA countries: about one in two children were moderately to severely stunted, and slightly more than one in four children (26 percent) were severely stunted.

On the other hand, severe to moderate wasting at 11 percent was relatively lower compared to other SSA. Regional and urban/rural differences in child malnutrition are prominent in Ethiopia. Prevalence of underweight is more than three times higher in Tigray, Afar, Amhara and SNNPR than in Addis Ababa. Stunting is almost twice as high in SNNPR and Amhara compared to Addis Ababa. Urban /rural differences exist, which are as marked as regional differences. Severe to moderate underweight is 15 percentage points higher in rural areas than in urban areas, and moderate to severe stunting is ten percentage points higher in rural areas compared to urban areas. The rate of malnutrition is the highest among the 12-23 month olds for all the three forms stunting is a far more wide spread nutritional problem than wasting in Ethiopia (Timotewos G, *et,al.*, 1999, Zewditu G,2001, and WB, 2006).Malnutrition slows economic growth and perpetuates poverty through three routes—direct losses in productivity from poor physical status; indirect losses from poor cognitive function and deficits in schooling; and losses owing to increased health care costs (Ethioia a country status report on health and poverty, ND).

The supply of food is not a major determinant of malnutrition in the developing world. Rather, it is a lack of purchasing power of some households that prevents them from securing adequate diets (Timotewos G.et.al. 1999).

It has been argued that throughout the developing world there is a preferential allocation of food to adult men at the expense of adult women and children. This has been observed in various countries in the developing world, but it is not a universal phenomenon. Many different food distribution patterns have been observed, including biases favoring all adults (world bank, 2006).

Over 800 million people in developing countries do not have, at all times, Physical and economic access to sufficient, safe, and nutritious foods to meet their daily dietary needs and food preferences for an active and healthy life. Nearly one-third of children in the developing world remain underweight or stunted, the picture was now changed in Sub-Saharan Africa malnutrition is on the rise in Asia malnutrition is decreasing, but South Asia still has both the highest rates and the largest numbers of malnourished children.

Ethiopia is one of the least developed countries in the world and is the second most severely affected by malnutrition worldwide. The prevalence of malnutrition in Ethiopia continues to increase, affecting primarily women & children. Earlier studies have estimated Ethiopia's food insecure people to be around 40-50% of the total population. Although on-going humanitarian interventions and the good prospects for the main season continue to have a positive impact on the food security of the population, 10.4 million people require humanitarian assistance through the Productive Safety Net Program (7.3 million people) and the emergency program (3.1 million people). This level of food insecurity is expected to persist, especially in pastoral areas (Ramakrishna G, et.al, ND).

The chronically food insecure areas of eastern Ethiopia and the southern pastoral zones of Oromiya and Somali Regions continue to be the most food insecure areas (Ramakrishna G, et.al, ND). No study was conducted so far regarding this title here in the study area. Therefore, the aim of this study is to assess the nutritional status of under-five age children in Godey town of Shabele Zone Somali Regional State.

II. Materials And Methods

2.1 Study area

The study was conducted in Gode town Somali Regional State. Currently Somali Region is structured into 11 Zones of which Shebelle Zone is one of it. Gode town is the capital of Shebelle Zone and it is one the six self-administrated city council. Gode is almost 600KM away from the capital of Somali Regional State Jigjiga and it is the town established along with Shebelle River. It has about 10 Kebeles with one general

hospital and two health center. The weather is condition is desert and it is the town where Somali ethnic is dominant and some others Ethiopian such as Amhara, Oromo, Gurage, etc live together.

Gode is selected for this particular title because most of the study conducted by JJU is around Fafen Zone and there is little study done around Gode. Specifically with respect to this topic, there is no research done so far. Therefore, it is better to fill this and other gap.

2.2 Study population
The study populations was all households with at least one under five year's old child in Godey town.

2.3. Study Design
The study was cross-sectional both descriptive and analytical in nature, designed to assess the nutrition status of children under five years and its association with demographic and socio-economic characteristics, household food security, water availability, hygiene and sanitation, child feeding practices status of children under five years old.

2.4. Inclusion criteria
1. Households with at least a child of age 6 to 59 months.
2. Households with a minimum of 6 months residence

2.5. Exclusion criteria
1. Mothers/care takers with mental illnesses, communication problems or other severe conditions interfering the interview
2. Households where there is/are no child of age 6 to 59 months of age or children with severe deformities

2.6. Sample size determination
Sample size was calculated using Fisher's et al. (1991). The sample size for the study was estimated by using the formula of sample size determination using single population proportion by using the assumption that the proportion of wasting, stunting and underweight children for Somali region are 22.7%, 27.4%, 28.7% respectively for under five children (DHS, 2016). We selected the prevalence that give as the largest sample size at 95% confidence level and 5% margin of error and 10% none response rate,

$$n = \frac{(Z_{1-\frac{\alpha}{2}})^2 * p * (1-P)}{d^2}$$ Fisher's et al. (1991).

Where:
n= Total sample size that will be included in this study
d= marginal error = 0.05
P= prevalence rate = 0.5
$Z_{1-\alpha/2}$= confidence interval (95%) = 1.96
P value of 0.5 was used since there is no information reported before in such study in the area. Therefore, the final samples included in this study was calculated as follows:

$$\left[n = \frac{1.96^2 * 0.287 * (1-0.287)}{0.05^2} \right] = 315$$

315 + 10% non-response rate = 346

2.7. Sampling method
Lottery method was used to select 3 of the 10 kebeles of the Godey town. The sample size were allocated proportionally to each of selected kebele using Probability Proportional to Size method. Data collectors were go to the centers of zones of the three kebeles and spin a pencil and followed the direction to collect data from every other household till the required sample size obtained. Where there is more than one child in a household, one child will be selected by lottery method for the anthropometric measurements.

2.8. Data collection and instrument

Data will be collected from mothers/care takers in the selected households and one child aged 6-59 months from each household was considered for anthropometric measurement. Pre-tested and structured questionnaire will be used.

Ten data collector were recruited as research assistants from Jigjiga University Gode weekend center students. To minimize inter-observer variation of data collectors and increase their performance in field activities, three days training was given on the aim of the research, content of the questionnaire, and how to conduct questionnaire interview. Collected data was checked every day by supervisors and principal investigator for its quality and coding. Data collection will be completed in one month.

Anthropometric measurements (weight, height, and mid upper arm circumference) were done for all children included into the study. Weight was measured in kilogram to the nearest 0.1 Kg. Salter hanging scale for Children 6 to 23 months and beam scale for children over 24 months of age was used for measuring weight. Instruments were checked against a standard weight for its accuracy daily. Calibration of the indicator against zero reading was checked following weighting every child. Length will be taken with length board for those children less than two years of age, while height was taken for children two and above years in centimeter. Length and height were measured to the nearest 0.1 cm. Left mid-upper arm circumference was measured.

The nutritional indicators, weight-for-height, weight-for-age, height-for-age and mid upper arm circumference-for-age was compared with reference data from the WHO. Children below -2 Z score of the weight-for-age, height-for-age and weight-for-height will be considered under-weight, stunted or wasted, respectively. Values of the indicators below -2 Z score were considered to represent moderate under nutrition, while values below > or equal to -3 Z score were taken to indicate severe malnutrition.

2.9. Study Variables
2.9.1 Independent Variables:
- Socio-demographic variables such as age, occupation, marital status, religion, ethnicity, educational level, income, household size, etc.
- Personal hygiene of the care taker, sanitary practices, housing conditions, etc
- Health services utilization as measured by ANC, family planning, etc.
- Child feeding practices

2.9.2 Dependent Variables:
WHZ, WAZ, HAZ, MUAC and Food security

2.10. Data processing and analysis:

The data was entered and analysis using SPSS version 22.0, Emergency Nutrition Assessment for Standardized Monitoring (ENA for SMART) software. Data cleaning was done by running and tabulating all variable frequencies in SPSS.

Frequencies and cross tabulation were used to give frequencies, means, standard deviation in descriptive analysis on demographic and socio-economic characteristics of households. Proportion of male and female headed household, Age and sex distribution, education level and occupation of the study population, household size, source of income and expenditure were established. These demographic and socio-economic characteristics were correlated with nutritional status to establish if there was a relationship. Data from water, hygiene and sanitation, were cross tabulated to find their association with nutritional status.

Emergency Nutrition Assessment for Standardized Monitoring and Assessment of Relief and Transition (ENA for SMART) was used to convert raw anthropometric data (weight, height and Age of the children) into anthropometric Z-score that was used to classify children into levels of nutritional status (stunting, wasting and underweight). The classification of the nutritional status was done according to the WHO cut-off points recommended by the World Health Organization. The z-score data was then transferred to SPSS version 20 to be analyzed with other variable.

Binary logistic regression was used for analysis. Bivariate analyses were done to explore potential predictors of under nutrition.

IV. Results and Discussions

4.1. Result

Table 4.1: Socio-Demographic data of HHs

variable		Frequency	Percent (%)
Age of mother	15-25	90	28.6
	26-35	192	60.9
	36-45	32	10.2
	>45	1	0.3
Number of children in HH	1-5	222	70.5
	6-9	92	29.2
	>10	1	0.3
No of children less than 5 age	Up to 1	12	3.8
	Up to 2	137	43.5
	Up to 3	98	31.1
	Up to 4	68	21.6
Age of mother when got married	15-18	206	65.4
	19-21	85	27.0
	>22	24	7.6
Religion	Muslim	315	100.00
	Christian	0	0
	Others	0	0
Ethnicity	Somali	315	100.00
	Others	0	0
Head of the house hold	Husband	315	100.00
	Wife	0	0
Marital status of the mother	Married in union	209	66.3
	Married not in union	26	8.3
	Divorced	34	10.8
	Widowed	46	14.6
Number of people live in house currently	4-7	210	66.6
	8-10	92	29.2
	>11	13	4.2
Education level of the HH	Illiterate	204	64.8
	Able to read and write	11	35.2
Education level of the husband	Illiterate	109	34.6
	Able to read and write	170	54.0
	If grade specify	36	11.4
Family main Occupation	Farmer	75	23.8
	Merchant	37	11.7
	Daily labor	89	28.3
	Other (Specify)	114	36.2

4.1.1. Socio-demographic characteristics of the household

Table 4.1. Indicate the socio-demographic data of the HHs. According to the table, 60.9% of the mothers in the age range of 26-35 while only 0.3% are above 45 age. 70.5 % of the respondents HH have in between 1 to 5 children per family and from this 43.5 of the respondent have up two children under age of five. According the respondent all of the respondents are have same religion (100% Muslim), same ethnic (100% Somali) and in all head of the HH is husband. Majority of respond married in union 66.3% while 10.8% are divorced. 66.6% of the respondents said that from 4-7 people are live in HH as family members. Majority of the respondents are illiterate while 54% of the husband can able to write and read. When it comes to family occupation, 36.2% HH engaged in others business such as broker, while 28.3%, 23.8% & 11.7 are daily labor, farming and merchant respectively.

4.1.2: Data related to child demography

As shown in table 4.2. 33.3% of the children in the age range of 24-36 months while age range between 48-59, 36-48 & 12-24 months are 32.1%, 19% and 15.6 % respectively. 53.7% of the children are female while 46.3% of the children are male. As shown also in table 4.2., the year difference between two the consecutive children is 57.1% which is less than 24 months while 42.9% is within 24-48% months.

Table 4.2. Data related to children

variable		Frequency	Percent
Age of child in month	12-24	49	15.6
	24-36	105	33.3
	36-48	60	19.0
	48-59	101	32.1
Sex of child	Male	146	46.3
	Female	169	53.7
Year d/c b/n two of your children	Less than 24 month	180	57.1

	Within 24-48 month	135	42.9

Table 4.3: ANC and delivery condition

variable		Frequency	Percent
Attending ANC during your pregnancy	Yes	253	80.3
	No	62	19.7
Where did you give birth	Home	42	13.3
	Health facility	273	86.7
Who attend your delivery	TBA	62	19.7
	Health personal	253	80.3

4.1.3: ANC and delivery condition of the children

According to the table 4.3, 80.3% attend ANC during their pregnancy time while 19.7% were not attended ANC during their pregnancy time. Health facility is where 86.7% of the respondent gave their birth and 80.3% of the respondent attended their delivery through health professionals.

Table 4.4: Breastfeeding condition

variable		Frequency	Percent
Have you breasted the child	Yes	258	81.9
	No	57	18.1
When did you 1st put the child on breast feeding N 258	Within the 1st hour of the delivery	109	34.6
	Within the 1st 8 hour of the delivery	39	12.4
	After 2-3 days	19	6.0
	7 days later	90	28.6
Foe how many months did you breast feed N 258	< 6 months	142	55.0
	6-12 months	95	36.8
	>12 months	21	8.2
Why not breastfed N 57	Due to illness	30	52.6
	Other reasons	27	47.4
Age to start to give food in addition to breast feed	Immediately after birth	86	27.3
	Within 1-6 month	144	45.7
	Within 6-12 month	58	18.4
	12 month later	27	8.6
Have you given anything to child immediately after birth	Yes	270	85.7
	No	45	14.3
1st food you used to feed the child N:270	Milk	290	92.1
	Adult food	25	7.9
Have you ever fed the child on bottle feeding	Yes	300	95.2
	No	15	4.8

4.1.4: Breast feeding condition of children

81.9% of the respondents breastfed their child while 19.1 % were nor breastfed their children as shown table 4.4. Out of those who breastfed their children, 34.6% give breast feed within 1hr while some others give breast feed within 8hr, after 2-3 days and 7 days later are 12.4%, 6% and 28.6% respectively. From those mothers who breast feed their child, 55% gave breast feed their children for less than 6 months while those who gave breast feed to their children for 6-12months and more than 12months are 36.8% and 8.2% respectively.

From those who didn't give breast milk for their child, 52.6% says they didn't give breast to their children because of illness while 47.4% have some other reasons such as safeguarding their physical shape. 45.7% of the respondent give food in addition to breast feeding within 1-6 months of age while 27.3% start food immediately afterbirth and 18.4% start food after six month of age. On the other hand, 85.7% of respondent gave some kind of food just after birth of which 92.1% gave milk as 1st food to their children. Finally, 95.2% of respondent fed their child on bottle feeding while 4.8% use some other option to feed their child.

Table 4.5: Vaccines received by children

variable		Frequency	Percent
Did the child ever receive the vaccine	Yes	281	89.2
	No	34	10.8
Why did not the child receive the vaccine N=34	Shortage of time	12	35.3
	Lack of knowledge	18	52.9
	Other reasons	4	11.7
Did the child receive supplements	Yes	294	93.3
	No	21	6.7

4.1.5: Vaccines provided to the children

As shown in table 4.5, 89.2% of the respondents children received different types of vaccine at different level while the rest were received any kind of vaccine in one way others. From those who didn't received any kind of vaccine lack of knowledge (52.9%) is the main reason for not receiving vaccine. Shortage of time and other factors are others reasons   for not receiving vaccine for their children. Almost all (93.3%) children received or access to supplement according the data shown on table 4.5.

Table 4.6: Child health condition

variable		Frequency	Percent
Was the child sick in the last two weeks	Yes	242	76.8
	No	73	23.2
What is his/her illness N=242	Fever	111	45.8
	Cough	99	41.0
	Other reasons	32	13.2
What did you do for the illness N=242	Home treatment	38	15.7
	Visited health facility	204	84.3
Does the child have vision problem at night time	Yes	22	7.0
	No	293	93.0
Foamy type of scar at the lateral side of his or her eye	Yes	29	9.2
	No	286	90.8

4.1.6. Health status the children

Table 4.6 show that 76.8% of the respondent said their child was sick in the last two weeks while 23.2% has faced sickness during last two weeks. From those who faced illness; fever, cough and some other type's illness were the type's illness their child faced in the last two weeks with 45.8%, 41% and 13.2% respectively. Again those who's their child faced sickness majority (84.3%) visited health facility as treatment mechanism while other used home treatment in response to their child sickness. Almost all children have no problem of night time vision and foamy type of scar at lateral side his or her eye which are 93% and 90.8% respectively.

Table 4.7: WASH facility of the HHs

variable		Frequency	Percent
Where do you use for defecation	Defecate presence home latrine	248	78.7
	Latrine	46	14.6
	Other reasons	21	6.7
Where do you dispose child's extreta	Open field	48	15.2
	Others (Specify)	267	84.8
Hand washing during child feeding	Yes	300	95.2
	No	15	4.8
Where do you dispose HH waste	Open field	36	11.4
	Dumping	133	42.2
	Burning	146	46.3

4.1.7: Facility related to WASH of the HHs

68.2% of the HHs use river water as source of Water for the HHS while protected well less likely I the area as shown in table 4.7 and figure 4.1. Most of the HHs which is 78.7% of the respondent use home latrine for defecation and list number of respondent use other option which is most likely open defecation. When it comes to disposal of child's excreta, 84.8% of response use others option such disposing into homemade latrine while 15.2% of respondent use open field which worst for their health. Almost all or 95.2% of respondents wash their hand during child feeding process while 4.8% of respondents are reluctant. Regarding disposal condition HHs waste in the study area; they use mechanisms such as burning, dumping and open field which are 46.3%, 42.2% and 11.4% respectively.
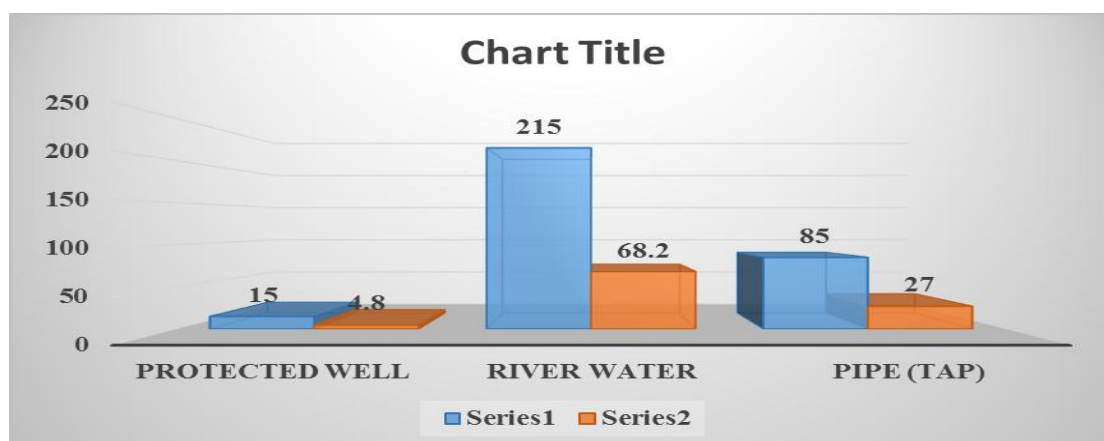
Chart Title

Figure 4.1: Source of water for the HHs

Table 4.8: HH housing condition

variable		Frequency	Percent
House type	Tached/tukul	107	34.0
	Corrugated iron sheet	102	32.4
	Mobile house	106	33.6
No of rooms	Two rooms	168	53.3
	Three rooms	139	44.1
	Four rooms	8	2.5
Does the house have good ventilation	Yes	137	46.0
	No	170	54.0
Does the family have radio or TV	Yes	219	69.5
	No	96	30.5

4.1.8: House setup of the HHs

As shown in table 4.8, the different types of house type are used in the study area in equal way. Tached, corrugated iron sheet and mobile house are the three types of house in the study area with 34%, 32.4% and 33.6% respectively. From these, more than half the respondent have two rooms in their house with 53.3% while 44.1% of respondent said they have three rooms and very few of respondent have four rooms which is 2.5%. More than half of the respondent said they don't have good ventilation which is 54% except some kind of indigenous means dealing with such hot condition. 69.5% of the respondent have either TV or Radio or both while 30.5% of doesn't have TV and/or radio.

Table 4.9: Economic Factors

Variables		Frequency	Percent
Does the HH have farmland?	Yes	257	81.6
	No	58	18.4
What does grows with your farmland N=258	Mixed Crop	179	69.4
	others	79	30.6
Does the HH produce cash crop N=258	Yes	258	81.9
	No	57	18.1
Type of cash crop N=258	Coffee	0	0
	Fruit and Vegetable	122	86
	Others	36	14

4.1.9: Economic status of the HHs

Majority of the HHs (81.6%) have farmland as means of their livelihood and only 18.4% of the respondent doesn't have farmland. From those who have farmland, most of them have 2, 3 and 5 hectare of farm land while few of them have 1 and 4 hectare of land. Again from those who have farmland, 69.4% of respondents grows mixed crop while 30.6% used single cropping system. From those crop grows in the study area, most HHs produce cash crop which is 81.9% while 18.1% produce other types of crop. From those cash crop produced in the study area, 86% is fruit and vegetable while their no coffee production as cash crop in the study area as shown in table 4.9.
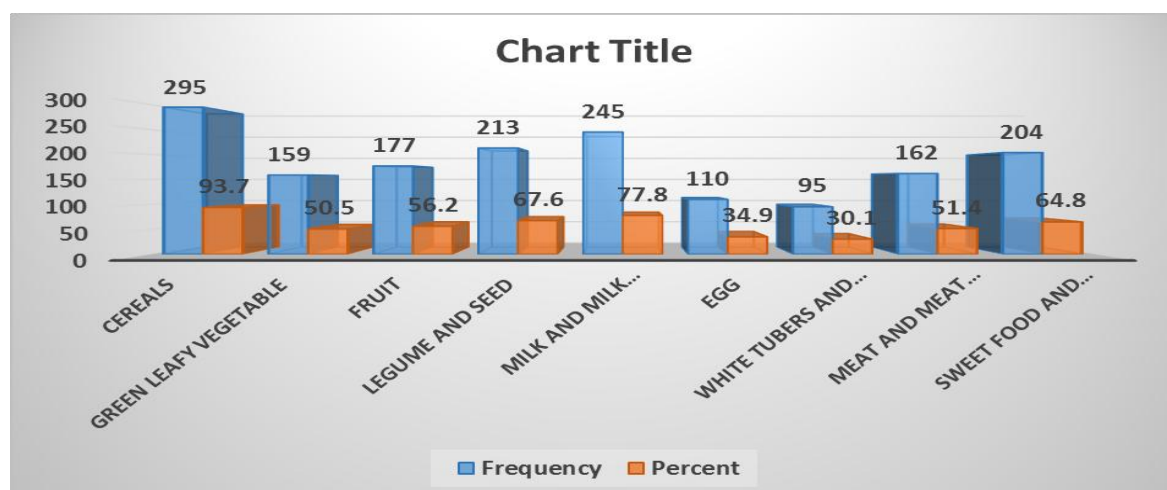
Fig 4.2: Dietary diversity

4.1.10: Dietary diversity

As shown in figure 4.2, majority of the households (93.7%) use cereals as there staple food as compared with other types of food product. Milk and milk products, legume and seeds, sweet foods are the other types food product used by the households in the study area in large quantity or frequently. Fruit and vegetable are partly used as food in there meal in the study area. While egg and white tubers (spices) are used in least quantity in the study area which is 34.9% and 30.1% respectively.

4.1.11: Nutritional status of the children

Table 4.10: Prevalence of underweight based on weight-for-age z-scores by sex (Underweight)

	All n = 315	Boys n = 146	Girls n = 169
Prevalence of underweight	(59) 18.7 % (13.4 - 25.6 95% C.I.)	(27) 18.5 % (13.4 - 25.0 95% C.I.)	(32) 18.9 % (12.9 - 26.9 95% C.I.)
Prevalence of moderate underweight	(28) 8.9 % (5.4 - 14.4 95% C.I.)	(11) 7.5 % (5.4 - 10.5 95% C.I.)	(17) 10.1 % (3.8 - 24.0 95% C.I.)
Prevalence of severe underweight	(31) 9.8 % (5.6 - 16.7 95% C.I.)	(16) 11.0 % (5.6 - 20.2 95% C.I.)	(15) 8.9 % (4.0 - 18.4 95% C.I.)

Table 4.10 describes the prevalence of underweight as measured by weight-for-age z-scores. Underweight is defined as <-2 z scores weight-for-age, severe underweight is defined as <-3z scores weight-for-age). There was no evidence of prevalence of underweight observed among 17 children below the age of 0-6 months. However, for children aged (6-59 months), the prevalence of underweight was 18.7% of whom 8.9% were moderately underweight while 9.8% were severely underweight. There were slight difference in underweight between boys and girls but a chi-square test on the difference in the prevalence of underweight between the difference gender found no significant difference (p>0.05). The mean WAZ was -0.81±2.00.

Table 4.11: Prevalence of stunting based on height-for-age z-scores and by sex (Stunting)

	All n = 315	Boys n = 146	Girls n = 169
Prevalence of stunting	(58) 18.4 % (14.4 - 23.3 95% C.I.)	(29) 19.9 % (13.6 - 28.1 95% C.I.)	(29) 17.2 % (13.1 - 22.1 95% C.I.)
Prevalence of moderate stunting	(24) 7.6 % (5.0 - 11.3 95% C.I.)	(14) 9.6 % (5.5 - 16.2 95% C.I.)	(10) 5.9 % (2.9 - 11.8 95% C.I.)
Prevalence of severe stunting	(34) 10.8 % (8.3 - 14.0 95% C.I.)	(15) 10.3 % (5.7 - 17.8 95% C.I.)	(19) 11.2 % (6.8 - 18.1 95% C.I.)

Table 4.11 describes the prevalence of stunting as measured by height-for-age z-scores. The prevalence of stunting among the children was 18.4%. About 7.6% of these were moderately malnourished while the rest (10.8%) were severely stunted. The prevalence of stunting was significantly higher in boys 45.1% than girls 35.5% (χ =4.720, df =1, p =.030). The means HAZ was -1.69±1.05.

Table 4.12: Prevalence of acute malnutrition based on weight-for-height z-scores (and/or oedema) and by sex Wasting

	All n = 315	Boys n = 145	Girls n = 169
Prevalence of global malnutrition	(65) 20.6% (15.4 - 25.0 95% C.I.)	(30) 9.5% (5.1 – 15.4 95% C.I.)	(35) 11.1% (6.6 - 15.4 95% C.I.)
Prevalence of moderate malnutrition	(38) 12.1 % (6.7 – 18.3 95% C.I.)	(18) 5.7 % (2.0 - 8.3 95% C.I.)	(20) 6.4 % (3.3 - 10.6 95% C.I.)
Prevalence of severe malnutrition	(27) 8.5 % (4.1 - 12.9 95% C.I.)	(12) 3.8 % (1.1 - 6.3 95% C.I.)	(15) 4.7% (2.2 - 7.1 95% C.I.)

Table 15 shows the prevalence of acute malnutrition by gender of the children. The prevalence of acute malnutrition was assessed using weight-for-height z-scores. Global acute malnutrition (GAM) is defined as <-2 z scores weight-for-height and/or oedema, severe acute malnutrition is defined as <-3z scores weight-for-height and/or oedema)

The prevalence of GAM was 20.6%. About 12.1% of the children were moderately malnourished while 8.5% severely malnourished. The prevalence of wasting was higher in boys 9.8% than in girls 5.3% but the difference was not significant (p >0.5). The mean GAM was -1.18±2.00.

Table 4.13: Prevalence of Global and Severe Malnutrition by Age

Age (mo)	Total no.	WAZ <-3 z-score %	WAZ >= -3 and <-2 z-score %	HAZ <-3 z-score %	HAZ >= -3 and <-2 z-score %	WHZ <-3 z-score %	WHZ >= -3 and <-2 z-score %
6-17	18	0.0	5.6	0	5.6	0.0	11.1
18-29	24	12.5	12.5	5	16.7	4.3	17.4
30-41	112	7.1	5.4	8	5.4	13.4	17.0
42-53	67	11.9	13.4	11	7.5	9.0	11.9
54-59	94	12.8	9.6	10	8.5	14.9	17.0
Total	315	9.8	8.9	34	7.6	11.5	15.6
1P-value		.038*		.022*		.043*	
2P-value		.587		.036*		.848	

WAZ- weight-for-age z-score, HAZ-height-for-age z-score, WHZ-weight-for-height z-score
1p-value is pearson chi square significant level between age groups
2p-value is pearson chi square significant level between girls and boys
* Indicate that the difference between malnutrition levels between age group and different sexes are significant at 0.05 levels of significance

When malnutrition levels were cross-tabulated with age cohorts, there were significant differences in prevalence of malnutrition between age groups as shown in the Table 4.13. No incidence of underweight and stunting was lowest in the first year of life and stunting is highest in second year of life while underweight and wasting was highest in the second year of life. Prevalence of underweight increased with age from the fourth year of life. No incidence of wasting was observed in the first year of life. Although the differences in prevalence of malnutrition were higher in boys than girls in all the indicators of malnutrition in this study, the difference was significant in HAZ (P< 0.05).

Table 4.14: Pearson correlation coefficients of selected variables and nutrition status

Variables	WAZ R	WAZ P	HAZ R	HAZ P	WHZ R	WHZ P
Education level of HHs heads/Husband	*-0.096*	*0.089*	*0.036*	*0.520*	*-0.167***	*0.003*
Family Occupation	0.031	0.588	0.047	0.406	-0.017	0.766
HHs Size	0.047	0.409	0.006	0.917	0.053	0.346
Marital status of the mother	-0.083	0.141	-0.080	0.158	-0.025	0.629
Age of the child in month	-0.320**	0.000	-0.262**	0.000	-0.172**	0.002
Sex of the child	-0.007	0.903	-0.046	0.416	0.060	0.289
Year d/ce b/n last two children	-0.168**	0.003	-0.100	0.075	0.124*	0.028
ANC Attendance during pregnancy	-0.115*	0.28	-0.180**	0.001	-0.061	0.283
Breastfeed practice	0.021	0.706	-0.023	0.689	0.049	0.383
First food used to feed the child	-0.093	0.099	-0.176**	0.002	0.084	0.136
Supplement given to children	0.052	0.362	-.0152**	0.007	-0.108	0.055
WASH (Defecation treatment)	0.053	0.034	-0.168**	0.003	-0.120*	0.033

** Correlation significant at 0.01 levels (2 tailed). *Correlation significant at 0.05 levels (2 tailed)

WAZ- weight-for-age z-score, HAZ-height-for-age z-score, WHZ-weight-for-height z-score

4.1.12. Factors Associated with Nutritional Status of Children

Bi-variate analysis was performed on various selected variables with nutritional indices of the children to determine possible associations (Table 4.14). A significant positive and linear relationship was found to exist between underweight, stunting and wasting among the children under five years after an inter-variable Pearson correlation analysis. Negative and significant correlation was observed between children's age and nutritional status based on wasting, stunting and underweight (r= -0.172, r= -0.262 and r=--0.320 respectively). Sex of children, marital status of the mother and breastfeeding were negative but not significant correlation with nutritional status of children in terms of underweight and stunting.

There was no significant relationship between the three indicators of nutritional status (HAZ, WAZ and WHZ) and Household size and family occupations. Household size was also negatively and significantly correlated with total land size owned and size of land farmed on by the household (p<0.05).

However, there was a significant association (p<0.05) between first food used to feed children & any supplement provided to children and stunting (HAZ r= -0.176 and r = -0.152 respectively) and between treatment of defecation (WASH) and stunting (HAZ) and wasting (WHZ). In addition, first food used to feed children has negative correlation with WAZ, and HAZ while supplement provided to children were negative correlation with HAZ and WHZ.

ANC attending was a significant association (p<0.05) with stunting and underweight to some extent (r= -0.180 and r = -0.115 respectively) but has negative correlation with all WAZ, HAZ and WHZ. Breast feed practice was negatively correlated with HAZ and while it has positive correlation with WAZ and WHZ.

4.2: Discussion
4.2.1 Demographic and Socio-economic Characteristics of Study Households

The size of the household (5.5) in Gode town is close to national and regional average for urban area of 5 (CSA, 2007). The sex ratio (male: female, 1:1.16) of the study population is similar to national trend where women are more than men. More than half of the mothers got married in the age between 15-18 and with average age of 18.1. The fact that 65.4 % of the mothers got married to the age below 18 years means that there are early marriage practice in the study area and as well dependent population outweighs the productive population. This youthful age structure is typical of populations with high fertility and high mortality rates (Masci, 2006). Early marriage and high number of dependent population places heavy burden on the independent population in provision of basic needs such as nutrition, education and special health care.

4.2.1.2 Household food situation

Majority of the households depend on mixed type of income generation such as daily labor, selling of cash crop (mostly fruit and vegetable) and other mixed type for which they below 1 dollar per day as in most developing countries. This implies that they do not have the power to access adequate food even when food is available in the market.

Majority of the households have less than 2ha of land as farming land for which they produce more of cash crop such as fruit and vegetable which is against the size each family that make it difficult to unsure food security. When it come food diversity, most of the household have used cereals as stable food and legumes & seed and milk & milk products come next while egg list used food product in study area as in also stated other research done in Kenya (Qabale, 2011)

4.2.2 Water availability, hygiene and sanitation status

Water supply, sanitation and hygiene have direct impact on diseases especially diarrhea and therefore are important for preventing malnutrition. When people are exposed to high levels of infection due to unsafe and insufficient water supply and inadequate sanitation, their nutrition status is compromised (WHO, 2001).

The finding of this study shows that about 73 % of the households in the study population rely on unsafe water supply from unprotected water sources such as river, underground water. The fact that water treatment is also not a common practice; the household members could be at high risk of water borne diseases. with the daily average amount of water for domestic use being 61.3 litres per household and considering the house hold sizes this study population, majority (62.5%) of the household access less domestic water than the recommended amount of 15 litres per person per day as stipulated in SPHERE standards (SPHERE, 2011). Either the time used to fetch water is rather long or the price to but water from seller is too high with sometimes availability problem in the study area. Moreover mothers spend most of their time away fetching water for household use rather than staying home taking care of their children (Qabale, 2011). This situation not only jeopardizes the hygiene standard and increasing the risk to infectious diseases among the children but also child

care practice. Poor water and sanitation situation has also been reported by other studies in Ethiopia (Aweke et al., 2012, Andrew et al., 2008)

4.2.3 Nutritional Status of Children

Analysis of nutrition status in this study is according to the new WHO, 2006 standard. Nutritional status of children under five years of age is an outcome of immediate, underlying and basic causes of malnutrition (UNICEF, 1998).

The finding of this study shows that generally, prevalence of underweight (18.7%), stunting (18.4%) and wasting (20.6%) is low as compared to national average reported by DHS for Somali region (DHS, 2016). Prevalence of stunting and underweight is lower but wasting is similar to average for Eastern province. There is no evidence of overweight in the area.

The prevalence of underweight (18.7%), stunting (18.4%) and wasting (20.6%) is lower than that reported by Ethiopian demographic health survey (DHS) for national average of 28.7%, 27.4% and 22.7% respectively. Although the data shows some kind of improvement but these figure still indicate problem of malnutrition qualify the area to be classified as chronic food insecure area according to the FAO /FNSAU integrated food security phase classification of 2006.

The prevalence of malnutrition as shown in finding that, stunting is low (18.4%), underweight is medium (18.7%) but wasting is in critical range (20.6%) against WHO standard which are <20%, 10-19% and >=15% respectively (WHO, 2010b).

The observation that the prevalence of stunting, underweight and wasting in the first year of life is low is similar to that from the finding of a survey conducted earlier in 2008 in Mbeere Sub County (KNBS, 2009b) and Makueni District (Macharia et al., 2005); whereby the prevalence of stunting was highest among children 12-35 months. This could be attributed to poor weaning and complementary feeding practices resulting into inadequate energy and protein intake. The poor feeding practices may be due to either lack of knowledge by the mother or lack of adequate food.

The finding that prevalence of underweight, stunting and wasting is slightly higher in male than female concurs with that of national prevalence indicated in Demographic Health survey (DHS, 2016).

4.2.4. Factors Associated with Nutritional Status

The negative and significant relationship observed between children's age and nutritional status based on stunting, wasting and underweight could be explained by the fact that as the child grows older he/she becomes more dependent and access different food than the younger infant who depends on what is provided by the caregiver/mother (Meme, 1996). However, in this study the prevalence of stunting and wasting seem to increase after the 48 months of age. This is probably due to increased physiological activities of the child at this age which may necessitate more nutrient intake to support growth and development. Children at this age are outside homes either in school or playing, failing to feed regularly to replenish their energy.

Lack of relationships between the nutritional status and gender of the household head as well as their education level could be attributed to the fact that the overwhelming majority of the household heads were of the same gender (male) and also similar education level to impact difference in nutritional status (Qabale, 2011).

The no negative significant relationships among household size and stunting and wasting could be explained by the fact that majority of the family members less family size or new bride where meal is distributed among such less numbers of household members resulting to adequate diet for an some but in the long run unless come with concrete solution it couse period eventually causing chronic malnutrition (Macharia et al., 2005 and Qabale, 2011) .

Similar to other studies (Onyango et al., 1998; Ruel, 2002), this study did find significant association between nutritional status and child feeding practice. Thus, malnutrition in this area might be caused by these and other factors. Additional studies are required to explain effect of diversified foods consumed by children in the study area. The high consumption of food items from mainly cereals observed in this study only confirms that the diets of the children were predominantly based on starchy staples. Besides lacking adequate nutrient, it is also possible that the quantity of carbohydrates obtained from these cereals group was still not adequate to meet the macronutrient needs of the children. From personal observations, the diet of children below two years mainly comprised of starchy staple (wheat, maize and out flour). While the intake of energy is important in diet, other nutrient such as vitamins, proteins and minerals are also necessary for healthy living. Moving from a monotonous diet to one containing a more diverse range of foods has been shown to increase intake of energy as well as micronutrients in developing countries (Gina et al, 2007).

Although milk & milk product, legumes, nuts & seeds and sweet food were the others most popular food groups after cereals, the benefit from consumption of these food groups was not evident in determining nutritional status in this study probably because other factors like quality of the diet, quantity of food consumed and utilizations by the body are also determinant factors.

V. Conclusion And Recommendation

5.1 Conclusion

From the study, the farm land owned by each households were very small and the alternative income option like daily labor is not enough to feed the family because of lack consistency and less labor payment. Head of the household is dominated by husband whether the income is only generated by wife. This is to indicate, women have no role in decision making processes of the households.

Regarding the nutritional condition in the study area, stunting in normal while underweight is medium while wasting is under critical level. This classify the area more to acute malnutrition one. But there more improvement as compared to demographic health survey data. With respect to factors associated with nutritional status; age of the children, Antenatal care attendance, feeding practice, education of level of the head of the household and year difference between the last two children have significant impact on the nutritional condition of children. On the other hand, family size, occupation and some other factors have least effect on the nutritional status of the children.

5.2 Recommendation

Based on the finding and identified gaps, the following are suggested as recommendation;

* Somali people livelihood mostly attached to animal based food such as milk and meat especially in pastoral community. Using this as opportunity, encouraging community usage of these food by adding with others to diversify the diet they used for their children.
* Again using Shabele river as unique advantage to study area, encouraging people to use irrigation to produce multi type of crop (cash crop) so that they can ensure food security and especially overcome seasonality food security problem.
* As most households purchase the food from market (not own produce), they should have to buy food from different mix of cereals, legumes, seed, others in terms of type and amount that complement with family.
* Introducing urban agriculture in the area so important as far as we deal with food insecurity and malnutrition such as poultry, small ruminant and other sectors.
* The problem of food insecurity could be tackled through multi-sectoral approaches that address different household dynamics including food security, health, nutrition and water/sanitation. Agricultural projects should therefore integrate health and nutrition components during planning to develop focused interventions aimed at improving nutrition, health and food security of the households. It is therefore recommended that the planned project/programme for Gode town should make provision for such integration and collaboration with the relevant sectors including health and water. Provision of nutritional education to the community members is also essential to address malnutrition.
* Further research should be done on the impact of infant & young feeding practice, immunization & morbidity, house hold food consumption & energy expenditure on nutritional status of the children should be done.

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