Indira Gandhi National Open University School of Graduate Studies

Malnutrition and Associated Factor among 6-59 Months Children in the Pastoralist Community of Dugde Dewa District, Borena Zone, Ethiopia

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Abstract

The study was conducted in the pastoralist communities of Dugde Dewa district within five randomly selected kebeles. The study population was children from the selected 5 kebeles in the study site. A total sample of 818 children were involved in the study.. General information on the family characteristic of the child was collected through house to house visit and Anthropometric measurements (weight and height) was done for all children included in the study. Nutritional status of children and associated factors were assessed. Stunting was found to be highest form of malnutrition in which 292(35.8%) of them were stunted from this 159(19.5%) of them were severely stunted. From the total participants of 816 children 75(9.2%) of them were wasted. Regarding Weight for Age which is an indicator of Underweight, 95(11.6%) of them were underweighted and 32(3.2%) of them were severely underweight. Income was the variable that was found to have statistically significant association with all types of nutritional problems. Breast feeding status was the predictor for both stunting and wasting. Education status of mother, breast feeding, febrile disease and income were the determinants of stunting. According to this study, stunting accounts the highest number among all nutritional problems. This could be due to long term food insecurity, insufficient dietary intake, infections and poor feeding practice. So, governmental and nongovernmental organizations should have to work hard to tackle this problem and to bring solution.

Declaration

I hereby declare that the dissertation entitled Malnutrition and Associated factors among 6-59 months children in the pastoralist community of Dugde Dewa district, Borena Zone Submitted by me for the partial fulfillment of the MSW to Indira Gandhi national open university ,(IGNOU) New Delhi is my own original work and has not been submitted earlier ,either to IGNOU or to any other institution for the fulfillment of the requirement for any other programme of study .I also declare that no chapter of this manuscript in whole or in part is lifted and incorporated in this report from any earlier work done by me or other

Place: Borena zone, Dugeda Dawa Signature----------

Date-: September, 2013 Enrolment No: ID 1051147

Name: Yeneneh Bizuayehu

Adress: Borena Zone ,Yabello Ethiopia

Certeficate

This is to certify that Mr. Yeneneh Bizuayehu Students of MSW from Indira Gandih National Open University, New Delhi was working under my supervision and guidance for his project work for the course MSW his project entitled Malnutrition and Associated factors among 6-59months children in the pastoralist community of Dugde Dewa district, Borena Zone which he is submitting, is his genuine and original work.

Place: Borena Zone, Dugeda Dawa Signature_____

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List of Abbreviations

ANC – Anti natal care

CSA – Central statistics agency

DHS – Demographic and health survey

DCH – Department of community health.

FAO – Food and agriculture organization of the UN

GDP – Gross domestic product

HEWs_ Health Extension Workers

IDD – Iodine deficiency disorder

IFPRI - International food policy research institute

HHS – House holds

HGB_ Humanitarian policy group

IMR – Infant mortality rate

LB - live birth

NCHS – National center for health statistics

NGOs – Nongovernmental organizations

ONRS – Oromia National Regional State

PEM – Protein energy malnutrition

SCF (UK) – Safe the children fund- UK

NCHS - National center for Health Statistics

WHO – World Health Organization

W/H - Weight for Height

Chapter- 1 Introduction

1.1 Back ground information

Ethiopia is a landlocked country located in the Horn of Africa. The country covers approximately 1,221,900 square kilometers and shares frontiers with Sudan, Kenya, Somalia, and Djibouti. Much of the Ethiopian landmass is part of the East African Rift Plateau. Ethiopia has a general elevation ranging from 1,500 to 3,000 meters above sea level. The capital city of the nation is Addis Ababa and located in the center of the country. The highlands that comprise much of the country are divided into northern and southern parts separated by the Great Rift Valley. In Feb, 2012 CSA the country had a population of about 86 million. The population has been predominantly rural though there has been a steady growth in the rate of urbanization in the country. The percentage of population that resided in urban areas was merely 6% in 1960. It increased to about 16% by 2006(1).

Ethiopia is a country endowed with many resources, a diversified topography, and many nationalities. A multi-ethnic society, it serves as the home of about 80 ethnic groups (2).

The study obtained on pastorals' in Ethiopia estimate that pastoral and agro-pastoral communities in Ethiopia constitute roughly 10-12% of the total population. According to these studies, these groups occupy some 60% the countries land mass, mainly the peripheral areas of the country. The main pastoral communities are the Somali (53%), Afar (29%) and Borena (10%) living in the Southeast, Northeastern and Southern parts of Ethiopia, respectively, and the balance (8%) are found in Southern, Gambella and Benshangul regions. The majority of these are pastoralists engaged in extensive livestock herding. Within and between each of these groups there are different adaptive specializations dependent on varying ecological, economic and cultural factors (3).

Ethiopia's pastoral groups manage some 40% of the national cattle herd, one quarter of the sheep, three quarters of the goats and nearly all the camels. About 90% of livestock export of the country comes from these areas. Livestock in these areas also supply almost all unofficial exports across the borderlands where animals are first trekked to the neighboring countries and re-exported to the Middle East (3). Livestock in the pastoral areas are the major source of food (milk and meat) and income, as well as a source of employment. They also serve similar purposes and functions for people living in urban and rural towns adjacent to the pastoral areas. Livestock contribute a significant amount to the national economy. In terms of gross national product, the contribution of livestock to the agriculture sector and the national economy is 40% and more than 20% respectively (4). The pastoral areas are characterized by frequent droughts with high animal mortality followed by famine and high death rates in the human population (3, 4).

In 2005-2006 drought affected an estimated 1.7 million pastoralists and agro-pastoralists in Southeastern Ethiopia. The worst affected areas in pastoral regions were Afder and Liben zones and parts of Gode zone in Somali Region and southeastern parts of Oromia Region(4). Emergency levels were reached in many woredas in these areas. During the study it became apparent that many felt that the scope of the crisis had been in some cases exaggerated, particularly in Somali Region where the government sought to make capital by spreading the response throughout the entire region. Findings from the fieldwork for this study suggest that the drought response in most pastoral areas was largely late and less effective than it might have been. The default emergency intervention was food relief, and livelihoods protection and emergency livelihoods interventions were limited (5).

The situation in Borena zone with regard to animal health, food security and water for human and animal consumption is deteriorating on a daily basis. The extended dry season follows insufficient rainfall during the rain (October-December) and conditions have been exacerbated by overstocking of livestock and encroachment of land by farms and bush trees. Coping mechanisms are stretched to breaking point and pastoralist communities, children, the elderly and people living with HIV/AIDS are particularly vulnerable to livelihood and health risks (6).

So, adequate nutrition is the means by which people thrive, maintain growth, resist and recover from diseases and perform their daily tasks. When nutrition is inadequate, vulnerable populations are likely to become malnourished. Malnutrition includes a wide range of clinical disorders in which an individual's physical functions are impaired. Common consequences of malnutrition include growth failure, decreased resistance to disease and reduced ability to work (7).

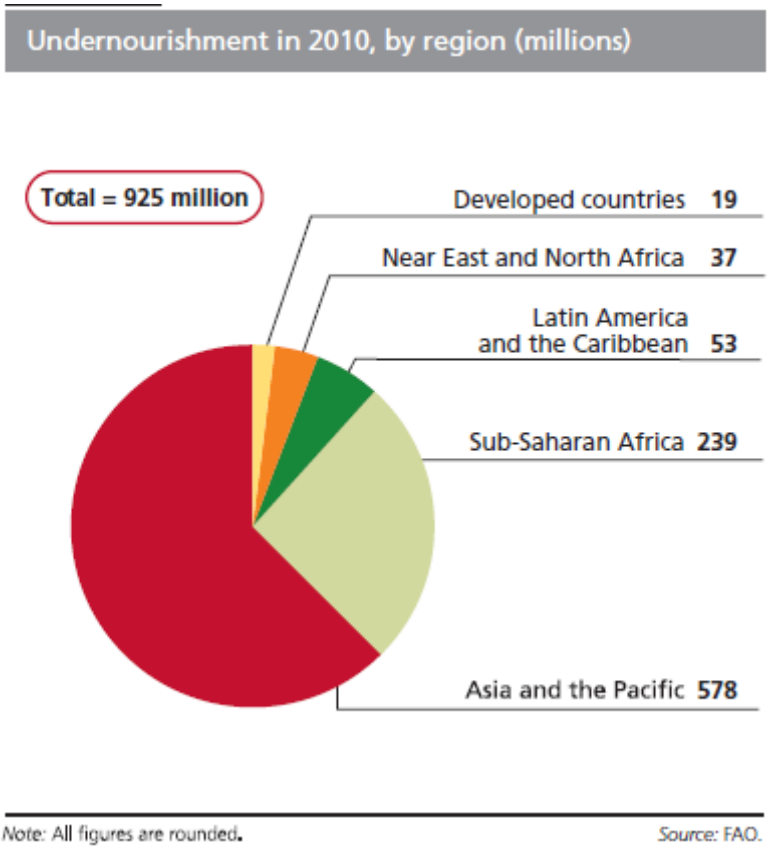
1.2 Statement of the Problem

Over 150 million children under five in the developing world are underweight a factor contributing to over half of all child deaths worldwide. Approximately 80 percent of the malnutrition- related deaths were due to mild or moderate forms of malnutrition. Malnourished children have lowered resistance to infection. Even a mildly underweight child has an increased risk of dying. WHO estimates that of the 10.4 million deaths of children fewer than 5 years of age that occurred in developing countries in 1995, about half were associated with malnutrition. Additionally, the proportion of underweight children dropped from 33 per cent in 1990 to 28 per cent in 2003, with significant advances in some very poor

countries. Still, progress is too slow to meet the MDG target or to restore normal lives to the millions of children who are currently undernourished (11, 12).

In sub-Saharan Africa, there has been little or no change over the period 1990-2003, and nearly a third of all children under five are underweight. Because of population growth, the number of malnourished children in sub-Saharan Africa has actually increased from 29 million to 37 million over the period 1990 to 2003(12).

Figure 1 Malnutrition by region, 2010



Malnutrition can best be described in Ethiopia as a long-term year round phenomenon due to chronic inadequacies in food intake combined with high levels of illness, the two immediate causes of malnutrition. It is not a problem found uniquely during drought years. It is a year round chronic problem found in the majority of households across all regions of the country (13).

In Ethiopia 47% of children under five are stunted and 24% are severely stunted. 11% of children under five are wasted and 2% are severely wasted. The weight for age indicator shows that 38% of children under five are underweight and 11% are severely underweight (14).

Since the number of research conducted in this area was not sufficient and pastoralist communities are marginalized social groups, this study tried to look at the major contributing factors for malnutrition in that community and the major type of malnutrition especially in relation to their living condition, food habits, dietary diversification, and food insecurity. Additionally to look at the existence of previously investigated problems and related factors. It also serves as a reference for further study in the country. In order to address the forerunning problems the following basic research questions were formulated to be answered in the course of the study.

- What are the major contributing factors for malnutrition in community understudy
- What prevalence of stunting of children 6 to 59 months of age in the study area
- What prevalence of wasting of children 6 to 59 months of age in the study area
- What are the knowledge and practice of mothers/caretakers on complementary and supplementary feeding of the child

1.3- General Objectives:

To determine nutritional status and associated factors among children 6-59 months of age in the Pastoralist community of Dugde Dewa district, Borena Zone.

1.4- Specific Objectives

1. What are the major contributing factors for malnutrition in community understudy

2. To determine prevalence of stunting of children 6 to 59 months of age in the study area
3. To estimate prevalence of wasting of children 6 to 59 months of age in the study area
4. To assess the knowledge and practice of mothers/caretakers on complementary and supplementary feeding of the child

1.5- Significance of the study

- The pastoral areas in Ethiopia are one of the most drought vulnerable areas with chronic food deficiencies.
- Pastoralists are the most marginalized social groups in the country in terms of access to public services including education and health services.
- The number of research conducted in this area was not sufficient to impact the pastoralists' marginalization.
- The study attempted to look at the major contributing factors for malnutrition in the community and the major type of malnutrition especially in relation to their living condition, food habits, dietary diversification, and food insecurity.
- It will also serve as a reference for further study and recommend some improvements in the future.

Chapter 2: Literature Review

2.1 General Background

Adequate food and nutrition are essential for proper growth and physical development to ensure optimal work capacity, normal reproductive performance, adequate immune mechanism, and resistance to infection. Inadequate diet may produce several forms of malnutrition in children, the most important being protein energy malnutrition (PEM), Nutritional anemia, Vitamin A deficiency and Iodine deficiency disorder. These and other nutritional disorders may also serve as predisposing factors for several chronic and crippling diets related non- communicable diseases and have lasting effects throughout the life span (17).

Deficiencies of key vitamins and minerals continue to be pervasive, and they overlap considerably with problems of general under nutrition (underweight and stunting). A recent global progress report states that 35 percent of people in the world lack adequate iodine, 40 percent of people in the developing world suffer from iron deficiency, and more than 40 percent of children are vitamin A deficient (18).

The three commonly used indicators of malnutrition are height-for age, weight-for-age, and weight-for height. Children whose measurements fall below two standards deviations from the reference median are generally considered malnourished. Each indicator captures different aspects of malnutrition (19).

2.2 Magnitude of Malnutrition

Stunting, or low height for age, is considered an indicator of chronic malnutrition. Height for age measures linear growth and therefore a low score is indicative of a cumulative growth

deficit. Stunting is often the result of inadequate feeding practices over a long period and/or repeated illness. It is likely to persist even after these conditions are eliminated. Wasting, or low weight-for-height, measures body mass in relation to body length and is generally considered to reflect acute malnutrition. As an indicator, wasting is likely to vary over short periods of time due to food availability and disease prevalence. Underweight, or low weight for age, is a composite of height for age and weight for height. It is generally considered a general indicator of malnutrition, since a child that is underweight could be stunted or wasted, or both stunted and wasted (19).

Understanding the problem of nutrition in a developing country like Ethiopia and arriving at a consensus on the synergies and the integration of various causes of malnutrition are deemed essential as a background for the development of a National Nutrition Strategy (NNS). Three clusters of causes of malnutrition are identified as key sets of determinants for the process of developing the NNS. These include the immediate causes, the underlying causes, and the basic or root causes.

2.3 Feeding Practice

These included feeding frequency, dietary diversity and milk consumption; vitamin A supplements in the previous 6 months; breast feeding. The symptom of fever is non-specific but will include malaria that is known to be prevalent in the area (16).

According to study conducted in Northern Kenya, available data suggest that breastfeeding for up to twenty months is common, but that exclusive breastfeeding is extremely rare (0.4 percent). The effects of early mixed feeding have been well documented and include greater risk of infection, particularly diarrhoeal disease and acute respiratory infections (ARI).

Inadequate introduction of complementary foods affects over 80 percent of infants in Turkana. Infant feeding practices was found to be strongly associated with acute malnutrition in children in Turkana. An increased practice of exclusive breastfeeding could immediately reduce infant deaths by 20 percent (19).

Similarly study conducted in Ghana shows (19), for the type of feeding received during the first 6 months after delivery, 51.8% were exclusively breastfed, 37.5% were mixed fed (received both breast milk and other foods) while the remaining10.7% were exclusively formula fed. Children who were exclusively breastfed for the first 6 months after birth had lower prevalence rates of stunting than those either mixed fed or formula fed for the same period. However, the prevalence of underweight was slightly lower among children mixed fed (5.2%) for the first 6 months compared to those exclusively breastfed (8.3%) and formula fed (9.4%) (20).

Breastfeeding is nearly universal in Ethiopia, with 96 percent of children being breastfed at some point. However, a very large proportion of women do not practice appropriate breast feeding (BF) and complementary feeding (CF) behavior for their children. About a third of babies do not receive. BF within one hour of birth and only one in three children age 4-5 months is exclusively breastfed. Much of inappropriate BF and CF behaviors are clearly due to lack of knowledge, rather than practical or financial constraints in practicing such behaviors (22).

2.4 Feeding Frequency and Diversity of Food

Feeding Frequency and Diversification is among the immediate cause for malnutrition. Based on the WHO and UNICEF guidelines, minimum dietary diversity for breastfed children aged

6-23 months include foods from at least four of the following categories: 1) grains, roots and tubers; 2) legumes and nuts; 3) dairy products; 4) fresh foods; 5) eggs, 6) vitamin-A rich vegetables and fruits; and 7) other fruits and vegetables. Minimum meal frequency is defined as solid, semi-solid or soft food twice per day for breastfed children aged 6-8 months and three times daily for breastfed children 9-23 months. The surveillance also assessed prevalence of minimum acceptable diet, which is a composite indicator of dietary diversity and meal frequency (22).

A study in Nepal shows for children aged 6-8 months, 90.9% received complementary food in accordance with minimum meal frequency requirements, and 82.5% of children aged 9-23 months received the appropriate number of meals per day. However, only 18.0% of children aged 6-23 months received the minimum in dietary diversity. These two indicators combined resulted in only 17.0% of children in this age group receiving the minimum acceptable diet. Of particular concern is the fact that only 49.0% of children aged 6-23 months in the sample received animal source foods, and an even smaller proportion (37.0%) received vitamin-A rich fruits and vegetables. Due to this 30.0% of children aged 0-59 months from the probability sample had suffered from diarrhea, 17.0% had an acute respiratory infection and 36.7% suffered from another illness. Accounting for the overlap of illnesses, 55.5% of children were recorded as suffering an illness (23). A study in Uganda shows the risk of healthy children being stunted or underweight was low relative to unhealthy children (24).

2.5 Birth Interval

Closely spaced pregnancies are often associated with the mother having little time to regain lost fat and nutrient stores. Higher birth spacing is also likely to improve child nutrition, since the mother gets enough time for proper childcare and feeding. Studies in developing countries

showed that children born after a short birth interval (less than 24 months) have higher levels of stunting in most countries where demographic health surveys have been conducted (25). similarly the study conducted in Ethiopia shows Preceding birth interval of the child was also negatively associated with stunting, and the highest proportion of stunted children were observed among those whose preceding birth interval was less than 24 months. Smaller percentages (47%) of children of low birth order are malnourished compared to those of higher birth orders (25).

A study in Bangladesh shows to identify the determinants of stunting using multivariate analysis was showed that; previous birth interval was highly significant and had an inverse relationship with prevalence of stunting. Children with previous birth interval 0–23 months and 24-47 months had respectively 1.55 and 1.36 times higher risk of being stunted as compared to children with birth interval 48 and above months (26).

2.6 House Hold Food Security

Insufficient household food security was assessed by mothers daily meal frequency and monthly diversity of foods consumed. Food Security generally defined as all people, at all times, have physical and economic access to sufficient safe and nutritious food for a healthy and active life (16).

A food crisis is defined as unusual and severe food insecurity that threatens peoples' lives/livelihoods. It will depend on the underlying vulnerability of the affected population, the intensity and nature of the external shock, the duration of the crisis, the coping capacity of the population, and the response of government and humanitarian agencies (16).

Pastoral communities are highly vulnerable to food insecurity. Vulnerability to food insecurity is aggravated by underlying causes, external shocks, and internal capacities to cope. Underlying vulnerability is very much associated with structural conditions, rendering some populations more vulnerable to acute food shortages, such as poverty, lack of basic services, etc. External shocks are associated with the actual emergency or stress factors, such as recurrent drought, floods, earthquake, conflict, displacement, etc. Internal capacities to cope refer to peoples' capacities to cope with the shock, and depend on factors such as social networks, assets, and political status. Based on the above scenario, pastoral communities are currently vulnerable to food insecurity even with the slightest external shock (8).

A study conducted in Mali shows that; socio-economic variables are strongly related to stunting. In other words, chronic malnutrition of children under-five is very important among children whose parents grow millet and sorghum as main crops i.e. zone of lakes (43%). The stunting rate is less in the zones where development potentials exist i.e. livestock zone (32%), village irrigated perimeter zone (35%), river zone (37%). The stunting rate decreases when one moves toward the city. Based on this result, the diversification of agricultural production systems, for example the cultivation of beans or sweet potato in the lakes for household food consumption might be one of the solutions to child under-five malnutrition in the study zone (27). Similarly the study undertaken in Egypt shows that, the high socioeconomic and environmental conditions were significantly associated with low prevalence of stunting (28).

The relationship between improved child nutrition and economic development are related. The evidence justifying the arrow going from "improved child nutrition" to "enhanced human capital" has been reviewed. There is considerable evidence for relationships depicted.

Economic growth, particularly those which lead to poverty reduction in urban as well as in rural areas, are one of the key factors driving change in nutrition at national levels *(29)*.

Early marriage and early first delivery are common, particularly in Maradi Region where acute malnutrition rates have been very high over time. This cultural tradition contributes to a high fertility rate and as well as to the associated problems of high maternal and child mortality and poor infant and young child feeding. Furthermore educational status and literacy rates are particularly low among women. School attendance is estimated at 27 percent for females and adult literacy for women is less that 15 percent (30).

Mother's education level is likely to be a significant factor influencing child feeding practices. The finding show the introduction of other liquids takes place earlier than at the suggested 6 months of age—with children as young as 2 months of age consuming other liquids. Almost thirty percent of children fewer than 6 months are also given plain water or other water based liquids or juices. Although there is no significant difference in the length of breastfeeding between mothers with any education and primary education, the children of mothers with a primary education are breastfed more frequently (31).

A study conducted in Gambia and Niger in relation to malnutrition and Education status of mothers shows, possession of at least primary education by the mothers significantly reduces the probability of the children becoming stunting. Also, possession of at least secondary education reduces stunting in the two countries. This observation goes in line with expectation because educated women are expected to be better than illiterate ones in all aspects of child care, food formulation and understanding of the needs of the child at every stage of growth and development (32).

Similarly a study conducted in Congo indicates that mean height-for-age increases when the level of schooling of the mother rises and when the economic level of the household goes up from low to medium or high. And the prevalence of thinness in mothers is less when the head of the household has a higher schooling level (33).

2.7 Vaccination

A study conducted at Somali region shows children who were vaccinated against measles had a reduced risk of stunting. The coverage of vaccination was not uniform, but tended to focus on the more accessible kebeles, so there is concern that vaccination was just a marker of better access to communications in general. In the multiple logistic regression models, however, this association was also apparent, suggesting that the vaccination itself was protective against stunting (16).

Climate variability intertwined with poor economic conditions can lead to population displacement. People may be forced to move to more fragile ecosystems. The consignment of poor populations in these marginal lands may cause environmental degradation. This ecological marginalization of poverty also increases the risk of malnutrition (34).

A study in 24 Food distribution sites in Arero and Borana provinces in southern Ethiopia in 1985-6 shows that the risk of death was increased during dry seasons except for the traditional pastoralist and agro pastoralist societies in 1985, when it was increased during the rainy season (35).

2.8 Water and Sanitation-Related Illnesses

Inadequate access to clean water and proper sanitation increases the risk of a range of health problems. Globally, children under five are the victims of 80 per cent of sanitation-related illnesses and diarrhoeal disease, primarily because of their less-developed immunity and because their play behavior can bring them into contact with pathogens. Diarrhoeal disease also results in higher levels of malnutrition and increased vulnerability to other illnesses, with effects on overall development (36).

As found by the study conducted in northwestern Uganda, children whose families used water from unprotected sources were more underweight than their more fortunate counterparts. However, the source of water had no effect on the incidence of stunting. (37)

The five percent of rural households with access to piped water have to travel one hour, on average, to get to the water source. A significantly higher proportion of urban households nearly 80 percent have access to piped water in or outside their compound. In general, water obtained from surfaces sources, such as river, lake, pond or dam, is considered unsafe. These sources are likely to be contaminated in an environment where there is a lack of sanitation facilities. A significant proportion of the rural populations 42.1% obtain their drinking water from these surface sources. These water sources are likely to be contaminated. The definition of “safe water” used in the analysis tries to capture both aspects of water quality and availability. It includes piped water whether inside or outside of the compound as well as water from a well, as long as access to those sources is less than 30 minutes away from the household (31).

Chapter 3: Methodology

3.1. Methods

3.1.1 Study Area and Period

Dugde Dewa woreda is one of the 13 woreda of Borena Zone, and it's located south of Ethiopia with vast majority of land classified as semi arid. The woreda is located 500 km away from the capital city and from zonal center as Yabello 70km (39). Majority of the habitants of the woreda are Oromo nationalities of Guji tribe followed by Borena tribe and other nations and nationalities. The total population of the zone estimated to be 96,936. It has 14 kebeles in which 13 rural and 1 urban kebeles. According to border delineation, the zone is bordered by Bule Hora woreda in the North, Arero woreda and Guji zone in the East, SNNP National Regional State in the West and yabello woreda in the South (39).

Topographically, the woreda has an elevation in the range 500-1750 meters above sea level. The average rainfall varies from 500mm in low area to more than 700mm in higher area. Rainy season is from mid-March to the beginning of June, which is locally called "Gana" and other (short rain) from mid of September to November which is locally called "Hagaya" (39).

The driest season is December to February and second driest season is June to August. The temperature with daily peaks is December to February 36 ^{0}c to 39^{0}c in March to May 21^{0}c-26^{0}c. Provision of health services is one of the preconditions for human resources development. The woreda has 2-Health centers, 11-Health posts and totally 13 different health facilities available (39).

3.1.2 Study Design

Five Kebeles were selected randomly from the woreda. Selected 6-59 months of age children in the selected villages were the study population.

The study assessed the nutritional status of children by using height and weight scale. The source population was all children 6-59 month of age in pastoralist community of the Woreda and Community based Descriptive method design will be used.

3.1.3 Study Population

From the total 14 kebeles of the woreda five kebeles were selected randomly by using lottery method. The total sample was distributed for each kebeles by using proportional to size allocation. From this kebeles eligible sample of households were selected using simple random sampling technique .Data of 3112 households with children in the age group 6-59 months of age were taken from health extension workers. Depending on the data obtained from HEWs, sampling frame was prepared. For the family that had more than one child within this age the youngest child was selected.

A total of 816 children participated making the response rate 99.7%, with mean age and standard deviation of children 22 ± 12 months. The list of households those who have 6-59 months of age children were obtained from health extension workers. By using the list as a sampling frame a total of 816 children participated in this study.

3.1.4 Inclusion Criteria

1. Children 6 to 59 months of age.

2. Children and parent who resided in the pastoralist area for six or more months before the study began.

3. If more than one child per household is found, to prevent recall bias the youngest one was selected.

3.1.5 Exclusion Criteria

- It might be difficult to take anthropometric measurement from critically sick and grossly deformed child. So, they were excluded.

- Children and parents/care giver who resided less than six month in the study area

3.6 Sample Size Determination and Sampling Technique

3.6.1 Sample Size Determination:

Sample size was determined by using single population proportion formula. The variable considered for sample size calculation was prevalence of stunting because; stunting indicates chronic malnutrition which in turn could indicate the long-term nutritional situation of the pastoralist community. The estimated value was taken from the Ethiopian Demographic and Health Survey (DHS 2005) which was found 41% in Oromiya region.

3.6.2 Sampling Techniques

From the total 14 kebeles of the woreda five kebeles were selected randomly by using lottery method. The total sample was distributed for each kebeles by using proportional to size allocation. From this kebeles eligible sample of households were selected using simple random sampling technique .Data of 3112 households with children in the age group 6-59 months of age were taken from health extension workers. Depending on the data obtained from HEWs.

3.7 Measurements

3.7.1 Data Collection Instruments

Structured questionnaire was used to collect the data which is adapted from different literatures, similar studies and modified according to the local context by the investigator. The questionnaire was initially prepared in English then translated in to Afan Oromo language by different individuals those who had good ability of both languages then again translated back to English to check for any inconsistencies. The questionnaire contains socio-demographic status and factors associated with malnutrition.

3.7.2 Data Collection Method

All the interviews, measurements, observations and testing were conducted at their dwelling compounds of the participants. General information on the family characteristic of the child was collected through house to house visit using questionnaire developed in English and translated to Afan Oromo and pretested. Training on how to conduct the interview and on how to conduct Anthropometric measurement was given to 8 diploma holders of clinical nurses and 2 supervisors of Bsc holders of Nurses by the principal investigator for four days. Mothers of the children were interviewed.

An anthropometric measurement (weight, height) was done for all children included into the study. All anthropometric measurements were taken by trained data collectors and recorded. 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 was 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 was measured to the nearest 1cm. Weight and height measurements were taken three times for every child and the average was taken for analysis.

3.8 Pre-Testing

Before the actual data collection, the questionnaires were pre-tested on 40 individuals of the total sample size in Yabello Woreda, surupa kebele which is outside the study area. The purpose of the pre-taste was to ensure that the respondents are able to understand the questions and to check the wording, logic and skip order of the questions in a sensible way to the respondents. After that modification of the questionnaires were made accordingly after pre-testing.

3.9 Data Processing & Analysis

After data collection, each questionnaire was checked for completeness and code was given before data entry. Data was entered, cleaned, explored for outliers, missed values and missed variables and analyzed using SPSS. Different frequency tables, graphs and descriptive summaries were used to describe the study variables. Bivariate analysis was performed to see the existence of association between dependent and independent variables. Then those variables that show significant association with the outcome variable were included in a single model and multiple logistic regressions were performed. Finally only those independent variables that maintain their association with outcome variables in multiple regressions were used to construct the final models.

3.10 Data Quality Control

To assure the data quality, data collection tool was prepared after intensive reviewing of relevant literatures and similar studies. Initially the questionnaire was prepared in English then translated to Afan Oromo and back to English by different individuals, those who had good ability of both languages. Training was given for both data collectors and supervisors by the principal investigator.

To reduce recall bias on the exact age of the child prominent local events were used. All forms of data were reviewed every night by the supervisors and investigator and errors were returned to the data collectors so as to revisit the households.

3.11 Ethical Consideration

Permission from the Borena Zone Administrative officials and leaders of Woreda Administration and Woreda Health Office additionally with leaders of peasant associations was obtained before the actual field activities started.

Verbal consents were obtained from the Parents/guardians of the participants of the study after explaining the study objectives and procedures. Results of this study will be provided to public health planner of the Woreda and in the Zonal Health Department.

3.12 Operational Definition

Agro pastorals= people who are practicing producing crops and herding as economic activity of their family income.

Anthropometry= refers to measurement of variations of physical dimension and gross composition of human body at different levels and degrees of nutrition (Jelliff, 1966).

Family size: - The total number of people lives in a house during the study period.

Literacy: - Ability to read and write.

Pastoral = peoples who are practicing of herding as the primary economic activity of their Family income.

Parent: - Biological father and mother.

Diarrhea: - Three or more loose stools over a period of 24 hours.

Malnutrition= Malnutrition is a state of nutrition in which a deficiency or excess (or imbalance) of energy, protein, and other nutrients causes measurable adverse effects on tissue/body form (body shape, size and composition) and function, and clinical outcome.

Chapter Four : Data presentations and Results

4.1- Socio Demographic Characteristics

The age ranges of children considered in the study were 6-59 months of age. Majority of children, which accounted for 673(82.5), were aged 6- 36 months. From the total study participants 442(54.2%) were males and 374(45.8%) were females respectively (Table 4.1).

Table 1 shows that 582(71.3%), of mothers were below the age of 36 years. Regarding family size 737(90.3%) of the respondents had greater than or equal to four family members. Of the total respondents 621(71.6%) of them had more than one 6-59 months of children. And 653(80%) mothers reported that, they had given birth for three or more children.

In the majority of the respondents, 812(99.5%), of them the head of the house hold were male. All of the respondents were Oromo. More than three fourth, 625(76.6%) of the respondents were protestant, 156(19.1%) of them were 'Wakefeta', and the rest of them were Muslim and orthodox. Regarding education status 754(92.4%) of mothers were illiterate. Of all interviewed Mothers, 797(97.7%) of them were married, 10(1.2%) of them were Divorced, and the rest of them were widowed. When we see the ownership of the house about 792(97.1%) of the house was owned by the respondent. Around half of the respondents, 398(48.8%), reside in the house which had only one room (Table 4.1).

This finding shows that, 403(49.3%) of them get monthly more than 500 birr, and 413(50.6%) of them got more than 500 birr. Since they are pastoralist community, 813(99.6%) of them had different type of domestic animals. From the total sample, 3(0.4%)

of them don’t have any of domestic animals because they lost them due to drought. Maize was their essential food for almost all of the respondents, 815(99.9%), (Table 4. 1).

Table 4.1: Socio-demographic and other family characteristics of Mothers or respondents

Socio-demographic characteristics	Number	Percent (%)
Age of the Mother (year)		
15-24	181	22.2
25-34	401	49.1
35-44	217	26.6
≥45	17	2.1
Sex of the child		
Male	442	54.2
Female	374	45.8
Age of the child(month)		
6-11	180	22.1
12-23	259	31.7
24-35	234	28.7
36-47	96	11.8
48-59	47	5.8
Family Size		
<4	199	24.4
≥4	617	75.6
Number of children 6-59 month of age		
1	195	23.9
>=2	621	76.1
Head of the House Hold		
male	812	99.5
female	4	.5
Religion		
Orthodox	11	1.3
Muslim	24	2.9
protestant	625	76.6
"Wakefetta"	156	19.1
Educational status		
Illiterate	754	92.4
read and write	35	4.3
elementary	16	2.0
secondary(+)	11	1.3
Ethnicity		
Oromo	816	100.0
Marital status		
Married	797	97.7
Divorced	10	1.2
Widowed	9	1.1
Ownership of the house		
Owned	792	97.1
Dependent	24	2.9
Work of the head of the House Hold		
Agro pastoralist	48	5.8
Pastoralist	749	91.8
Government employer	5	0.6
self-employee	6	0.7
Merchant	5	0.6
No work	3	0.4
Income in birr		
≥500	403	49.4
<500	413	50.6

4.2-Environmental Health Characteristics

Of all 816 households, 772(94.6%) of them were using unprotected water source, in which 668(81.9%) from unprotected well and 104(12.7%) from surface water like river and small lakes (Table- 4. 2). Almost half of the respondents, 402 (49.3%), had latrine. All were pit latrine. And the rest of them, 414(50.7%), do not had latrine. So; they were used open field to dispose their domestic wastes. None of them had Television, and only 226(27.7%) of them had Radio. Only 5(0.6%) of the respondents house had ceiling. Almost the entire floors of the house of the respondents were made of earth, 814(99.8%). From all respondents 398(48.8%) of them live in the house which has only one room, and the rest of them, 418(51.2%0, live in the house which has two and above rooms (Table- 4. 2).

Table 4.2-: Environmental health characteristics of Mothers / guardian

Environmental Health	Number	Percent (%)
Availability of latrine		
pit latrine	402	49.3
no latrine	414	50.7
Availability of Television		
Yes	0	0.0
No	816	100
Availability of Radio		
Yes	226	27.7
No	590	72.3
Availability of ceiling		
Yes	5	0.6
No	811	99.4
Floor type		
Earth	814	99.8
Wood	2	0.2
Source of drinking Water		
Piped Water	23	2.8
protected Well water	21	2.6
unprotected well water	668	81.9
Surface water	104	12.7
Number of rooms		
1	398	48.8
≥2	418	51.2

4.3-Child Health

Only 4(0.5%) of mothers were assisted by health professionals, during home visit; the rest of them, 814(99.5) were assisted by relatives or neighbors, traditional birth attendants and by trained traditional birth attendants. All children, 816(100%) were not measured weight at birth (Table- 4. 3).

From the total mothers of the children, 741(90.8%) of them were ever breast feed their child and, 524(64.2%) of them were breast feeding their child during the data collection time. Concerning exclusive breast feeding majority of them, 732(98.7%) were breast feed their child exclusively for less than six months, and the rest of them Breast feed their child exclusively for greater than six months. Mothers were asked at what time they breast feed their child and they respond that, they breast feed their child when the child cry 72(8.8%), according to time frequency228 (27.9%) and according to mothers feeling 224(27.5%) respectively (Table 4.3).

Regarding their knowledge on exclusive breast feeding, 799(97.9%) of them respond as they know, exclusive breast feeding is given for the child for less than six months. Most of the respondents, 791(96.9%), give cow milk for the first time for their children during supplementary feeding. Mothers were asked on the frequency of feeding in a day and, 766(93.9%) of them feed their children less than six times, the rest of them, 50(6.1%) feed their children greater than six times. Regarding getting supplementary food from other source only 40(4.9%) of them get food from other source. Regarding immunization service 693(84.9%) of them had immunized and 123(15.1%) of them didn’t get any type of immunization. From the total vaccinated children only, 314(45.3%) of them fully vaccinated. Among children who were reported to have been sick in the last two weeks, 176(21.5%) of

them had developed febrile illness, 159(19.5%) of them developed cough and 104(12.7%) of them developed Diarrhea (Table 4.3).

Table 4.1: Child health care practice of Mothers or respondents

Child Health	Number	Percent (%)
Birth Order		
1-3	346	42.4
4-5	167	20.5
>5	303	37.1
Place of delivery		
At home	816	100.0
Assistance of the delivery		
Health professional	4	.5
TTBAs	141	17.3
TBAs	277	33.9
relatives neighbors	394	48.3
Breast feeding		
Yes	741	90.8
No	75	9.2
Exclusive breast feeding		
before Six month	732	98.7
After six month	9	1.3
Time of supplementation of BM		
when the child cry	72	8.8
According to time frequency	228	27.9
According to mother`s feeling	224	27.5
Feeding frequency of child per day		
<6 times per day	766	93.9
≥6 times per day	50	6.1
Immunization		
Yes	693	84.9
No	123	15.1
Morbidity		
Yes	307	37.6
No	509	62.4
Febrile illness		
Yes	176	21.6
No	640	78.4
Cough		
Yes	159	19.5
No	657	80.5
Diarrhea		
Yes	104	12.7
No	712	87.3

4.4 Factors Associated With Stunting

From all variables which were tried during bi variant analysis the following variables had show significant association with stunting; education status of mother, income, number of children 6-59 months of age, breast feeding, febrile illness and mothers' age at first marriage.

The result of bivariate analysis shows that, stunting was associated with Maternal Education status. A child was found to have a chance to be stunted almost 2.2 times higher from illiterate mothers as compared to children from those mothers who were able read and write. The association was found to be strong even after potential confounders were identified, (AOR= 3.3; 95%CI, 1.5, 6.9). Even though having greater than four family members do not had association with stunting, it was associated with Having more than one 6-59 months of age children, (AOR=2.2;95%CI,1.5,3.3). Having greater than one child in the age group 6-59 months of age will increase the probability of the child being stunted by two fold(Table-4. 4).

Stunting was found to have significant association with house hold income. In those House Holds, where their income were less than 500 birr, the chance of the child to be stunted was almost 4.6 times higher as compared to those households their income were greater than five hundred birr. Even, after it had been adjusted for confounders by using multivariate analysis the association was found to be significantly high (Table- 4.4).

Availability of Latrine had no relationship with stunting. Source of drinking water being Surface water had significant association with stunting. Even after confounding factors were identified by using multivariate analysis, those children from households, who were used surface water, were 4 times more likely to be stunted as compared with those households who were used piped water (Table -4.4).

Table 4.4: **Association of different Factors and the prevalence of Stunting among children**

Stunting (<-2SD)				
Variable	**Yes**	**No**	**COR(95%CI)**	**AOR(95%CI)**
Age of the child				
6-11	68(37.8%)	12(62.2%)	2.5(1.1,5.6)**	5.1(2.1,12.4)**
12-23	95(36.7%)	164(63.3%)	2.4(1.1,5.3)	4.8(2.1,11.6)
24-35	90(38.5%)	144(61.4%)	2.6(1.2,5.7)	4.7(1.9,11.4)
36-47	30(31.2%)	66(68.8%)	2(0.8,4.4)	3.1(1.2,8.2)
48-59	9(19.1%)	38(80.9%)	1	1
Sex of the child				
Male	157(35.5%)	285(64.5%)	0.99(0.7,1.3)	0.91(0.6,1.2)
Female	135(36.1%)	239(63.9%)	1	1
Mother`s age at first marriage				
<18	258(39.6%)	393(60.4%)	2.5(1.7,3.8)**	2.3(1.5,3.6)**
≥18	34(20.6%)	131(79.4%)	1	1
Family Planning				
Yes	72(28.7%)	179(71.3%)	1	1
No	220(38.9%)	345(61.1%)	1.6(1.2,2.2)**	2.2(1.5,3.1)**
Education Status				
Illiterate	279(37%)	475(63%)	2.2(1.2,1.4)**	3.3(1.5,6.9)**
Read and write	13(21%)	49(79%)	1	1
Number of children 6-56 months				
1	54(27.1%)	145(72.9%)	1	1
≥2	238(38.6%)	379(61.4%)	1.7(1.2,2.4)*	2.2(1.5,3.3)**
Family Size				
Less than four	60(30.2%)	139(69.8%)	1	1
greater than or equal to four	232(37.6%)	385(62.4%)	1.4(0.9,1.9)	1.2(0.8,1.8)
Head of the House				
Male	290(35.7%)	522(64.3%)	0.5(0.07,3.9)	0.5(0.05,6.8)
Female	2(50%)	2(50%)	1	1
Religion				
Orthodox	4(36.4%)	7(63.6%)	1.2(0.3,4.4)	1.3(0.3,6.1)
Muslim	6(25.0%)	18(75%)	0.7(0.2,1.9)	1.3(0.4,4.0)
Protestant	233(37.3%)	392(62.7%)	1.2(0.8,1.8)	1.4(0.9,2.1)
Wakeffeta	49(31.4%)	107(68.6%)	1	1
Marital status				
Married	281(35.3%)	516(64.7%)	0.6(0.1,2.5)	0.3(0.07,1.5)
Divorced	7(70%)	3(30%)	0.34(0.4,19.2)	3.4(0.4,32.2)
Widowed	4(44.4%)	5(55.6%)	1	1

Source of drinking water				
Surface Water	14(60.9%)	9(39.1%)	2.6(1.1,6.5)**	4.1(1.5,11.2)**
Protected well	10(47.6%)	11(52.4%)	1.5(0.6,3.8)	1.2(0.4,3.5)
Unprotected well	229(34.3%)	439(65.7%)	0.8(0.5,1.3)	1.0(0.6,1.7)
Piped Water	39(37.5%)	65(62.5%)	1	1
Availability of Latrine				1.2(0.9,1.8)
Pit latrine	144(35.8%)	258(64.2%)	0.99(0.75,1.33)	1
no latrine	148(35.7%)	266(64.3%)	1	
source of income				
selling of Cattle	231(35.1%)	428(64.9%)	0.9(0.4,1.8)	0.9(0.4,2.3)
Selling of Agricultural products	36(37.9%)	59(62.1%)	1.1(0.4,2.3)	1.3(0.5,3.5)
Sell Milk/dairy	13(43.3%)	17(56.7%)	1.2(0.4,3.5)	0.8(0.2,2.9)
Others	12(37.5%)	20(62.5%)	1	1
Income				
≥500	77(19.1%)	326(80.9%)	1	1
<500	215(52.1%)	198(47.9%)	4.6(3.3,6.3)**	5.1(3.6,7.3)**
Sex of the child				
Male	157(35.5%)	285(64.5%)	0.9(0.77,1.3)	1.1(0.8,1.6)
Female	135(36.1%)	239(63.9%)	1	1

4.5-Factors Associated With Wasting

The association between wasting and socio demographic and economic variables, environmental and child health care variables were assessed. Wasting appeared to be influenced more by source of water from unprotected well source. After confounding factors were identified by using multivariate analysis the finding shows, the source of drinking water being unprotected well can expose the child 3.8 times more likely to be wasted. Even though there was no association between using water from surface water and stunting, the study reviled children from parents who used surface water were 3.2 times more likely to be wasted than those who used piped water (Table 4. 5).

Wasting was also significantly associated with breast feeding and it was one of the predictor variables. Those children who didn't get breast milk were 3.2 times more likely for

developing wasting than those who ever get breast milk. Those children who feed less than six times per day had a great chance to be wasted than those who feed greater than six times per day; but it doesn't show significant association (Table 4. 5).

Income was also one of the factor which shows significant association with wasting. Households that had monthly income less than 500 birr had 2.5 times higher chance to develop wasting than those who had greater than 500 birr. And the association remained high after it had been adjusted for confounders. Its association with regard to other relevant variables was not statistically significant.

Table 4.5-**Association of different Factors and the prevalence of Wasting among children**

Wasting(<-2SD)				
Variable	Yes	No	COR 95%CI)	AOR (95%CI)
Age of the child				
6-11	18(10%)	162(90%)	1.2(0.4,3.7)	1.2(0.3,3.9)
12-23	21(8.1%)	238(91.9%)	0.9(0.3,2.9)	0.9(0.3,3.1)
24-35	22(9.4%)	212(90.6%)	1.1(0.4,3.4)	1.1(0.3,3.5)
36-47	10(10.4%)	86(89.6%)	1.2(0.3,4.2)	1.2(0.6,2.2)
48-59	4(8.5%)	43(91.5%)	1	1
mother`s age at first marriage				
<18 years	55(8.4%)	596(91.6%)	0.7(0.4,1.2)	0.6(0.3,1.1)
≥18 years	20(12.1%)	145(87.9%)	1	1
Number of children 6-59 months				
1	15(7.5%)	184(92.5%)	1	1
≥2	60(9.7%)	557(90.3%)	1.3(0.7,2.4)**	1.2(0.6,2.2)
Income				
≥500	22(5.5%)	38(94.5%)	1	1
<500	53(12.8%)	360(87.2%)	2.5(1.5,4.3)**	2.5(1.5,4.2)**
Drinking Water source				
Surface Water	2(8.7%)	21(91.3%)	3.2(0.5,20.4)	3.2(0.5,20)
Protected well	2(9.5%)	19(90.5%)	3.5(0.5,22.6)	3.5(0.5,22.6)
Unprotected well	68(10.2%)	600(89.8%)	3.8(1.2,12.4)*	3.8(1.2,12.6)**
Piped Water	3(2.9%)	101(97.1%)	1	1
Availability of Latrine				
Pit latrine	38(9.5%)	364(90.5%)	1.1(0.6,1.7)	0.9(0.6,1.6)
no latrine	37(8.9%)	377(91.1%)	1	1
Breast Feeding				

Yes	57(7.7%)	684(92.3%)	1	1
No	18(24%)	57(76%)	3.8(2.1,6.8)**	3.2(1.8,6.1)**
Exclusive breast feeding				
<6 months	80(10.9%)	656(89.1%)	1	1
≥ 6 months	2(22.2%)	7(77.8%)	2.3(0.5,11.5)	1.3(0.2,11.5)
No exclusive breast feeding	13(18.3%)	58(81.7%)	1.8(0.9,3.5)	0.2(0.03,1.8)
Feeding frequency of child per day				
≤6 times	73(9.5%)	693(90.5%)	2.5(0.6,10.6)	2.3(0.5,9.8)
>6 times	2(4.0%)	48(96.0%)	1	1
Immunization				
Yes	63(9.1%)	630(90.9%)	0.9(0.5,1.7)	0.8(0.4,1.7)
No	12(9.8%)	111(90.2%)	1	1
Morbidity				
Yes	51(10%)	458(90%)	1.3(0.8,2.1)	1.4(0.8,2.4)
No	24(7.8%)	283(92.2%)	1	1
Febrile illness				
Yes	10(5.7%)	166(94.3%)	0.5(0.3,1.1)	
No	65(10.2%)	575(89.8%)	1	
Diarrhea				
Yes	13(12.5%)	91(87.5%)	1.4(0.8,2.8)	
No	62(8.7%)	650(91.3%)	1	

4.6-Factors Associated With Underweight

The association between underweight and different variables was assessed. There was no statistical significant association between underweight and having more than one 6-59 months of age children, children from family who had greater than one child in the age group 6-59 were 1.6 times more likely to be underweight than children from family who had one child in the age group 6-59 months of age, (AOR=1.6; 95%CI, 0.8, 3.0).Regarding family size children from less than four family members had less likely to be underweight (Table 6). During bivariate analysis breast feeding show significant association with underweight, but after confounding factors were identified, the association couldn't persist, (AOR=1.5;95%CI,0.8,2.9).Though no association between feeding frequency and underweight, children who feed less than six times per day were 1.5 times more likely to be underweight than those who feed greater than six times per day. Children from illiterate mothers were 2 times more likely to be underweight than those children from mothers who

can read and write, (AOR=2; 95%CI, 0.7, 5.9), but it wasn't show significant association (Table4. 6).

Income had significant effect for being underweight. Children from the family which get less than 500 birr were 5.5 times more likely to be underweight, (AOR=5.5;95%CI,3.2,9.4). Among the major disease assessed during bivariate association, those children who had diarrheal disease were 2.4 times more likely to be underweight and it shows significant association (Table 4.6).

Table 4.6- Association of different Factors and the prevalence of underweight among children

Underweight(<-2SD)				
Variable	**Yes**	**No**	**COR(95%CI)**	**AOR(95%CI)**
Age of the child				
6-11	26(14.4%)	154(85.6%)	2.5(0.7,8.5)	2.2(0.6,7.8)
12-23	26(10.0%)	233(90.0%)	1.6(0.5,5.6)	1.4(0.4,5.0)
24-35	28(12.0%)	206(88%)	1.9(0.6,6.8)	1.7(0.5,6.0)
36-47	12(12.5%)	84(87.5%)	2.0(0.5,7.8)	1.8(0.4,6.8)
48-59	3(64.0%)	44(93.6%)	1	1
Number of children 6-59month				
1	16(8.0%)	183(92.0%)	1	1
≥2	79(12.8%)	538(87.2%)	1.7(0.9,2.9)	1.6(0.8,3.0)
Family Size				
Less than four	13(12.7%)	89(87.3%)	0.7(0.4,1.3)	0.8(0.5,1.5)
greater than or equal to four	82(11.5%)	632(88.5%)	1	1
Education Status				
Illiterate	91(12.1%)	663(87.9 %)	1.9(0.7,5.6)	2(0.7,5.9)
Read and write	4(6.5%)	58(93.5%)	1	1
Income				
≥500	18(4.5%)	385(95.5%)	1	1
<500	77(18.6%)	336(81.4%)	4.9(2.9,8.4)	5.5(3.2,9.4)**
Source of drinking Water				
Surface water				
Protected well	2(8.7%)	21(91.3%)	0.7(0.1,3.5)	0.8(0.1,4.1)
Unprotected well	2(9.5%)	19(90.5%)	0.8(0.1,3.9)	0.7(0.1,3.5)
Piped Water	79(11.8%)	589(88.2%)	1.1(0.5,1.9)	1.1(0.5,2.2)
	12(11.5%)	92(88.5%)	1	1
Availability of Latrine				
Pit latrine	45(11.2%)	357(88.8%)	0.9(0.6,1.4)	0.9(0.6,1.6)
no latrine	50(12.1%)	364(87.9%)	1	1

Breast Feeding				
Yes	80(10.8%	661(89.2%)	1	1
No	15(20%)	60(80%)	2.1(1.1,3.8)**	1.5(0.8,2.9)
Exclusive breast feeding				
<6 months				
≥ 6 months	247(33.5%)	490(66.5%)	1	1
No exclusive breast feeding	1(12.5%)	7(87.5%)	0.2(0.03,2.3)	0.1(0.01,1.2)
	44(62.0%)	27(38.0%)	3.2(1.9,5.3)**	2.9(0.5,16.4)
Feeding frequency of child per day				
≤6 times	92(12%)	674(88%)	2.1(0.6,2.4)	1.5(0.4,5.2)
>6 times	3(6%)	47(94%)	1	1
Immunization				
Yes	83(12.0%)	610(88.0%)	1.2(0.3,6.5)	1.1(0.6,2.3)
No	12(9.8%)	111(90.2%)	1	1
Morbidity				
Yes	60(11.8%)	449(88.2%)	1.1(0.7,1.6)	1.02(0.6,1.6)
No	35(11.4%)	272(88.6%)	1	1
Diarrhea				
Yes	19(18.3%)	85(81.7%)	1.9(1.1,3.2)**	
No	76(10.7%)	636(89.3%)	1	
Febrile illness				
Yes	19(10.8%)	157(89.2%)	0.9(0.5,1.5)	
No	76(11.9%)	564(88.1%)	1	
Cough & difficulty to breath				
Yes				
No	19(11.9%)	140(88.1%)	1.1(0.6,1.7)	
	76(11.6%)	581(88.4)	1	
Age at first marriage				
<18	79(12.1%)	572(87.9%)	1.3(0.7,2.3)	1.1(0.5,1.8)
≥18	16(9.7%)	149(90.3%)	1	1

Chapter Five-Discussion

Malnutrition can be described in Ethiopia as a long-term year round phenomenon due to inadequacies in food intake combined and cause for illness due to immediate causes of malnutrition. It is not a problem found uniquely during drought years. It is a year round problem found in the majority of households especially in pastoralist community.

Malnutrition develops when the body does not get the proper amount of energy (calories), proteins, carbohydrates, fats, vitamins, minerals and other nutrients required to keep the organs and tissues healthy and functioning well. A child or adult can be malnourished by being undernourished or over nourished. In most parts of the world malnutrition occurs when people are undernourished.

Primary reasons for undernourishment, especially of children and women, are poverty, lack of food, repeated illnesses, inappropriate feeding practices, lack of care and poor hygiene. Undernourishment raises the risk of malnutrition. The risk is greatest in the first two years of life. The risk further increases when diarrhea and other illnesses sap the body of the proteins, minerals and nutrients required to stay healthy.

This cross sectional study revealed that, malnutrition was one of the major nutritional problems. According to the result of this study, the prevalence of stunting was high in relation to wasting and underweight with 35.8%. When we compare it with pastoralist regions, Somali (45.2%) and Afar region (40.8%) report it was lower. This might be due to the difference in feeding frequency, food security at house hold level, lack of knowledge of the care givers to provide balanced diet to their children and time variation between the

studies; it was also lower when we see it with the national report of Ethiopian Demographic and Health survey, 2005, which was 47%. And it was consistent with the study conducted in Nigeria with the prevalence of stunting 38.7% (14, 46).

The research data was compiled and statistics was performed and the association was studied in relation to family income, family size, and number of children within the age group 6-59 months of age, sex of the child and other relevant variables.

Acute malnutrition (wasting) reflects the nutritional deficiency of recent incidence caused by inadequate food intake and infections. According to this study from the total study subjects, the prevalence of wasting accounts 9.2%. It was similar with the prevalence of Afar region and Oromiya region 9.9% and 9.6 respectively (14). However, it was greater than the prevalence of Addis Ababa which was 1.7% and the result obtained at Alexandria, Egypt which was 3.6% (14, 28). This might be due to the variation in maternal knowledge on breast feeding, the difference in infectious diseases and different socio-economic and cultural factors between the two communities. And it was lower than the result obtained in Ghana which was 11.4% (21).

Underweight is a composite index, which reflects either wasting or stunting, or a combination of both. Rapidly changing weight for age can be assumed to be the result of changing weight for height, while low weight for age among older children is more likely to be the result of low height for age and it is one of the major nutritional problems. Depending on this study about 11.6% of the study subjects were below the standard weight. This result was lower than Oromiya regional report, 34.4%(14) and it was inconsistent with the national EDHS, 2005

and the study conducted in Tigray region which was 38.3%.and it was also inconsistent with the study conducted in Pakistan (43).

According to the finding of this survey, prevalence of stunting was found to be high among male sex than female children which was 53.8%. But there was no significant association being male or female. It is inconsistent with study conducted at Gilgel Gibe but, it shows consistency with study conducted in Nigeria, and Tanzania (41, 42, and 46).

The prevalence of stunting changed from 8.3 % in children six months to eleven months, to 22.6% in children between 12 months and 35 months. The risk for malnutrition increased with age in both sexes up to the age of three and then relatively decreases as age increases. Those children in the age group 6-11 months of age had 5 times higher chance to be stunted.

Strength and Problems

Strength

*Starting from the development of the proposal to the final result to keep the validity of the data different actions were taken. To mention some of them: the use of different statistical methods such as bivariate and multivariate analysis, to control possible confounding factors, pre testing of the questionnaires before the actual data collection was undertaken and possible modification of the questionnaire was made according to the area context. Standardized weighing scale and height/length board were used. Additionally, daily check up of filled questionnaires and measuring instruments were made.

Problem

*Even though different strategies were undertaken there were some limitations. some of them were: Respondent might have not told us real information about their socio economic status, because of the need to get support. This could have brought some differences in association of variables. Since the study design was cross-sectional, which measure the exposure and out come at the same time, it cannot measure the cause and effect relationship. Different methods were used to had the précised age of the child, reasonably Precise Age in Children is difficult to know

Chapter Six- Summary ,Conclusions and recommendations

6.1 Summary

Ethiopia is a country located in the Horn of Africa. The country covers approximately 1,221,900 square kilometers and shares frontiers with Sudan, Kenya, Somalia, and Djibouti. The country has a general elevation ranging from 1,500 to 3,000 meters above sea level. Addis Ababa is the capital city of the country.

61% of the Ethiopian land mass and more than 12% of the total population of the country belongs to the pastoral and agro pastoral area where poverty and other associated problems are rampant. This study is focusing on one of the pastoral and agro pastoral areas of Dugda Dawa district where malnutrition is the main problem of the community. The study addressed the following objectives

- To determine prevalence of stunting of children 6 to 59 months of age in the study area
- To estimate prevalence of wasting of children 6 to 59 months of age in the study area
- To assess the knowledge and practice of mothers/caretakers on complementary and supplementary feeding of the child

Accordingly in an endeavor to address objectives the following research questions were formulated and addressed in the course of the study.

- What are the major contributing factors for malnutrition in community understudy
- What prevalence of stunting of children 6 to 59 months of age in the study area
- What prevalence of wasting of children 6 to 59 months of age in the study area
- What are the knowledge and practice of mothers/caretakers on complementary and supplementary feeding of the child

Descriptive survey research design was employed to undertake the study. From the total 14 kebeles of Dugda Dawa district, five kebeles were selected randomly by using lottery method. The total sample was distributed for each kebeles by using proportional to size allocation. From the 3112 households residing in the district, the list of households that have 6-59 months of age children were taken as a sampling frame and 816 children within the age of 6 -59 months were selected as study participants.

The findings in the research indicate that the morbidity rate identified in the study subjects using symptom complex such as: diarrhea, fever and chills, and cough and difficulty to breathe in the last two weeks. During bi variant analysis febrile illness shows significant association with wasting. But in multivariate analysis no significant different was observed in stunting and morbidity. Age at first marriage had significant association with stunting. Children from those mothers who got marriage before the age of eighteen were 2.3 times more likely to be stunted than children from those mothers who married after the age of eighteen.

Magnitude of Stunting was found to be very high with 35.8%, underweight 11.6% and wasting 9.2%, among children of the Woreda

Generally in this study, it was observed that childhood malnutrition was among the main nutritional related problems of the population of Dugde Dawa Woreda and different factors were interrelated to cause child malnutrition. The effect of nutritional problems affects survival of individuals and development at the family, society and even at the national level.

Moreover, Health, food security, child care require special attentions to achieve rapid reduction in child malnutrition. Access to education, healthcare, safe water, and environmental sanitation are the key elements to alleviate this problem.

6.2-Conclusion

- Based on the study findings, Maternal educational status , income, Water source, Number of under five children in the house hold, breast feeding, age at first marriage were found to be a major associated factors for chronic malnutrition or stunting.
- Using unprotected water source, breast feeding and income were variables which show association with wasting. So, they are the major predictors of wasting.
- Child morbidity can aggravate malnutrition; another key association was identified between having diarrheal disease and underweight. And income was also found the main predictor of underweight.
- Income was the variable which show significant association with all nutritional problems, (Stunting, wasting and underweight), breast feeding were found the predictor for both stunting and wasting.
- Breast feeding was one of the variable which shows significant association with stunting. Children those ever not breast feed had great chance to be stunted.
- Feeding the children for less than six times per day will increase the chance to be stunted.
- Child Immunization, the sex of the head of the House Hold, and sex of the child were not significantly associated with stunting

6.3. Recommendations

The multi-faceted nature of the causes of malnutrition can effectively be alleviated by multispectral approach in order to co-ordinate and prevent duplicating and contradicting each other during planning and implementation. Therefore,

- To that end Food and nutrition policy will be an important tool for bringing this harmony both conceptually and practically. Consequently there is a need for regional health bureau to develop regional food and nutrition policy in harmony with participation of community and other organizations.
- Zonal Health Departments should go to the grass root level and undertake continuous supportive supervision especially to alleviate the root cause of nutritional problem in that area. And also should support the Woreda by providing financial as well material support.
- Woreda Health office should give due attention in tackling this problem by giving training for health workers, by educating the community on feeding frequency, exclusive breast feeding, family planning and on environmental sanitation. And also income generating conditions should have to be facilitated for communities in harmony with other stakeholders. They have to work hard in improving water supply in harmony with different governmental and nongovernmental stake holders so as to decrease water born disease and for the improvement of child. Additionally they have to facilitate the condition and open their door for different nongovernmental organizations those who work on nutrition.
- Health Extension workers should work hard in tackling nutritional problem due to lack of awareness by educating the community on proper breast feeding of the child, feeding frequency of the child, encouraging programs to improve women role and education, combined with child feeding practice.

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QUESTIONNAIRES –ENGLISH VERSION

SECTION- I. Socio-demographic and economic characteristics

Instruction: Ask the youngest child's mother/caretaker

S.No	Question	Response category	Code
1.1	What is your name?(Respondent)		
1.2	What is your age (in completed year?)		
1.3	Name of the father	----------	
1.4	Family size		
1.5	Number of 6-59 months of age children living in the house?		
1.6	Who is the head of the house?	1. Male 2. Female	
1.7	What is your religion?	1. Orthodox 2. Muslim 3. Catholic 4. Protestant 5. Others ----------	
1.8	What is your education status?	1 = Illiterate 2 = Read and write 3 = The higher class completed	
1.9	What is your ethnicity?	1. Oromo 2. Amhara 3. somale 4. Gurage 5. Others specify----------	
1.10	What is your marital status?	1. Married and in union 2. Married lived separately 3. Divorced 4. Widow 5. Never married 6. No response	
1.11	What is the ownership of your house?	1. Owned 2. Rented 3. Dependent 4. Others ----------	
1.12	How many rooms are there in the house?	Number of Rooms -------	
1.13	What is the main source of drinking water for members of your household?	1. Piped water 2. Well water 3. Surface water (river, spring) 4. Others specify---------	

1.14	What kind of toilet facility does your household have?	1. Flush toilet 2. Pit latrine, private 3. Pit latrine, shared 4. No facility / Bush / Field	
1.15	Does your household have electricity?	1. Yes 2. No	
1.16	Does your household have a radio?	1. Yes 2. No	
1.17	Does your household have a television?	1. Yes 2. No	
1.18	Could you describe the main material of the floor in your dwelling?	1. Earth 2. Wood planks 3. Cement 4. Ceramic Tiles 5. Carpet	
1.19	Does your house have a ceiling?	1. Yes 2. No	
1.20	What is your occupation?	1. Pastoralist 2. Agro pastoralist 3. Agriculturist 4. Private Sector Employee 5. Government employee 6. NGO employee 7. Self employee 8. Daily laborer 9. Merchant 10. No work (skip to 221) 11. Others specify -------	
1.21	What is the main source of income for your family?(tick one)	1. Sell cattle/other animals 2. Sell agricultural products 3. Sell milk/other dairy prod 4. Others _____	
1.22	What is the monthly income of your husband/partner? A. In cash B. In kind	1. Less than Birr 500 2. Birr 500 - Birr 1000 3. Birr 1001- Birr 1500 4. More than Birr 1500	
1.23	Do you have domestic animal?	1. yes 2. No	
1.24	If yes, how many do you have of the following?	Cattle ----- oxen ---- Sheep ---- Goat ---- Camel --------	

		Horse ----- Donkey ---- Mule ---- Poultry ------ Others ---------	
1.25	What is your staple food?	1. Teff 2. Maize 3. Barley 4.Sorghum 5. others specify----------	

Section II Information on Characteristics of children aged 6-59 months
Instruction: The next set of questions is about your child –the youngest child

S.No	Question	Response category	Code
2.1	Name of the child	----------	
2.2	Birth order	----------	
2.3	What is the age of your child? (youngest child)	In months----------	
2.4	What is the sex of your child? (youngest child)	1.Male 2. Female	
2.5	Place of delivery of your youngest child	1.At health facility 2.At home	
2.6	Who assisted you at delivery of the youngest child?	1.Health professional 2.Trained Birth Attendant 3.Traditional Birth Attendant 4.Relatives/Friend/Neighbour 5.Others ----------	
2.7	Was your child weighed at birth (The youngest child)	1.Yes 2.No (Skip to 2.9)	
2.8	If yes, How much did your child Weigh? (Record weight from health card, if available)	Grams from: - Card---------- Recall ---------- 98 = Don't know	
2.9	Did you ever breast feed your child?	1.Yes 2. No (skip to 2.13)	
2.10	If yes, for how many months did you breastfeed your child exclusively?	In months ----------	
2.11	Is the child breast feed now?	1. Yes 2. No	
2.12	If yes, when is breast feed given?	1. When child cry 2. According to time frequency 3. According to mothers feeling 4. Other specify	
2.13	For how long do you think should a	In months	

	child exclusively breast feed?		
2.14	At what age do you think that a child given supplemental feeding?	1. Before 4 months 2. 4 to 6 month 3. 7 to 9 months 4. 10 to 12 months 5. After 12 months	
2.15	At what age was your child weaned?	In months ----------	
2.16	What was the first supplementary food given to the child?	1. Milk 2. Genfo 3. Soup 4. Other	
2.17	At his age, how frequent your child get food?	1. Less than 3 times 2. 3-4 times 3. 5-6 times 4. Greater than six times.	
2.18	At his age, how frequent should the child eat?	1. Less than 3 times 2. 3-4 times 3. 5-6 times 4. Greater than six times.	
2.19	At his age, what type of food or drink is not allowed to be taken by the child?	1. meat 2. alcohol 3. coffee 4. others	
2.20	Has the child been ill with Febrile illness at any time in the last two weeks?	1. Yes 2. No (skip to2.23) 98 = Don't know	
2.21	If the answer for 2.20 is yes, did you seek advice or treatment for the Febrile illness?	1. Yes 2. No (skip to2.23)	
2.22	If the answer for question 2.21 is yes, where did you seek advice/treatment?	1. Public Sector (Hosp., HC, Clinic, HP,) 2. Private Medical Sector (Hosp.,Clinic,Pharmacy) 1. Traditional Practitioner 2. Others----------	
2.23	Has the child been ill with cough at any time in the last two weeks?	1. Yes 2. No (skip to 2.27) 98 = Don't know	
2.24	If the answer for question 2.23 is yes, during a cough, did he/she Breathe faster than usual with short, fast breaths?	1. Yes 2. No 98 = Don't know	
2.25	If the answer for 2.24 is yes, did you seek advice or treatment for the	1. Yes 2. No	

	cough?	(skip to 2.27)	
2.26	If the answer for question number 2.25 is yes, where did you seek advice/treatment?	1Public Sector (Hosp.,HC., Clinic, HP,) 2.Private Medical Sector (Hos.,Clinic, Pharmacy) 3.. Traditional Practitioner 4. others----------	
2.27	Has the child had diarrhea in the last two weeks?	1.Yes 2.No (skip to 2.31) 98 = Don't know	
2.28	If the answer for question number 2.27 is yes, number of bowel movements	1.Three times 2.More than four times 98 = Don't know	
2.29	If the answer for question 2.28 is yes, did you seek advice or treatment for the diarrhea?	1.Yes 2.No (skip to 2.31)	
2.30	If the answer for question number 2.29 is yes, where did you seek advice/treatment for the diarrhea?	1. Public Sector (Hosp., HC, Clinic, HP) 2.Private Medical Sector (Hosp., Clinic, Pharmacy) 3.Traditional Practitioner 4.Home remedy (water, sugar, salt)	
2.31	Is your child vaccinated? (See card)	1.Yes 2.No (skip to 2.33)	
2.32	If the answer for question number 2.37 is yes, what type of vaccination does he/she take?(circle one of the two) A) From Card () B) Mother's Report ()	1. BCG only 2. BCG, DPT1, Polio1 3. BCG, DPT1 – 2, Polio1 – 2 4. BCG, DPT1 – 3, Polio1 – 3 5. BCG, DPT1-3, Polio1-3, Meseales	
2.33	Is your child got additional food from Aiding organizations?	1.Yes 2.No (skip to 2.41)	
2.34	If yes from where he/she get the food?	1. TFS 2. Safety net 3. WFP 4. MERLIN 5. Others/specify	
2.35	For how long period did the child get this food?	In months ----------	
2.36	Anthropometric measurement	1st 2nd 3rd Average Weight ---- ----- ------ -------- Height ---- ----- ------ --------	
2.37	Does the child have edema?	1. Yes 2. No	

Section III: Questions about mother/caretaker:-

S.No	Question	Response category	Code
3.1	At what age you get your first marriage?	In year ----------	
3.2	At what age you get your first delivery?	In year ----------	
3.3	Number of pregnancies	In number ----------	
3.4	Number of children alive:-	Male ---- Female ----	
3.5	Are they all alive?	1. Yes (skip to 3.7) 2. No	
3.6	If there is death, specify the cause?	Diarrhea ---- Cough ---- Febrile illness and chills ---- Accidents ----- Others ----------	
3.7	Have you ever faced abortion?	1. Yes 2. No (skip to 3.9)	
3.8	If there is abortion, how many times?	In number ----------	
3.9	Have you ever used birth control method?	1. Yes 2. No (skip to 3.11)	
3.10	If yes, what type?	1. Pills 2. Injection 3. Condom 4. Others	
3.11	Do you usually work out-side home?	1. Yes 2. No	
3.12	Have you got enough time to prepare food?	1. Yes 2. No	
3.13	Do you usually take your child to health institution when sick?	1. Yes (skip to 3.15) 2.No	
3.14	If not, where do you prefer to take?	----------	
3.15	How do you usually prepare food for children under five year of age?	1. Together with adult food 2. Separately for them	

QUESTIONNAIRES –AFAN OROMO VERSION

Kuutaa- I. Gaafilee Haala wali gala maatii sana irratti xiyyeeffatu

Lakk	Gaafii	Deebii	Code
1.1	Maqaan kee enyuu?		
1.2	Ganni kee meeqaa (waggaan?		
1.3	Maqaa abbaa	----------	
1.4	Bay`ina maatii		
1.5	Baay`ina ijoolee ji`a 6-59		
1.6	Who is the head of the house?	3. Dhira 4. Dhalaa	
1.7	Maqaan abbaa enyuu?		
1.8	Amantiin keessan maal?	1. Orthodox 2. Muslim 3. Caatoliki 4. Protestaant 5. Others ----------	
1.9	Sadarkaan barumsa kee?	1 = kan hin baratiin 2 = Dubisuuf berressu 3 = sadarkaa tokkoffa (1-6) 4 = sadarkaa lammaffa (7-12) 5 = (12^{+})	
1.10	Sabnii keessan maal?	1. Oromo 2. Amhara 3. somale 4. Gurage 5. Others ----------	
1.11	Haali fudhaaf heerumaa?	1. kan fudheef kan waliin jiraatu 2. kan fudheef kan waliin hin jiraane 3. Addaan baanee 4. abbaan manaa du`e jira 5. Hin funee 6. deebin hin jiru	
1.12	Manii isin keessa jiraattan kan eenyutii?	1. kan dhunfaa 2. kirraa 3. Nama waliin jiraachuu 4. kan biraa ----------	
1.13	Baayini kutaa mana keessani meeqaa?	Baay`ina kuutaa -------	
1.14	Maddii bishaan dhugaatii maatii keessanitiif eessarraa?	1. Bishaan boonbaa 2. Bishaan qulqullu(Well water) 3. Bishaan lafaa (laga,haaroo) 4kan biraa---------	
1.15	Manii fincaani kan isiin itti fayadamtan kan akkamitii?	1. mana fincanii bishaanin hojjatu 2. Mana fincaani Aadaa 4. Hin jiru	
1.16	Maatiin keessan madda elektrikaatii ni fayyadamaa?	1. Eyeen 2. mitii	
1.17	Maatiin keessan raadiyoo ni qabaa?	1. Eyeen 2. mitii	
1.18	Maatiin keessan Teleevizhinii ni qabaa?	1. Eyeen 2. mitii	
1.19	Keesson lafa mana keessanii maal inni?	1. lafa 2. muuka 3. simintoo	

1.20	Manni keessan koornissi qabaa?	1. Eyeen 2. mitii	
1.21	Hojiin abbaa manaa maal?	6. Horsiisee bulaa 7. Horsisaaf qotee bulaa 8. qotee bulaa 9. Qacaramaa hojii dhunfaa 10. Hojjataa motumaa 6. Hojjataa NGO 7. hojii dhunfaa/ofii 8. hojjataa guyyaa 9. Daldaalaa 10. Hojii hin qabu (gara gaafi1.23tii utaali) 11. kan biraa -------	
1.22	Galiin keessan ji`aan meeqaa?	1. Birri 500 gad 2. Birri 500 - 1000 3. Birri 1001- 1500 4. Birri 1500 ol 98 = hin beeku	
1.23	Hoorii manaa ni qabduu?	1. Eyeen 2. mitii	
1.24	Yoo qabaatan,bay`inii isaanii meeqaa?	horii ----- qootiyyo---- Holaa ---- Re`e ---- Gaala -------- haaree ---- luukku ------ kan biroo ---------	
1.25	Nyaanii yeroo bay`ee nyaattan maal?	1. xaafii 2. Boqollo 3. Garbuu 4.Missingaa 5. Qamadii 6. kan biraa----------	

Kutaa II Gaafilee Daa`ima irratti xiyyeffatuu

Lakk	Gaafii	Deebii	Code
2.1	Maqaa daa`imaa?	----------	
2.2	daa`ima meeqafaatii?	----------	
2.3	Ganii isaa meeqaa? (youngest child)	Ji`aan	
2.4	Saala (youngest child)	1.Dhira 2. Dhalaa	
2.5	Essatii dhalatee/tte?	1.Dhabbilee fayyaatii 2.Manatti	
2.6	Gargaarsa eenyutiin dhaluu dandessee?	1.Hojjatoota Fayyaatiin 2.Dessistoota leenji`aniin 3.Deesistoota Aadaatiin 4.Olaa/hiriyaatiin 5.Kan biraa ----------	
2.7	Daa`imtii yoo dhalatu ulfinii isaa madaalamee jiraa? (The youngest child)	1.Eyeen 2.mitii (gara 2.11tii utaalii)	

2.8	Yoo madaalamee jiraatee ulfinii isaa haamam turee?	Graamii kaardirra---------- yaadachuu ---------- 98 = Hin beekuu	
2.9	Daa`ima kee haarma hoosistee beektaa?	1.Eyeen 2.mitii (gara 2.15tii utaalii)	
2.10	Yoo hosistee jiraattee,ji`a meeqaatiif haarma qoofa hoosistee?	1. ji`a 4 gad 2. Ji`a 4 - 6 3.Ji`a 7 – 9 4. Ji`a 10 – 12 5. Ji`a 12 ol	
2.11	Yeroo ammaa daa`imti kee haarma hoodhuuti jiraa?	1.Eyeen 2.mitii	
2.12	Yoo daa`imtii yeroo amaatii hodhutii jiraatee, yeroo kamitti haarma keenitaaf?	1. yoo daa`imti booyu 2. Haala yerootin wal qabate 3. Feedhi Haadharraa ka`udhaan 4. Kan biraa	
2.13	Haama ji`a meeqaatii daa`imtii tookko haarma hadhaa qoofa argachuu qabaa jatee yaaddaa?	Ji`aan	
2.14	Daa`imti tookko nyaata dabalataa yoom argachuu qabaa jattee yaaddaa?	1. ji`a 4 dura 2. Ji`a 4- 6 3. Ji`a 7- 9 4. Ji`a 10- 12 5. Ji`a 12n boodatii	
2.15	Ji`a meeqatii nyaata dabalataa egale?	Ji`aan	
2.16	Nyaani dabalataan yeroo duraatiif daa`imaaf keenamee maal turee?	1. Annan 2. Marqa 3. shoorbaa 4. kan biraa ----------	
2.17	Ganna kanatti (yeroo ammaa) guyyati yeroo meeqaa daa`imti kee nyaachu qabaa jattee yaaddaa?	1. yeroo 3 gad 2. Yeroo 3-4 3. Yeroo 5-6 4. Yeroo 6 ol.	
2.18	Ganna kanatti (yeroo ammaa) guyyati yeroo meeqaa daa`imti kee nyaachutii jiraa?	1. yeroo 3 gad 2. Yeroo 3-4 3. Yeroo 5-6 4. Yeroo 6 ol.	
2.19	Ganna kanatti (yeroo ammaa),nyaata akkamituu daa`imti kun akka hin nyaanee dhoorkamaa?	1. Foon 2. Alkoolii 3. Buuna 4. Kan biraa	
2.20	Daa`imti kun torbaan lamaan darban keessatti dhukkuba o`ina qaamaa tiin qabamee beekaa?	1. eyyen 2. mitti (gaafii 2.23tii dabrii) 98 = hin beeku	
2.21	Yoo deebin gaafii 2.20 tiif keennamee yoo eyyen ta`e,goorssa ypkiin dawaa dhukkuba o`ina qaamaatiif argatte?	1.Eyeen 2.mitii (gara 2.23tii utaalii)	
2.22	Yoo deebin gaafii 2.21 tiif keennamee yoo eyyen ta`e,goorssa yokiin dawaa dhukkuba o`ina qaamaatiif essarra argatte?	1. Dhaabilee Fayyaa motummaa (Hosp.,HC, Clinic, HP,) 2. Dhaabilee Fayyaa dhunfaa (Hosp.,Clinic,Pharmacy) 3. Hojjatoota Aadaa	

		4. kan biraa---------	
2.23	Daa`imti kun torbaan lamaan darban keessatti dhukkuba qufaa tiin qabamee beekaa?	1.Eyeen 2.mitii (gara 2.27tii utaalii) 98 = Hin beeku	
2.24	Yoo deebin gaafii 2.23 tiif keennamee yoo eyyen ta`e,yeroo qufaan jiru daa`imtii dafee dafee haafura fudhataa?	1.Eyeen 2.mitii 98 = Hin Beeku	
2.25	Yoo deebin gaafii 2.24 tiif keennamee yoo eyyen ta`e, goorssa yokiin dawaa dhukkuba qufaatiif argate?	1.Eyeen 2.mitii (gara 2.27tii utaalii)	
2.26	Yoo deebin gaafii 2.25 tiif keennamee yoo eyyen ta`e, goorsa yokiin dawaa dhukkuba qufaatiif essarra argate?	1. Dhaabilee Fayyaa motummaa (Hosp.,HC, Clinic, HP,) 2. Dhaabilee Fayyaa dhunfaa (Hosp.,Clinic,Pharmacy) 5. Hojjatoota Aadaa 6. kan biraa _____	
2.27	Daa`imti kun torbaan lamaan darban keessatti dhukkuba Garaa kaasaatiin qabamee beekaa?	1.Eyeen 2.mitii (gara 2.31tii utaalii) 98 = Hin beekuu	
2.28	Yoo deebin gaafii 2.27 tiif keennamee eyyen ta`e,yeroo meqaaf issa Garaa kaasee?	1.Yeroo sadii 2.Yeroo Afuriin ol 98 = Hin beeku	
2.29	Yoo deebin gaafii 2.28 tiif keennamee yoo eyyen ta`e, goorssa yokiin dawaa dhukkuba Garaa kaasaatiif argate?	1.Eyeen 2.mitii (gara 2.31tii utaalii)	
2.30	Yoo deebin gaafii 2.29 tiif keennamee yoo eyyen ta`e, goorssa yokiin dawaa dhukkuba Garaa kaasaatiif essarraa argate?	1. Dhaabilee Fayyaa motummaa (Hosp.,HC, Clinic, HP,) 2. Dhaabilee Fayyaa dhunfaa (Hosp.,Clinic,Pharmacy) 3. Hojjatoota Aadaa 4.qoorsa manatii qoophaaye (Bishaan, shukaara, soogida)	
2.31	Daa`imti kee talaalamee beekaa?(kaardii ilaalii)	1.Eyeen 2.mitii (gara 3.39tii utaalii)	
2.32	Yoo deebiin gaafii 2.37tiif eyeen ta`e,talaali goossa kamii fudhate/tte?(tokko filadhu) A) kaardii irraa () B) Gabaassa Haadharraa ()	1. BCG qoofa 2. BCG, DPT1, Polio1 3. BCG, DPT1 – 2, Polio1 – 2 4. BCG, DPT1 – 3, Polio1 – 3 5. BCG, DPT1-3, Polio1-3, Meseales	
2.33	Daa`imtii kee nyaata dabalataa madda biro irraa argatee beekaa?	1. Eyeen 2. mitti (gara gaafii 2.42tii dabrii	
2.34	yoo argatee/ttee essarraa argatee/tte?	1. TFS 2. Safety net 3. WFP 4. MERLIN 5. Kan biro----------	
2.35	Yeroo meeqaaf daa`imti kee nyaata dabalataa kana argatee?	Ji`aan ---------	
2.36	Madaalii Anthropometri?	1ffaa 2ffaa 3ffaa Average Ulfina ---- ----- ------ --------- Dheerina ---- ----- ------ --------	
2.37	Edema ni qabaa?	1. Eyeen 2. Mitii	

kuutaa III: Gaafii Haadhaaf/Guudistuuf qoophaayee:-

Lakk	Gaafii	Deebii	Code
3.1	Ganni kee meeqa turee yeroo duraa futu?	waggaan ----------	
3.2	Yoo daa`ima kee issa duraa deessu ganni kee meeqa turee?	Waggaan ----------	
3.3	Bay`ina ulfaa?	Lakkofsaan ----------	
3.4	Baay`ina ijoolee nagaan dhalatte?:-	Dhiira ---- Dhalaa ----	
3.5	Hundinuu lubuun jirti?	1.Eyeen(gara 3.7tii utaalii) 2.mitii	
3.6	Ijoolen dote yoo jiraatee,sababa isaa ibsi?	Baasaa ---- Qufaa ---- Febrile illness and chills ---- Balaa ----- Sababa biraa ----------	
3.7	Ulfa baastee beektaa?	1.Eyeen 2.mitii (gara 3.9tii utaalii)	
3.8	Yoo baastee jiraatte,yeroo meeqa baastee?	Lakkofsaan ----------	
3.9	Qussanaa maatiti fayadamtee bektaa?	3. Eyeen 4. mitii (gara 3.11tii utaali)	
3.10	Yoo fayadamtee beektaa ta`e, mala issa kam fayyadamte beektaa?	1. Pills 2. Lilmoo 3. Condom 4. kan biraa	
3.11	Hojii dabalataa manaan alatti ni hojjattaa?	1.Eyeen 2.mitii	
3.12	Nyaata bilchesuuf yeroo ga`aa ta`e qabdaa?	1. eyyen 2. mitii	
3.13	Yeroo hundaa yoo daa`imti kee dhukubsatu gara dhaabilee fayyaatii geessitaa?	1. Eyen (gara 3.15tii utaali) 2.mitii	
3.14	Yoo hin geessine ta`ee,essa geessitaan?	----------	
3.15	Haala akkamitin daa`ima ganna shanii gaditiif nyaata qophesitaaf?	1. Nyaata maatii waliin hojjatamaaf 2. Koophaatii hojjatamaaf	