HOUSEHOLD FOOD INSECURITY AND ITS ASSOCIATION WITH NUTRITIONAL STATUS OF CHILDREN 6-59 MONTHS OF AGE IN EAST BADAWACHO WOREDA, HADIYA ZONE, SNNPR.

BY

BEALU BETEBO (BSc)

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BEALU BETEBO (BSc.)

Advisors: -

Dr. FISSAHAYE ALEMSEGED (MD, MPHE, ASSOCIATE PROFESSOR)
Mr. DESSALEGN MASSA (BSc, MPHE)

MAY, 2014

JIMMA, ETHIOPIA

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ABSTRACT

Background: Ethiopia has one of the highest child malnutrition rates in the world. Despite some improvements, approximately half of the children under five are still malnourished. Food insecurity is probably one of the determinant factors of malnutrition in developing countries; however its role remains unclear.

Objective: To assess the prevalence of house hold food insecurity and its association with the nutritional status of children 6-59 months of age in East Badawacho Woreda, SNNPR.

Methods: A community based cross-sectional study was conducted from February20- 30, 2014 on a sample of 508 mother/child pairs of 6-59 month old children. Structured questionnaire was administered to caregivers of the study children. Anthropometric measurement on weight and height was taken from children aged 6-59 months and from their caregivers. Descriptive analysis was used to see the overall distribution of the study subject with the variables under study. Both bivariate and multivariate analysis (binary logistic regression) was used to identify factors associated with nutritional status of children. P value of <0.05 was considered as statistically significant.

Result: the prevalence of household food insecurity was 75.8%. The prevalence rates of stunting, underweight, and wasting among children were 45.6%, 26.3%, and 14.6%, respectively. Household food insecurity was significantly associated with underweight (AOR=3.82; CI=1.78-8.19) and stunting (AOR=6.7; CI=3.71-12.1) but not with wasting. In addition diarrhea (AOR=2.5; CI=1.52-4.13), health status during pregnancy (AOR=2.23; CI=1.27-3.94) and ANC visit (AOR=2.8; CI= 1.66-4.7) come out to be significant risk factors for underweight. Initiation of complementary feeding (AOR=2.41;CI=1.36-4.27) and child age(AOR=2.17;CI=1.11-4.28) were found to be associated with stunting. Also child sex (AOR=1.89; CI=1.01-3.54), diarrhea (AOR=2.28;CI=1.19-4.38), pre-lacteal feeding(AOR=5.28; CI=2.45-11.36),birth interval(AOR=3.44; CI=1.38-8.58) and ANC visit were found to be risk factors for wasting.

Conclusion and recommendation: Household food insecurity and the prevalence rates of stunting, underweight and wasting, among children 6 to 59 months was high and still malnutrition is major public health problem among children in the area. Interventions programs should focus on improving the household food security, on avoiding traditional feeding practices, on the prevention of diarrheal disease and tackle the problem of malnutrition.

ACKNOWLEDGMENT

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ACRONYMS

ANC	Anti Natal Care
ARDO	Agriculture and Rural Development Office
BSc	Bachelor of Science
CI	Confidence Interval
Cm	Centimeter
CTGCO	Culture, Tourism and Government Communication Office
EDHS	Ethiopian Demographic and Health Survey
FANTA	Food And Nutrition Technical Assistant
HAZ	Height for Age Z score
HEW	Health Extension Worker
HFIAS	Household Food Insecurity Access Scale
HHFI	Household Food Insecurity
Kg	Kilogram
MDG	Millennium Development Goals
SD	standard deviation
SNNPR	Southern Nations Nationalities and Peoples Regional State
SPSS	Statistical Package for Social Science
UNICEF	United Nations Children Fund
WAZ	Weight for Age Z score
WCAO	Women and Child Affaires Office
WFP	World Food Program
WHO	World Health Organization
WHZ	Weight for Height Z score

CHAPTER ONE

1. INTRODUCTION

1.1. Background

Nutrition is a cornerstone that affects and defines the health of all people, rich and poor. It is essential for the achievement of full physical and cognitive potential for all individuals and populations and for sustaining health through the aging process. It paves the way for us to grow, develop, work, resist infection and aspire to realization of our fullest potential as individuals and societies. Conversely, malnutrition makes us all more vulnerable to disease and premature death(1,2). It is a devastating problem, particularly for the poor and unprivileged as poverty is a fundamental cause of household food insecurity and consequently malnutrition which continues to be one of the major and most pressing health problems affecting children and (2,3).

Malnutrition literally means "bad nutrition "and technically includes both over- and under-nutrition. In the context of developing countries, under-nutrition is generally the main issue of concern, though industrialization and changes in eating habits have increased the prevalence of over-nutrition. Within the context of World Food Program (WFP), malnutrition refers to under-nutrition unless otherwise specified. WFP defines malnutrition as "a state in which the physical function of an individual is impaired to the point where he or she can no longer maintain adequate bodily performance process such as growth, pregnancy, lactation, physical work and resisting and recovering from disease"(4).

Malnutrition lowers the body's ability to resist infection by undermining the functioning of the main immune response mechanisms. This leads to longer, more severe and more frequent episodes of illness. Hence, Malnutrition is usually the result of a combination of inadequate dietary intake and infection(5). Children are most at risk, because they are more vulnerable to adverse environments and respond rapidly to dietary changes; they are also more at risk of becoming ill which will result in weight loss. Consequently, their nutritional status is considered a good gauge for population-based malnutrition. Children during the developmental years are susceptible to skeletal growth failure in ways that adults are not and are a good reflection of long-term nutritional issues. Therefore, the survey results of the under-5-years population are used to draw conclusions about the situation of the whole population, not just of that age group(4).

In children, malnutrition is synonymous with retarded growth; malnourished children are shorter and lighter than they should be for their age. To get a measure of malnutrition in a population,

young children can be weighed and measured and the results compared to those of a reference population known to have grown well. Under nutrition in children can manifest itself in several ways, and it is most commonly assessed through the measurement of weight and height(5).

Stunting, the anthropometric index height for-age, reflects linear growth achieved pre- and post natally with its deficits indicating long-term, cumulative effects of inadequate nutrition and/or health. Wasting describes a recent and severe process that has produced a substantial weight loss, usually as a consequence of acute shortage of food and/or severe disease. The anthropometric index weight- for- height reflects body weight relative to height. Underweight, The anthropometric index weight for-age, represents body mass relative to age. It is influenced by the height and weight of a child and is thus a composite of stunting and wasting(6).

Multiple and interrelated determinants are involved in why malnutrition develops(7), And Food insecurity is one among the key risk factors. By a widely accepted definition, a household is considered food insecure if it has limited or uncertain physical and economic access to secure sufficient quantities of nutritionally adequate and safe foods in socially acceptable ways to allow household members to sustain active and healthy living(8,9).

Food insecurity comprises three main components: availability, access and utilization, But it mainly depends on access to food, comprising three core domains, namely, anxiety and uncertainty about household food supply, insufficient quality of food, and insufficient food intake by household members ,as distinct from its availability and utilization. In rural areas, household food security may depend on access to land and other agricultural resources to guarantee sufficient domestic production(5,10).

1.2. Statement of the Problem

Worldwide, over 6.7 million children under the age of 5 years die every year from preventable and treatable illnesses despite effective health interventions. More than one third of these deaths are caused by malnutrition(11). MDG-1 is targeted at reducing under-nutrition by half. However, in the developing countries 146 million children under-5 suffer from under-nutrition which is one of the main factors that causes malnutrition(12).

In Africa, malnutrition continues to contribute to half of annual child deaths and is a leading cause of diseases and disabilities in children(13). In Sub-Saharan Africa, four million children die from preventable diseases annually of which 60% is as a result of malnutrition(14).

In Ethiopia, one of the world's poorest countries with low levels of development, many people live in conditions of chronic hunger with a low average daily energy supply(15). The country also faces serious and growing food insecurity problem, affecting as much as 45% of the population(16). Malnutrition in children is one of the most serious public health problems in Ethiopia and the highest in the world(17) .The country has the second highest rate of malnutrition in Sub-Saharan Africa(18) and with high under five mortality rate (88/1000 live births) which is mainly due to infection and malnutrition(19).

According to 2011 Ethiopian DHS 44.4%, 9.7% and 28.7% of children under five years of age are stunted, wasted and underweight respectively. Similarly, In SNNPR prevalence of child malnutrition indicates that 44.1, 7.6%, 28.3% of children are stunted, wasted and underweight respectively(19).

The issue of child malnutrition is critical because its effects are not limited to the boundary of childhood but rather persist into adulthood. It silently destroys the future productivity of nations, and increases the economic burden of a society because it leads to increased risk of death from infectious diseases(6,20).

Malnourished children have lowered resistance to infection; therefore, they are more likely to die from common childhood ailments such as diarrheal diseases and respiratory infections. In addition, malnourished children that survive are likely to suffer from frequent illness, which adversely affects their nutritional status and locks them into a vicious cycle of recurring sickness, faltering growth and diminished learning ability(21).

Malnutrition is a complex phenomenon that stems from various underlying determinants, including a lack of optimal feeding practices for infants and young children. In UNICEF's conceptual framework for determinants of nutritional status, household food insecurity and maternal and child care practices have been given due attention in addition to, access to health services and a clean environment(22).

Food insecurity is defined as lack of sustainable access to enough safe, nutritious, and socially-acceptable food(23). It is a common phenomenon among the poor households and has been shown to contribute to poor health and nutritional outcomes. Household food insecurity can potentially worsen nutritional status of household members, by negatively affecting food consumption, either through reduced dietary variety or nutrient intake of food. In the household with sever food insecurity children experience reduced food intake and hunger, which will later result in malnutrition since malnutrition is usually the result of a combination of inadequate dietary intake and infection(5,24). Food insecurity may also affect nutritional status through its effects on stress, depression, parenting, and infant feeding. However, the relationship between household food insecurity and nutritional status of children, particularly in developing countries, is not well established(25).

Even though various studies have been conducted on nutritional status of children, the effect of household food insecurity has not been examined. Also there is no study conducted on household food insecurity and nutritional status of children in East Badawacho Woreda. So that, the present study aims to assess the prevalence of household food insecurity and malnutrition among children aged 6 to 59 months, as well as the association between these two factors.

CHAPTER TWO

2. LITRATURE REVIEW

The potential intellectual and technical capacity of a population depends on good nutrition, particularly for young children (26). Nutritional status of children is influenced by three broad factors: food, health and care. Optimal nutritional status results when children have access to affordable, diverse, nutrient-rich food; appropriate maternal and child-care practices; adequate health services; and a healthy environment including safe water, sanitation and good hygiene practices (12). Moreover, food security at the national and household levels is also an essential prerequisite. These factors directly influence nutrient intake and the presence of disease. The interaction between under nutrition and infection creates a potentially lethal cycle of worsening illness and deteriorating nutritional status (5,26).

2.1. Prevalence of household Food Insecurity

A household is considered food insecure if it has limited or uncertain physical and economic access to secure sufficient quantities of nutritionally adequate and safe foods in socially acceptable ways to allow household members to sustain active and healthy living. Study conducted in Nepal based on the answers to five questions that were used as a proxy for the full HFIAS tool showed more than 69.2% experienced some degree of food insecurity in the 12 months preceding the survey. More than half of the households experienced worry or anxiety about food supply, and a little over 60% of mothers reported they could not feed their children nutritious animal-source foods such as eggs and meat because of lack of money for purchasing these foods. Approximately one in every five households ran out of food stores, and a similar proportion had a household member who ate less than usual at some point in time during the 12 months before the survey(27).

The study conducted in Sidama, Southern Ethiopia, Using the HFIAS measure revealed that about 54.1% of the households in the study area are found to be food insecure, and 28.8% of the households fall in mild to severe level of household hunger for an extended period of time during a year. 55.9 percent of the respondents reported to have worried about food shortage during the last four weeks; 73.1 percent reported inability to eat the preferred food: 74.3 percent reported to have eaten limited variety of food; 28 percent were unable to eat the preferred variety of food due to lack of adequate resources; 67.4 percent reported that their

household members eaten smaller amount of food; 62.9 percent missed the number of meals per day; 29.8 percent experienced ever no food to eat; 19.1 percent reported sleeping without eating food , and 12.5 percent reported to have spent the day and night without eating any food(28). However this study didn't show the consequences of food insecurity on the nutritional status of children.

Similarly studies conducted in Ethiopia, wolayita and oromia zones shows that 74.2 % and 73.1% of households face food insecurity respectively(28,29). Also the study conducted in hadiya zone shone district shows that almost all the respondents (98.5%) were worried that the food runs out before they get money and (56.4%) worried always. (94.4%) of respondents also cuts the size of food and eating less than they felt, and (30.5%) adults were not eating the whole day(31). Though this study assessed the household food insecurity, the effect of household food insecurity on the nutritional status of children has not been examined.

2.2. Nutritional status of children

Child malnutrition continues to be a major public health problem in developing countries. Nutritional status is primarily determined by a child's growth in height and weight and is directly influenced by food intake and the occurrence of infections. Stunting (chronic malnutrition), wasting (acute malnutrition), and underweight (a general measure of health and nutritional status) are assessed at the population level(32). In Ethiopia, 44%, 10% and 29% of children under five years of age are stunted, wasted and underweight, respectively(19).

The community based cross sectional quantitative study conducted in Dollo Ado district, Somali region revealed that the overall prevalence of malnutrition in the community was high with 42.3% of the children being wasted, 34.4% for stunting and 47.7% for underweight(33). Similarly the cross sectional study conducted in Abote Hidabu district, Oromia region showed that, 47.6%, 30.9% and 16.7% of children were stunted, underweight and wasted, respectively(34). Also another cross sectional survey which was conducted in rural communities from 4 zones of Tigray, Northern Ethiopia indicated that the levels of stunting, underweight and wasting were 42.7%, 38.3% and 13.4% respectively(35).

2.3. Household food insecurity and nutritional status of children

Hence, food insecurity is defined as lack of sustainable access to enough safe, nutritious, and socially-acceptable food. It is a major factor contributing to hunger and malnutrition. A study

which is conducted in tamale Ghana showed that, Compared to food secure households, children from food insecure households had lower mean HAZ. The nutritional status of young children (6–23 months) was less sensitive to changes in food access compared to other age groups (≥23 months). In other words, the relationship between food insecurity and chronic under-nutrition was stronger among children aged at least 23 months. Compared to children in food insecure households, children in secure households were 46% protected from chronic malnutrition(36).

Similarly, a cross sectional survey conducted in Nepal revealed that the mean HAZ and WAZ were lower for children from food-insecure households than for children from food-secure households. However, the mean WHZ was similar between the two groups. The prevalence rates of stunting and underweight were slightly higher among children from food-insecure than among children from food-secure households. However, only the difference in prevalence of stunting approached significance(27).

Another study which is conducted iife-nigeria revealed that Household food security status was significantly associated with children's nutritional status. .Children who skipped or reduced meals because of insufficient finances were significantly more likely to be wasted than those who did not and four times more likely to be underweight than the children who ate regularly. Households that were food insecure were five times more likely than the households that were food secure to have wasted children(37). another cross sectional study which was conducted in Brazil (38) showed that WHZ mean value was lower for children who lived in moderate to severe food insecurity compared with food secure households.

A surveys conducted in Ethiopia, Bangladesh and Vietnam to examines the association between household food insecurity (HFI) and child under nutrition revealed that approximately one quarter of households in Bangladesh and Vietnam and nearly half of households in Ethiopia were moderately to severely food-insecure. Household food insecurity was significantly associated with stunting and underweight in all three countries(39). However, their sample was selected from different parts of the country so that this cannot represent the situation of specific areas.

2.4. Other factors associated with nutritional status of children

Child characteristics

Age of the child:

Children's nutritional status is also more sensitive to factors such as feeding practices, care, and exposure to infection at specific age's **.**Multiple studies have identified that nutritional status of children is differs in specific ages(40,41,42). study conducted in Vietnam revealed that The highest proportion of underweight children (44.3%) was observed in children between the ages of 36 and 47 months and the highest proportion of stunting (57.3%) was observed in children between the ages of 12-23 months, while the highest proportion of wasting (17.0%) was observed in children that were 48 and above months old(43).Another study conducted in Tigray showed that child malnutrition increased with age(35).

Sex of the child:

A number of studies in Ethiopia and other developing countries suggest that malnutrition among boys is consistently higher than malnutrition among girls. The study conducted in West Gojam zone showed that a higher percentage (47.8%) of male children was stunted compared to 38.7 percent of female children(44). Similarly study conducted in Somali region Ethiopia revealed the odds ratio of being underweight, stunting and wasting was lower among female children than among male children. But the study conducted in Allahabad revealed that the prevalence of stunting was more among females (63.3%) than that for males (44.9%)(45).

Birth weight:

Low-birth weight babies are at greater risk of dying than infants of average weight. If they survive, they will have more episodes of illness and they are also more likely to become malnourished. According to the study conducted in India, 88.98% children with low birth weight were malnourished. Significant association was observed between birth weight, & malnutrition(46). Also the study which is conducted in Bangladesh indicated that Babies who were larger in size at birth had lower risk of malnutrition than those who were very small in size at birth(47).

Morbidity status:

A community based crass sectional study conducted in West Gojam revealed that among health related variables included in the analysis, only incidence of diarrhea with two weeks prior to the study showed a significant association with child stunting. Although, the prevalence of stunting was slightly higher among those who had malaria in the two weeks before the survey,

the association was not statistically significant(44). The study conducted in Nghean, Vietnam also showed that the risk of being underweight was 2.3 times higher for children who had experienced diarrhea in the last 2 weeks than in children who had not(43).

Maternal characteristics

Education of mother:

Various studies have concluded that parental education especially that of mothers is a key element in improving children's nutritional status **.**The study conducted in Tanzania showed that Children from the mothers who did not receive formal education were more likely to be undernourished than the educated mothers. More than 40% of the mothers with no formal education had undernourished children compared to none of those who had received secondary school education(48). Also the study conducted in Somali region Ethiopia revealed the risk of malnutrition is lower for children of mothers attended formal education compared to those children whose mothers had no formal education(33).

Child caring practice

Feeding practice:

Infant and child feeding practices are major determinants of the risks of malnutrition. Study conducted in Allahabad on the effect of feeding practice on nutritional status of children revealed that Children who were fed colostrum (27.5%), and got proper complementary feeding (28.6%) were found to be significantly less as compared to proportions of underweight among their respective counterparts. Late initiation of breast-feeding beyond six hours and deprivation from colostrum came out to be significant risk factors of stunting. Stunting among children who were fed colostrum (42.1%) was significantly less than that among those who were not fed colostrum (59.0%)(45).

Most of the studies reviewed above have identified different factors determining the nutritional status of children, but they missed to examine the household food insecurity as a factor. Though some studies have identified household food insecurity as a determining factor for nutritional status of children, their target population and age group is different from the present study. There is no study which is conducted on assessment of household food insecurity and nutritional status of children 6-59 months of age, as well as the association between them in East Badawacho Woreda

2.5. Conceptual frame work of the study

The present study aims to assess the household food insecurity and its association with nutritional status of children. So that, the conceptual framework is adapted from UNICEF's conceptual frame work on determinants of nutritional status of children 1997. The main independent variables is household food insecurity, with other independent variables categorized as household characters, child characters, maternal characters, child caring practice and environmental factors and the dependent variable is nutritional status of children.

As shown from *figure 1* **household food insecurity** affects the nutritional status of children. Since, HHFI refers to limited access to nutritionally adequate and safe food. Children living in this households will have inadequate (insufficient quality and Quantity) dietary intake. Consequently, these households will have poor **child caring (feeding) practice** which leads to malnutrition.

A household character: Hence, HHs with farmland and occupations will possibly have their own income, So that they are less likely to be **food insecure** and will have good child caring practice, which may in turn have a positive effect on the nutritional status of the child. Similarly, more educated mother is likely to have a higher income (which can directly affect her children's health and nutrition) and higher status and power in the household putting her in a better position to make decisions about her, ANC visits, birth intervals, children's needs etc.

A maternal character refers to demographic, socioeconomic as well as biological factors of the mother. Health and nutritional status during pregnancy has effect on nutritional status of the child directly or through child's character. Since, mothers who are Malnourished and with small BMI are at great risk of bearing small birth weight baby, which makes the child prone to recurrent sickness which leads to faltered growth.

Child characters: like age, sex, birth weight, morbidity status, birth interval and birth order of the child have association with nutritional status of the child. Diarrhea and other infectious diseases manifested in the form of fever may have a negative effect on improved child nutritional status. Higher birth spacing is likely to improve child nutrition, since the mother gets enough time for proper childcare and feeding.

Environmental factors: Due to their impact on diarrheal diseases, clean water and sanitation play a particularly important role in child nutrition. Unfavorable environment caused by inadequate water and sanitation can increase the probability of infectious diseases and indirectly cause malnutrition.
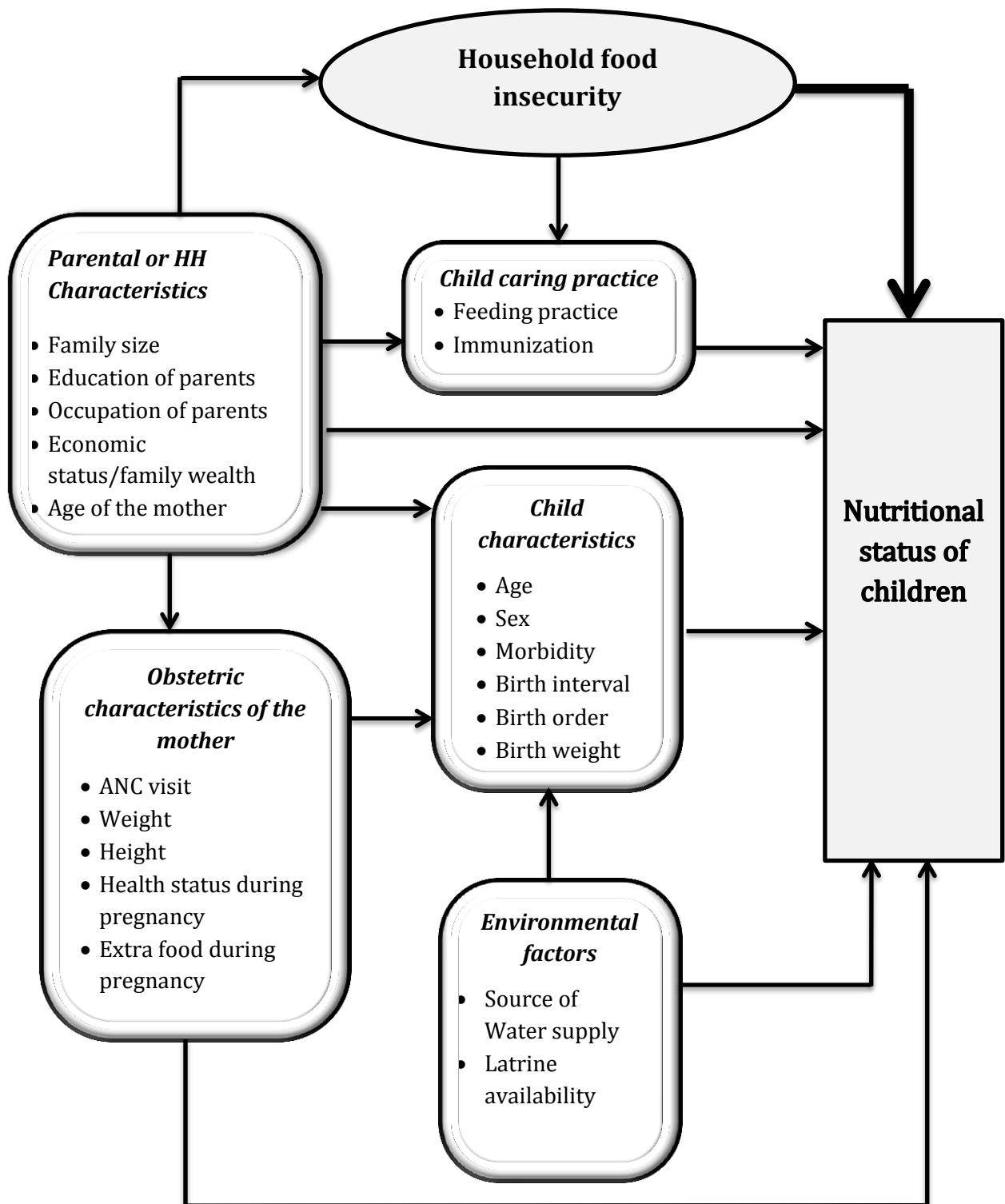
Figure 1:- Conceptual framework of the study, Adapted from UNICEF, 1997

2.6. Significance of the study

Nutritional status and food security are a priority as malnutrition is a risk factor for morbidity and mortality, poor cognitive development and reduced productivity. HH Food insecurity is probably one of causes of malnutrition in developing countries, but its role remains unclear. In particular, it is not known whether all children suffer from household food insecurity will be affected by malnutrition and at what extreme levels. Many studies have been conducted on determinant factors of children nutritional status, however the studies which have identified household food insecurity as factor are limited, in addition their target population and study area is different from the present study.

HHFI and childhood malnutrition is highly prevalent in SNNPR, particularly in the study area; however there is no a single study conducted on the association between food security and nutritional status of children. Accordingly, this study assesses the prevalence of household food insecurity and nutritional status of children, as well as the association between these two factors in the study area. The information that will be obtained from this study will help to indicate the actual burden of malnutrition pertaining in the study area and will form baseline data for further researchers and local health planners to critically look at the problem during their planning process. Besides, by the examining the level of household food insecurity an effective intervention program will also be drawn.

Furthermore, this study will also help to fulfill the gap that exists in the literature and provide locally applicable evidence based information to a wide range of stakeholders including policy makers, program planners, health care providers, community leaders, and community members, So as to monitor the situation and take appropriate intervention in future to combat and prevent malnutrition in the community.

CHAPTER THREE

3. OBJECTIVES

3.1. General objective

To assess the prevalence of household food insecurity and its association with the nutritional status of children 6-59 months of age .

3.2. Specific objectives

1. To measure the prevalence of household food insecurity in the study area.
2. To assess the prevalence of nutritional status of children 6-59 months of age.
3. To determine the independent association of household food insecurity with nutritional status of children 6-59 months of age.
4. To identify other factors associated with nutritional status of children 6-59 months of age.

CHAPTER FOUR

4. METHODS AND MATERIALS

4.1. Study area and period

This study was conducted in East Badawacho Woreda, from March 10- 30, 2014. The Woreda is one of ten administrative Woredas found in Hadiya Zone of the Southern Nations Nationalities and Peoples region (SNNPR). It is located approximately at 7^0 north latitude and 37 to 38^0 East longitudes. It is bounded by Alaba special Woreda in the north, Siraro Woreda of Oromia region in the east, Kedida Gamela and West Badawacho Woreda in the west, Damot Woyide, Damot Gale, and Damot Fulasa Woreda of Wolayita Zone in the South. The capital of the Woreda, Shone, is located at a distance of 345 km in the south-west from Addis Ababa and 123 km from Hawassa, the capital of the region, and 97 km from Hosanna.

Based on population projection 2007 in to 2013/14, the population of East Badawacho Woreda is estimated to be 210,389 from which male accounts 104,563 while female are 105,826.Area of the Woreda is 439.96 square kilometers with a population density of 463.1 people per square kilometers. The Woreda has thirty nine rural kebeles. About 50.26 percent of total inhabitants in the Woreda reside in wet Midland while 49.74% of Woreda population resides in the dry mid land agro-ecology. Its annual rain fall amount ranges from 800 mm to 1300mm. The soil type is dominated by brown sandy silt and highly susceptible for erosion.

The woreda has 8 health centers, 39 health posts and 23 private clinics. There is 1 preparatory, 5 high schools and 44 junior and 8 primary schools. Also electricity, telecommunication, radio and television services are available. The majority of the population economy depends on traditional agriculture, the main crop produced in the area is maize, and teff in small amount. The agricultural productions are collected during Meher (Jun-August) seasons. Most of the households face shortage of food during belg (February - May) seasons, 3-4 months prior to the harvesting period. During this season, household's food reserve from the previous year gets smaller and the market price of the crops will also increase.

4.2. Study design

Community based cross sectional study design was employed using quantitative approach.

4.3. Population

4.3.1. Source population

The source population was all children in the age group 6-59 months and their caregivers who live in East Badawacho Woreda.

4.3.2. Study population

The study population was all children in the age group 6-59 months and their caregivers who live in the selected households during the study period.

4.4. Eligibility criteria

4.4.1. Inclusion criteria

Children whose age were 6-59 months and was permanent residents in the study area and stayed for more than three months on the area was used as inclusion criteria for this study.

4.4.2. Exclusion criteria

Seriously ill children were excluded as they were referred immediately to the nearby health facilities for further help.

Care giver with mental illness who cannot respond appropriately and with other severe physical conditions which interferes the interview was excluded from the study.

4.5. Sample size determination and sampling procedure

4.5.1. Sample size determination

To determine the children to be included in the study different proportions were identified in order to get a larger sample size.

Based on the 2011 EDHS report the prevalence of stunting, underweight and wasting in SNNPR is 44.1%, 28.3% and 7.6% respectively(19). And the study conducted in 2012 in Wolayita, SNNPR showed that 74.2% households face food insecurity(29). And also another similar study which is conducted in iie-ife, Nigeria revealed that the proportion of underweight in food secure and insecure household was 8.3% and 17.2% respectively (37).

So the sample size was determined using Epi Info version 7 based on the following assumption.

Expected prevalence: the prevalence which gives larger sample size was taken i.e. proportion of underweight in food insecure household p_1= (17.2%) and proportion of underweight in food secure households p_2= (8.3%) iie-ife, Nigeria.

Confidence level (C.I) = 95%, which means α set at 0.05 and $Z_{\alpha/2}$ = 1.96 (value of Z at α 0.05 or critical value for normal distribution at 95% C.I.). And **power** of 80%.

As the main aim of the study was to compare the nutritional status of children between food secure and food insecure households, a two population proportions formula was used to determine the sample size.

$$ n = \frac{\left(Z_{1-\alpha/2} + Z_{1-\beta}\right)^2 \{P_1(1-P) + P_2\,(1-P_1)\}}{(P_1 - P_2)^2} $$

Then the number of children that are included in the study was 484(242*2) and by adding a 5% of the sample for non-response rate, the final sample size was 508 children/caregiver pairs.

4.5.2. Sampling technique/procedure

There are 39 kebeles (smallest administrative units), 8 catchments, in east badawacho woreda. To generate a sampling frame for each kebele, households with children 6-59 months of age were identified in each kebeles, from HEW's family folder. The calculated sample (508) was proportionally allocated to all Kebeles. Sample households with eligible children were selected from the sampling frame of each kebele using simple random sampling technique. When there was more than one child present in the selected household, only the youngest child was selected.

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┌─────────────────────────────────────────────────────────────────────────────┐
│      EAST BADAWACHO WOREDA /8 CATCHMENTS/32,821 HHs with eligible children    │
└─────────────────────────────────────────────────────────────────────────────┘

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│ Shone  │ │ Ambrse │ │ Korga  │ │  Edo   │ │ Chefa  │ │ Ajeba  │ │ jarso  │ │ Hanich │
│ (6255) │ │ (3512) │ │ (3103) │ │ (4568) │ │ (3337) │ │ (3029) │ │ (4295) │ │ (4722) │
└────────┘ └────────┘ └────────┘ └────────┘ └────────┘ └────────┘ └────────┘ └────────┘

PAS                                                                              PAS

   97         54         48         71         52         47         66         73

                          SIMPLE RANDOM SAMPLING

                                508
                          Children / caregiver
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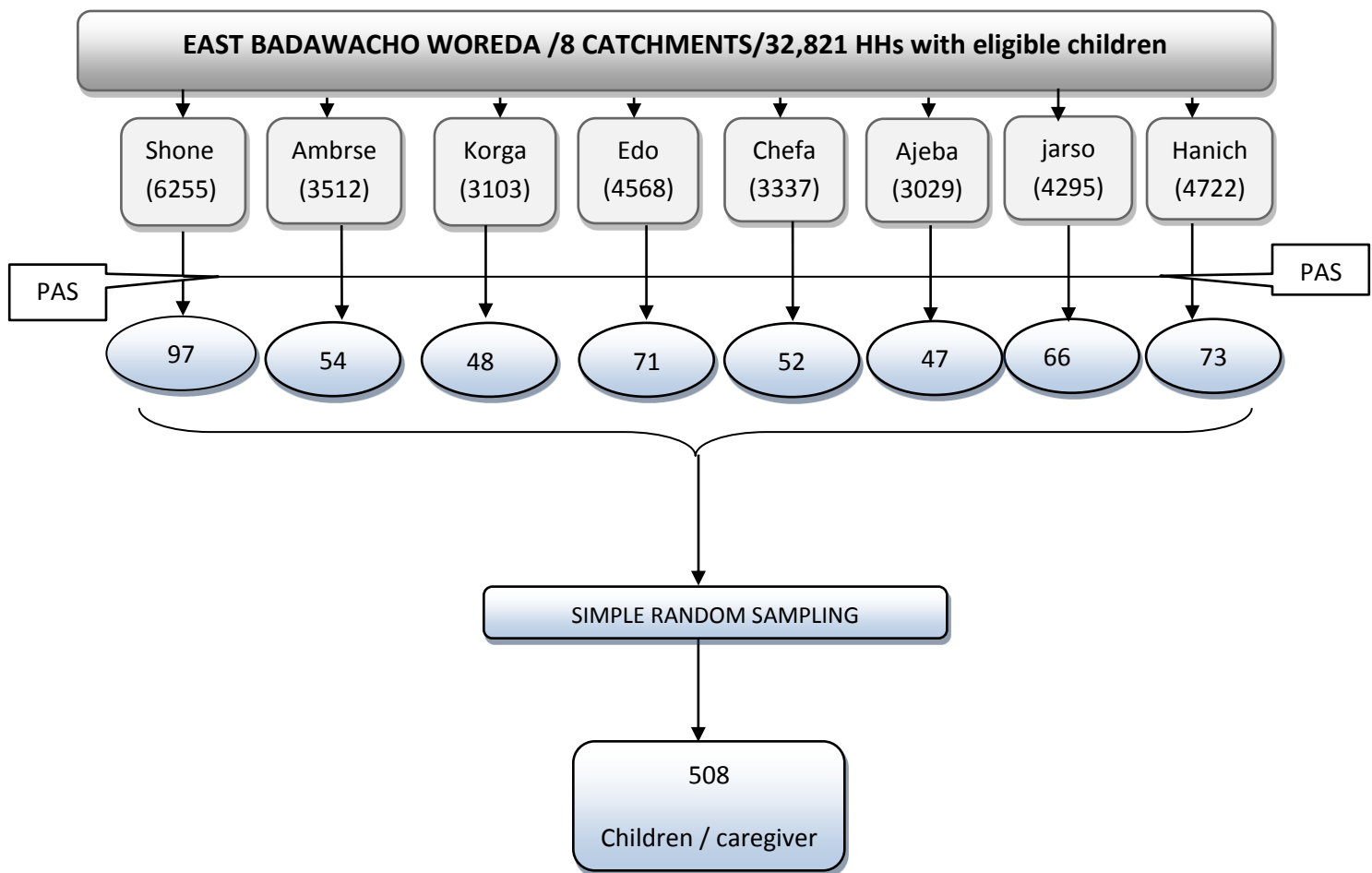
Figure 2:- schematic representation of sampling procedure

4.6. Data collection instrument and procedure

4.6.1. Data collection instrument

Structured and uniform questionnaire comprising of seven parts, **part I: characteristics of the household** such as head of household, family size, maternal education status, paternal educational status, occupational status and economic status consisting 11 items. **Part II: maternal characteristics** like maternal age, number of children ever born and ANC visits which consists 10 items. **Part III: child characteristics** such as child age, sex, birth weight, birth interval, morbidity and vaccination status of the child which consists of 22 items. **Part IV: child caring practices** consisting 14 items which are related to early initiation of breast feeding, exclusive breast feeding and complementary feeding practices. **Part V: Household Food Insecurity Access Scale (HFIAS)** Measurement Tool which consist 9 items developed by the Food and Nutrition Technical Assistance (FANTA) project. And **part VI: environmental factors** consisting of 7 items like availability of latrine and source of water supply was administered to the care giver of the study children.

Anthropometric measurement on weight and height was taken from children aged 6-59 months. Height of the child was measured using measuring board with an upright wooden base and a movable head piece. Their weight was measured using Salter spring scale. Height and weight of the care givers was measured using stadio meter and electronic digital weighing scale.

4.6.2. Study variables

4.6.2.1.Dependent variables

Nutritional status (stunting, underweight, wasting) of children.

4.6.2.2.Independent variables

❖ **Household food insecurity**

❖ Other independent variables

Child characteristics

- age
- Sex
- birth order
- birth interval
- Morbidity
- Birth weight/size at birth

obstetric characteristics of the mother

- ANC visit
- Weight
- Height
- Health status during pregnancy
- Extra food during pregnancy
- Children ever born

parental characteristics

- Family size
- Education of parents
- Occupation of parents
- Economic status/wealth index Age
- Age of the mother

Child caring practice

- Immunization status
- Feeding practice

Environmental health factors

- Source of water supply
- latrine availability

4.6.3. Data collection procedure

Data was collected using a pre-tested structured questionnaire. A face to face interview was made with the Caregivers of the child. Date of birth of the children, in most cases was established relying on the date given by the caregiver. For those with written evidence, date of birth was obtained from clinic cards or child health cards. Data validity and reliability was maintained through close supervision of enumerators by the principal investigator.

Anthropometry: Length of infants aged 6-23 months was measured in a recumbent position to the nearest 0.1 cm. Height of children 24 months and older was measured in a standing-up position to the nearest 0.1cm. Weight of the lightly clothed infants and children was measured to the nearest 10 g. Weight and height of the caregivers was also measured to the nearest 0.1kg and 0.1 cm respectively.

4.6.4. Data collectors

Ten data collectors with diploma in clinical nursing and 3 supervisors with degree in clinical nursing or health officer who are able to communicate in Amharic and hadiyisa and had been involved in other similar field surveys was recruited.

4.7. Data processing and analysis

After the completion of data collection, the data was checked for completeness and consistency. To be edited and cleaned the collected data was entered into Epi-Data 3.1 and Exported into SPSS version-16 statistical software for analysis. WHO anthro version 3.0.1, 2007 software was used to convert the anthropometric data into Z-scores of the indices, HAZ, WHZ and WAZ.

Descriptive analysis such as mean, SD, frequency and percentage was used to see the overall distribution of the study subject with the variables under study. Bivariate analysis (binary logistic regression) was carried out to select variables for multivariable model. Multivariable logistic regression analysis was carried out to identify the most important predictors of nutritional status of children 6-59 months of age controlling the effects of confounding variables. And P value of 0.05 was taken as cut off point to label the significance of the variables. The strength of association was measured by 95% confidence interval (crude /adjusted odd ratio). Those variables with p value ≤ 0.2 in the bivariate analysis was inputs for multivariable logistic regression analysis and also multicolinearity between independent

variables was checked, then final model was constructed using enter logistic regression method. All models are checked for their fitness using hosmer and lemeshow goodness of fit test.

4.8. Data quality management

To assure the quality of data, the questionnaire was developed in English and are interviewer administered and was translated to the local languages (Amharic and hadiyisa) then their consistency was checked by another person who speaks both languages. The questionnaire was back translated to English to check for its conceptual equivalence. And variables incorporated in the questionnaire were adapted from different instruments that were used for the assessment of similar studies (19, 31, 33-43).

For effective and quality data collection, a two day intensive training was given to the selected data collectors by the principal investigator. The training covered study objectives, a thorough review of the questionnaire, the use of survey instruments, interview techniques, directions how to administer the structured questionnaire, how to take anthropometric measurements and ethics during field work in line with predesigned training module.

Prior to the actual data collection, the questionnaire was pre-tested using 5% of the sample from a similar population who were not included in the main study. The questionnaire was modified based on the pretest result accordingly.

Measurement was taken using UNICEF's standard instruments of weighing scale and height board and was routinely checked and adjusted to maintain its accuracy. Calibration of the indicator against zero reading was checked following weighting every child. Age of the child could be under or overestimated, because caregivers were the only source for the age of the child. But to reduce recall bias prominent local events was used. The same was true for other similar variables.

Supervisors and investigator kept track of the field procedures and checked the completed questionnaires every day to ensure accuracy of the data collected. Error was returned to the data collectors so as to revisit the households. And those children who were found seriously sick during the data collection process were referred to the nearby health facilities for further help.

4.9. Ethical consideration

Letter of ethical clearance was obtained from ethical review committee of Jimma University College of Public Health and Medical Sciences. Permission from East Badawacho Woreda administrative officials, Woreda health office as well as from kebele administrators was obtained through formal letters which was taken from Jimma University.

Informed consent was obtained from study participant. All the interviews was made with strict privacy after getting informed consent from the respondents by assuring the confidentiality of the responses. Thus, name and address of the interviewees was not recorded in the questionnaire. They were also informed that, they have full right to discontinue or refuse to participate in the study. For this purpose, a one-page consent letter was attached to the cover-page of each questionnaire stating about the general purpose of the study and issues of confidentiality which was discussed by data collectors before proceeding with the interview.

4.10. Dissemination plan

The result of this study will be presented to Jimma University. Also it will be disseminated to Hadiya Zone health department and East Badawacho Woreda health office as well as for the respective health institutions. Attempts will be made to publish the finding in peer-reviewed journals and present it in scientific conference.

4.11. Operational definition

Stunting: the percentage of children aged 6 to 59 months whose height for age is below minus two standard deviations from the median of the WHO Child Growth Standards.

Severe stunting: the percentage of children aged 6 to 59 months whose height for age is below minus three standard deviations from the median of the WHO Child Growth Standards.

Wasting: the percentage of children aged 6 to 59 months whose weight for height is below minus two standard deviations from the median of the WHO Child Growth Standards.

Severe wasting: weight for height below minus three standard deviations from the median weight for height of the WHO Child Growth Standards.

Underweight: the percentage of children aged 6 to 59 months whose weight for age is below minus two standard deviations from the median of the WHO Child Growth Standards.

Severe underweight: children aged 6 to 59 months whose weight for age is below minus three standard deviations from the median of the WHO Child Growth Standards.

Household food insecurity: In this analysis, household food insecurity was assessed using the Household Food Insecurity Access Scale (HFIAS) developed by the Food and Nutrition Technical Assistance (FANTA) project. The HFIAS tool consists of nine questions that are believed to capture all three core domains that reflect a household's inadequate access to food. Each question has four response options—never, rarely, sometimes, or often—which was coded in order of increasing frequency from 1 to 4. A household was classified as food insecure if the family reported experiencing any of the nine conditions within the recall period (i.e., if the answer to any of the questions is "rarely," "sometimes," or "often"). All households that did not meet this condition was classified as food secure. The only exception was among households in which the respondent's answer to question 1 was "rarely" but the response to all the other questions was "never." Such households was also considered food secure(49).

Low birth weight: an infant weighing less than 2,500 grams at birth.

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

Diarrhea: A child with loose stools for three or more times per day.

Serious illness: diseases other than diarrhea and respiratory diseases.

Catchment area: Groups of nearby kebeles which are served at 1 health center, and are usually 5 in number but rarely they can be 4 or 6 based on their population size.

Wealth Index- is a composite measure of the cumulative living standard of a household. The wealth index is calculated using easy-to-collect data on a household's ownership of selected assets, such as television, radio, livestock and farm land. Generated with a statistical procedure known as principal components analysis, the wealth index places individual households on a continuous scale of relative wealth. Each household asset for which information is collected is assigned a weight or factor score generated through principal components analysis. The resulting asset scores are standardized in relation to a standard normal distribution with a mean zero and a standard deviation of one. These standardized scores are then used to create the break points that define wealth index as very poor, poor, middle, rich and very rich.

CHAPTER FIVE

5. RESULT

5.1. Demographic and socio-economic characteristics of parents

A total of 508 households, having at least one child aged 6-59 months, were included in the survey from 39 kebeles of East Badawacho Woreda, Hadiya zone, South Ethiopia. Data for 12 children were incomplete; thus final analysis was based on 496 mother-child pairs with response rate of 97.6%.

The mean age of the mother was 30 years (SD of 4.8) and the majority 355(71.6%) of the mothers are in the age group of 25-34. Among the respondents, 447(90.1%) of the households were male headed. Majority of respondents accounting for 348 (70.2%) were Hadiya ethnic group and 367 (74.0%) were protestants and 59(11.9%) were orthodox. The mean family size was 6.7 with SD of 2. Out of the respondents 147 (29.6%) had less than five family size. Among the households 262(52.8%) of them had more than 2 under five years children.

The distribution on educational status of the respondents indicates that 217(43.8%) of mothers had no education and 203(40.9%) were completed primary education and majority 411(82.9%) of them were housewives. Two hundred forty four (49.3%) of fathers were completed primary education and 263(53%) of them were farmers. Regarding family wealth 20% and 20.4% of the households were very poor and poor respectively (*Table 1*).

Table 1:- Demographic and socio-economic characteristics of parents at East Badawacho, SNNPR, March 2014

Variable	Category	Frequency	Percent
Head of the household	Female	49	9.9
	Male	447	90.1
	Total	496	100.0
mother age	<24	50	10.1
	25-34	355	71.6
	>35	91	18.3
	Total	496	100.0
Educational level of mother	No education	217	43.8
	primary	203	40.9
	Secondary and above	76	15.3
	Total	496	100.0
Educational level of father	No education	123	24.8
	primary	244	49.3

Table 1: continued…

	Secondary and above	128	25.9
	Total	495	100.0
Occupation of mother	house wife	411	82.9
	Farmer	14	2.8
	merchant	33	6.7
	private org employee	4	0.8
	Govn't employee	22	4.4
	daily laborer	12	2.4
	Total	496	100.0
Occupation of father	Farmer	263	58.8
	daily worker	50	11.2
	merchant	17	3.8
	private org employee	41	9.2
	Govn't employee	76	17.0
	Total	447	100.0
Ethnicity	Hadiya	348	70.2
	Kembata	53	10.7
	wolayita	53	10.7
	Halaba	35	7.1
	Other*	7	1.4
	Total	496	100
Religion	protestant	367	74.0
	orthodox	59	11.9
	Muslim	39	7.9
	Catholic	31	6.3
	Total	496	100.0
no of under five children	1 child	234	47.2
	2 child	214	43.1
	>3 child	48	9.7
	Total	496	100.0
family size	≤5	147	29.6
	>6	349	70.4
	Total	496	100
Wealth index	Very poor	98	20.0
	Poor	100	20.4
	Middle	96	19.6
	Rich	99	20.2
	Very rich	98	20.0

*other= Amara (3), Oromo (2), Tigre (2)

5.2. Obstetric characteristics of the mother

Regarding obstetric character of mothers, majority of the mothers accounting for 446(89.9%) are married. And their average age at marriage was 19.6(SD of 2.6). Average children born to a mother was 4.1(SD of 2) and 198(39.9%) of mothers gave birth for more than 5 children and 349(70.4%) of them visited ANC service when they had the index child.

The health status of 410(82.7%) mothers was good during their pregnancy and 346(69.8%) of the mothers have not consumed extra food during the pregnancy of the index child (*table 2*).

Table 2:- obstetric characteristics of the mothers in East Badawacho, SNNPR, March 2014.

Variable	category	Frequency	Percent
Age at marriage	≤19	227	45.8
	>20	269	54.2
	Total	496	100.0
Children ever born	≤4	298	60.1
	>5	198	39.9
	Total	496	100.0
Marital status	single	2	0.4
	married	446	89.9
	divorced	25	5.0
	widowed	23	4.6
	Total	496	100.0
extra food during pregnancy	yes	150	30.2
	no	346	69.8
	Total	496	100.0
Health status during the pregnancy	good	410	82.7
	sick	86	17.3
	Total	496	100.0
	Total	496	100.0
ANC visit	yes	349	70.4
	no	147	29.6
	Total	496	100.0

5.3. Demographic and health related characteristics of the child

From the total children included in the survey 245(49.4%) were male and the mean age of the children was 26.4 months with SD of 13.2. Age interval between the index and the previous child was 2 for 221(49.4%) of children and was greater than 3 for 150(33.6%) of children and the birth order for 118(23.8%) of the children was greater than six (table *3*).

Place of delivery for 413(83.3%) of the children is at home and 372(75.0%) of the deliveries were attended by TBA. For 234(47.2%) of the children their size at birth was on average and 85(17.1%) had small size during birth.

From the total children 331(66.7%) had diarrhea, 171(34.5%) had fever, and 66(13.3%) had other serious illness two weeks prior to the survey and 21(4.2%) had measles 6 month prior to the survey (*Table 3*).

*Table 3:-*Demographic and health related Characteristics of children age 6-59 months in east Badawacho Woreda, SNNPR, March 2014.

Variables	category	Frequency	Percent
Child's sex	male	245	49.4
	female	251	50.6
	Total	496	100.0
Child age	6-11	67	13.5
	12-23	131	26.4
	24-35	142	28.6
	36-47	107	21.6
	48-59	49	9.9
	Total	496	100
Birth interval	1 year	76	17.0
	2 year	221	49.4
	$\geq$3 year	150	33.6
	Total	447	100.0
birth order	1 year	49	9.9
	2-3 year	150	30.2
	4-5 year	179	36.1
	6+ year	118	23.8
	Total	496	100.0
Place of delivery	home	413	83.3
	health institution	83	16.3
	Total	496	100.0
delivery attendance	TBA	372	75.0
	health personnel	84	16.9
	family	40	8.1
	Total	496	100.0
diarrhea	yes	165	33.3
	no	331	66.7
	Total	496	100.0
fever	yes	171	34.5

Table 3 continued…

	no	325	65.5
	Total	496	100.0
other serious illness	yes	66	13.3
	no	430	86.7
	Total	496	100
birth weight/size at birth	small	85	17.1
	average	234	47.2
	Larger than average	177	35.7
	Total	496	100.0
respiratory disease	yes	82	16.5
	no	414	83.5
	Total	496	100.0
measles	yes	21	4.2
	no	475	95.8
	Total	496	100

5.4. Child caring practice

As indicated in table 4, from the total children, 419(84.5%) had breastfeed and 218(44.0%) of them were initiated breastfeeding practice immediately after birth. In addition to initiation of breastfeeding practice, 270(54.4%) of the children feed colostrum and About 301(60.7%) of children started complementary feeding at the age of 6-8 months, and 173(34.9%) of them were feeding more than four times per day. One hundred fifteen (27.4%) of children continued breastfeeding for more than 24 months. Eighty one (16.3%) had received pre-lactation of food or fluids like Butter, milk or water.

Majority 472(95.2%) of care giver/mothers washed their hands before feeding their children. For most of the children 450(90.7%) their biological mothers was taking care of their feeding.

Concerning immunization majority 453(91.3%) of the children had received immunization, 441 (88.9 %) supplemented with vitamin A and 286(57.7%) of them were dewormed 6 month proceeding the survey *(table 4).*

Table 4:- child caring practice in east Badawacho Woreda, Hadiya zone, SNNPR, March 2014.

Variable	category	Frequency	Percent
breast feed	yes	419	84.5
	no	77	15.5
	Total	496	100.0

Table 4 continued…

initiation of BF	immediately	218	52.0
	hours	166	39.6
	days	35	8.4
	Total	419	100.0
feed colostrum	yes	270	64.4
	no	149	35.6
	Total	419	100.0
continuation of BF	12-23 months	187	44.6
	<11 months	117	27.9
	>24 months	115	27.4
	Total	419	100.0
Pre-lacteal feeding	no	415	83.7
	yes	81	16.3
	Total	496	100.0
initiation of CF	6 -8 month	367	74.0
	<5 month	100	20.2
	>9 month	29	5.8
	Total	496	100.0
	Total	496	100.0
frequency of feeding	<3 times	323	65.1
	$\geq$ 4 times	173	34.9
	Total	496	100
wash your hands feeding the child	yes	472	95.2
	no	24	4.8
	Total	496	100
Bath taking of the child	daily	348	70.2
	weekly	148	29.8
	Total	496	100
taking care of the baby feeding	mother	450	90.7
	sister	24	4.8
	grand mother	13	2.6
	house maid	9	1.8
	Total	496	100
immunization status	yes	453	91.3
	no	43	8.7
	Total	496	100.0
Vitamin A	yes	441	88.9
	no	55	11.1
	Total	496	100
Deworming	yes	286	57.7
	no	210	42.3
	Total	496	100.0

5.5. Characteristics of the environment

From the total household interviewed, almost all accounting for 97.8% were using water from protected source, among them 220(44.4) of the households use 26-50 liters and 197(39.7%) of the households use less than 25 liters of water per day.

Concerning latrine availability, 93.5 percent of the households had latrine and majority 422(90.9%) of the households had traditional pit latrine and 40(8.6) of them had shared latrine. Regarding waste disposal system, 142(28.6%) and 138(27.8%) households were disposing garbage in a pit and burn, respectively. The house type of 327(65.9%) household were thatched and 388(88.8%) of household do not have a separate room for livestock (for those households which had livestock).

Table 5:- Environmental Health characteristics of households in East Badawacho Woreda, Hadiya zone SNNPR, March 2014.

Variable	category	Frequency	Percent
source of drinking water	protected	485	97.8
	unprotected	11	2.2
	Total	496	100.0
water consumption	>51	79	15.9
	26-50	220	44.4
	<25	197	39.7
	Total	496	100.0
have latrine	yes	464	93.5
	no	32	6.5
	Total	496	100.0
Type of latrine	Ventilated (VIP)	2	0.4
	Traditional pit latrine	422	90.9
	shared latrine	40	8.6
	Total	464	100.0
garbage dispose	open field	142	28.6
	in pit	142	28.6
	composting	138	27.8
	On farm land	74	14.9
	Total	496	100.0
house type	thatched	327	65.9
	iron sheet	169	34.1
	Total	496	100.0
separate room for livestock	yes	49	11.2
	no	388	88.8
	Total	437	100.0

5.6. Household food insecurity status

Sixty four percent of the respondents reported to have worried about food shortage during the last four weeks; 66.1 percent reported inability to eat the preferred food: 66.5 percent reported to have eaten limited variety of food; 55.9 percent ate food that they really do not want to eat and unable to eat the preferred variety of food due to lack of adequate resources; 62.3 percent reported that their household members eaten smaller amount of food; 66.1 percent missed the number of meals per day; 32.3 percent experienced ever no food to eat; 10.7 percent reported sleeping without eating food , and 5.8 percent reported to have spent the day and night without eating any food.

Nearly 9 percent of the households enrolled in food aid program in the past 1 month preceding the survey *(table 5)*.

Table 6:- prevalence of household food insecurity in east Badawacho Woreda, Hadiya zone, SNNPR, March 2014.

Variable	category	Frequency	Percent
Worry about food	no	179	36.1
	rarely	129	26.0
	sometimes	148	29.8
	often	40	8.1
Unable to eat preferred foods	no	168	33.9
	rarely	149	30.0
	sometimes	139	28.0
	often	40	8.1
Eat just a few kinds of foods	no	166	33.5
	rarely	151	30.4
	sometimes	131	26.4
	often	48	9.7
Eat foods they really do not want eat	no	204	41.1
	rarely	157	31.7
	sometimes	116	23.4
	often	19	3.8
Eat a smaller meal	no	187	37.7
	rarely	165	33.3
	sometimes	118	23.8
	often	26	5.2
Eat fewer meals in a day	no	165	33.3
	rarely	176	35.5
	sometimes	133	26.8

	often	22	4.4
No food of any kind in the household	no	336	67.7
	rarely	74	14.9
	sometimes	70	14.1
	often	16	3.2
Go to sleep hungry	no	443	89.3
	rarely	28	5.6
	sometimes	23	4.6
	often	2	0.4
Go a whole day and night without eating	no	467	94.2
	rarely	15	3.0
	sometimes	13	2.6
	often	1	0.2
food aid	yes	46	9.3
	no	450	90.7

From the total households included in the survey more than three-fourth of households 376(75.8%) experienced food insecurity in the one month preceding the survey. Among these households 62(12.5%) were mildly food insecure, 162(32.7%) were moderate and 152(30.6%) were severely food insecure.
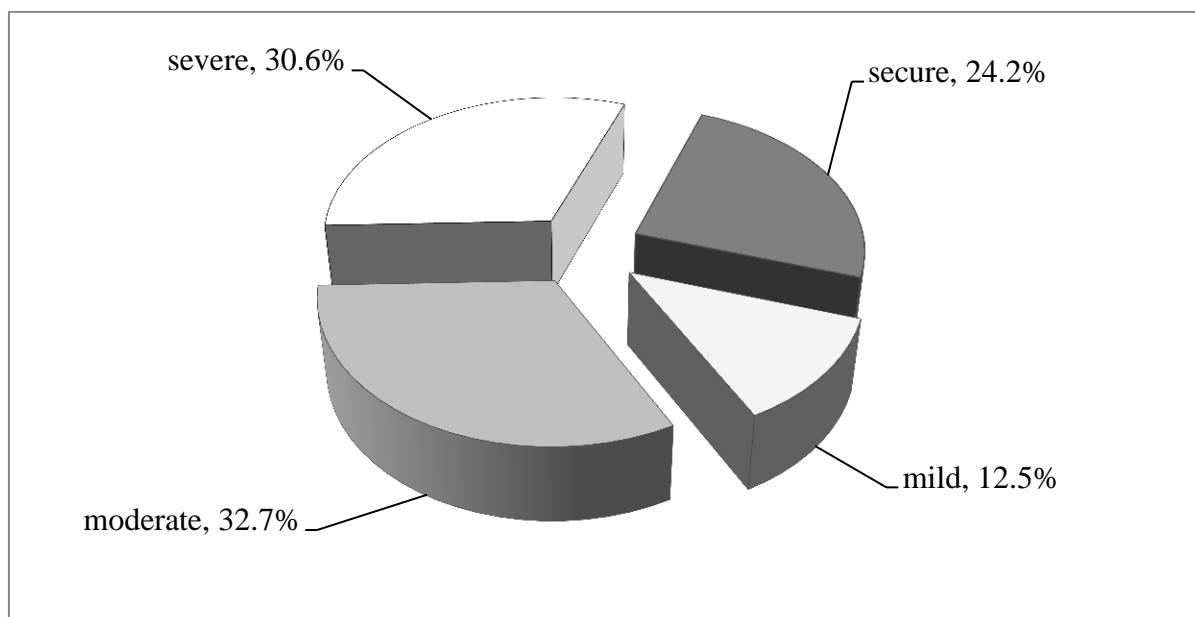
Figure 3: household food insecurity status of East Badawacho Woreda, Hadiya zone, SNNPR, March 2014.

5.7. Nutritional status of children

The overall malnutrition prevalence among under five children was 26.2% for underweight, 45.6% for stunting and 14.6% for wasting. In addition, the proportion of malnutrition by its degree of severity 10.5%, 26.8%, and 8.0% were severely underweight, stunted and wasted respectively while 15.7%, 18.8% and 6.6% were moderately underweight, stunted and wasted respectively. Regarding O-edematous malnutrition 11 (2.2%) children had bilateral O-edema *(table 7)*.

Table 7:- nutritional status of children in east Badawacho Woreda, Hadiya zone, SNNPR, March 2014.

nutritional status of children		Number	percent
Underweight (n= 485)	normal	358	73.8
	moderate	76	15.7
	severe	51	10.5
Stunting (n=496)	normal	270	54.4
	moderate	93	18.8
	severe	133	26.8
Wasting (n=485)	normal	414	85.4
	moderate	32	6.6
	severe	39	8.0
O-edema (n=496)		11	2.2

5.8. Household food insecurity and nutritional status of children

Regarding distribution of nutritional status of children by household food insecurity status, the majority of malnourished children were found in food insecure households, 114(89.7%), 205(90.7%) and 54(76%) for underweight, stunting and wasting respectively.

The mean HAZ, WAZ, and WHZ were all negative, suggesting a generally poor nutritional status of the children in the study. The mean difference for HAZ and WAZ between secure and insecure households was significant (p<0.05). However, the mean WHZ has no significant difference between the two groups. Similarly the prevalence rates of stunting and underweight were slightly higher among children from food-insecure households than among children from food-secure households. However, the prevalence of wasting among children did not differ between food-insecure (14.8%) and food-secure households (14.1%) *(table 8)*.

Table 8: - Stunting, wasting, and underweight among children aged 6-59 months from food-secure and food-insecure households, East Badawacho Woreda, SNNPR, March 2014

nutritional status of children		all children		HHF secure		HHF insecure	
		N	%	N	%	N	%
WAZ	normal	358	73.8	107	89.2	251	68.8
	moderate	76	15.7	8	6.7	68	18.6
	severe	51	10.5	5	4.2	46	12.6
	Total	485	100	120	100	365	100
	mean(±SD)[†]	**-1.13(±1.46)**		**-0.70(±1.27)**		**-1.28(±1.49)****	
HAZ	normal	270	54.4	99	82.5	171	45.5
	moderate	93	18.8	13	10.8	80	21.3
	severe	133	26.8	8	6.7	125	33.2
	Total	496	100	120	100	376	100
	mean(±SD)[†]	**-1.61(±2.29)**		**-0.78(±1.93)**		**-1.88(±2.34)****	
WHZ	normal	414	85.4	103	85.8	311	85.2
	moderate	32	6.6	4	3.3	28	7.7
	severe	39	8.0	13	10.8	26	7.1
	Total	485	100	120	100	365	100
	mean (±SD)[†]	**-0.12(±1.88)**		**-0.03(±1.99)**		**-0.15(±1.84)**	

Note: "household food insecurity status" spans the HHF secure and HHF insecure columns.

**p <0.05- for the difference of means between food-insecure and food-secure households, independent sample t-test
[†] Mean and SD of z-score.

As the main aim of the study was to see the independent association of HHFI with nutritional status of children, both bivariate and multivariable logistic regression analysis was performed to see the association between household food insecurity and the three indices of nutritional status of children controlling the effect of other independent variables.

First bivariate analysis was done for all independent variables separately with each outcome variable. P value of <0.2 was used as a cutoff point to select variables. Then those variables which are important predictors and showed association (p<0.2) with the nutritional status (underweight, stunting and wasting) of children were selected and entered in to multivariable analysis, separately for each outcome. And P value of 0.05 was taken as cut off point to label the significance of the variables in multivariable analysis. According to this three models were developed for the three outcomes variables

During bivariate analysis Nine variables were found to be associated (P<0.2) with underweight and four of them come out to be risk factors in multivariable analysis *(table 10)*.

For stunting, seven variables with p value < 0.2 were selected in bivariate analysis but only three of them showed independent association in multivariable analysis *(table 11)*. Similarly eight variables had p<0.2 with wasting in bivariate analysis but multivariable analysis identified five of them to be significantly associated with wasting *(table 12)*. There was no collinearity between independent variables and hosmer and lemeshow goodness of fit test was also performed for all models and yield significant result (p>0.05).

During both bivariate and multivariable analysis, household food insecurity was associated with stunting and underweight but not with wasting *(table 9)*. Children living in food insecure household have higher risk to be underweight and stunted than children living in food secure households. Children living in food insecure households were 3.82 times more likely to be underweight compared to children living in food secure households (AOR=3.82;CI=1.78, 8.19) and The risk of being stunted, for the children living in food insecure household was 6.7 times higher than those children living in food secure households (AOR=6.7;CI=3.71,12.1).

Table 9:- association of HHFI with nutritional status of children measured by stunting, underweight and wasting in east Badawacho Woreda, Hadiya zone, SNNPR, March 2014.

nutritional status of children	HHFI status	Yes N (%)	Not N (%)	COR(CI)	P-value	AOR(CI)*
underweight	Food insecure	114 (89.8)	251 (70.1)	3.74(2.02-6.93)**	0.001	3.82(1.78-8.19)**
	Food secure	13 (10.2)	107 (29.9)	1		1
stunting	Food insecure	205(90.7)	171(63.3)	5.65(3.38-9.44)**	<0.001	6.70(3.71-12.11)**
	Food secure	21(9.3)	99(36.7)	1		1
wasting[†]	Food insecure	54(76.1)	311(75.1)	1.05(0.58-1.89)	0.84	
	Food secure	17(23.9)	103(24.9)	1		

*Adjusted for other independent variables *(table 10, 11, 12), **p<0.05*

[†]HHFI was not included in multivariable analysis since p-value was above 0.2 in bivariate analysis with wasting

Other important predictors were also identified which showed significant association with nutritional status of children *(Table 10, 11, 12)*.

5.9. Other factors associated with nutritional status of children

To see the independent association of HHFI with nutritional status of children it was adjusted with other variables in multivariable analysis, and some of these variables were also found to be the risk factors for nutritional status of children.

From the variables which were entered to multivariate analysis diarrhea in the last 2 weeks, ANC visit of the mother, health status during pregnancy and HHFI were significantly associated with underweight *(table 10)*.

The risk of being underweight was 2.5 times higher for children who had experienced diarrhea in the last 2 weeks than in children who had not (AOR=2.5; CI=1.52-4.13). The risk of being underweight for children whose mother did not received ANC service was 2.8 times higher than children whose mothers did (AOR=2.8; CI= 1.66-4.7) and Children whose mothers had no good health status during pregnancy were 2.23 times more likely to be underweight than children whose mothers were with good health status during pregnancy (AOR=2.23; CI=1.27-3.94).

In addition extra food during pregnancy and mothers age have showed significant association with underweight in bivariate analysis (p<0.05). The risk of being wasted was 1.66 times higher among mother of children who had not consumed extra food during pregnancy than those mother of children who had consumed extra food during pregnancy (COR=1.66 95% CI=1.03- 2.26). Mother age was also showed significant association on bivariate analysis. Mothers whose age was 25-34 years and >35years were 0.53 and 0.46 times less likely to have underweight children than mothers aged less than 24 years respectively. However they were not significant in adjusted analysis *(table 10)*.

Table 10:- factors associated with nutritional status of children 6-59 months of age, as measured by underweight in East Badawacho Woreda, Hadiya zone, SNNPR, March 2014.

variable	Underweight status		COR(95.0% C.I)	AOR(95.0% C.I)
	Underweight	Normal		
	N (%)	N (%)		
HHFI status				
food insecure	114 (89.8)	251 (70.1)	3.74(2.02-6.93)**	3.82(1.78-8.19)**
Food secure	13 (10.2)	107 (29.9)	1.00	1.00
Diarrhea				
yes	60 (47.2)	97 (27.1)	2.41(1.58-3.66)**	2.51(1.52-4.13)**
no	67 (52.8)	261 (72.9)	1.00	1.00
Size at birth				
larger than average	45 (35.4)	129 (36.0)	1.00	1.00
average	56 (44.1)	173 (48.3)	0.93(0.59-1.46)	0.76(0.43-1.32)
small	26 (20.5)	56 (15.6)	1.33(0.75-2.36)	0.76(0.37-1.55)
Pre-lacteal feeding				
Not pre-lactated	96 (75.6)	312 (87.2)	1.00	1.00
Pre lactated	31(24.4)	46(12.8)	2.19(1.31-3.64)**	1.81(0.97-3.33)
Health status during pregnancy				
sick	37 (29.1)	49 (13.7)	2.59(1.59-4.22)**	2.23(1.27-3.94)**
good	90 (70.9)	309 (86.3)	1.00	1.00
Extra food during pregnancy				
no	98 (22.8)	240 (33.0)	1.66(1.03-2.65)**	0.98(0.55-1.74)
yes	29 (77.2)	118 (67.0)	1.00	1.00
Birth interval				
<2 year (<23m)	26(22.8)	48(14.8)	1.80(0.97-3.34)	1.41(0.7-2.85)
2 year (24-35m)	55(48.2)	166(51.2)	1.10(0.67-1.81)	1.08(0.62-1.87)
>3 year (>36m)	33(28.9)	110(34.0)	1.00	1.00
Mother age				
<24	19 (15.0)	30 (8.4)	1.00	1.00
25-34	88(69.3)	260 (72.6)	0.53(0.28-0.99)**	0.48(0.19-1.19)
>34	20 (15.7)	68 (19.0)	0.46(0.21-0.99)**	0.43(0.15-1.24)
ANC visit				
no	56 (44.1)	87 (24.3)	2.45(1.60-3.76)**	2.8(1.66-4.7)**
yes	71 (55.9)	271 (75.7)	1.00	1.00

**p- value <0.05

From the variable which were identified as candidates and entered in to multivariable regression analysis (to identify potential predictors) for stunting; child age, initiation of complementary feeding and HHFI were found to be significantly associated with stunting. Stunting was high in the age group of 12-23 months (26.5%) and 36-47(28.3%), however only children in the age group 36-47 months showed significant association with stunting. Children in the age group of 36-47 months were about 2 times more likely to be stunted than children age 6-11 months (AOR=2.17;95%;CI=1.11-4.28). It was also observed that children who had initiated complementary feeding early (before 6 month) were 2.41 times at risk to be stunted than children who had started complementary feeding timely (6-8 months) (AOR=2.41;CI=1.36-4.27).

Frequency of feeding was significant in unadjusted analysis, children who ate 1-2 meals per day were 1.53 times more at risk for stunting than children who ate more than 4 meals per day (COR= 1.53;CI=1.05-2.23), however it was not significant in multivariable analysis. Mothers who had no education had about 2 times more likely to have stunted child than mothers who are educated above secondary level in unadjusted analysis *(table 11)*.

Table 11:- factors associated with nutritional status of children 6-59 months of age, as measured by stunting (height for age) in East Badawacho Woreda, Hadiya zone, SNNPR, March 2014.

variable	Stunting status		COR(95.0% C.I)	AOR(95.0% C.I)
	stunted	normal		
	N (%)	N (%)		
HHFI status				
food insecure	205(90.7)	171(63.3)	5.65(3.38-9.44)	6.70(3.71-12.11)**
food secure	21(9.3)	99(36.7)	1.00	1.00
child sex				
male	112(49.6)	133(49.3)	1.01(0.71-1.44)	0.88(0.61-1.31)
female	114(50.4)	137(50.7)	1.00	1.00
Child age in month				
6-11	32(14.2)	35(13.0)	1.00	1.00
12-23	60(26.5)	71(26.3)	0.92(0.51-1.66)	1.14(0.61-2.14)
24-35	52(23.0)	90(33.3)	0.63(0.35-1.14)	0.84(0.44-1.59)
36-47	64(28.3)	43(15.9)	1.63(0.88-3.01)	2.17(1.11-4.28)**
48-59	18(8.0)	31(11.5)	0.63(0.29-1.35)	0.93(0.41-2.08)
Initiation of CF				
<5 month	57(25.2)	43(15.9)	1.75(1.12-2.74)**	2.41(1.36-4.27)**
6-8 month	158(69.9)	209(77.4)	1.00	1.00
>9 month	11(4.9)	18(6.7)	0.81(0.37-1.76)	1.05(0.43-2.55)
education of mother				
no education	110(48.7)	107(39.6)	2.09(1.21-3.61)**	0.95(0.48-1.86)
primary	91(40.3)	112(41.5)	1.65(0.95-2.88)	0.76(0.38-1.52)
secondary and above	25(11.1)	51(18.9)	1.00	1.00
ever breast feed				
no	35(15.5)	42(15.6)	0.99(0.61-1.62)	0.77(0.39-1.54)
yes	191(84.5)	228(84.4)	1.00	1.00
frequency of feeding				
<3times	159(70.4)	164(60.7)	1.53(1.05-2.23)**	0.99(0.62-1.56)
≥4 times	67(29.6)	106(39.3)	1.00	1.00

** p –value <0.05

Among the variables which were entered to multivariable analysis for identifying predictors of children wasting; child sex, ANC visit of the mother, diarrhea in the last 2 weeks, pre-lacteal feeding and birth interval were found to be important predictors of wasting.

Male children were 1.89 times more at risk for wasting than female children (AOR=1.89; CI=1.01-3.54) and the risk of being wasted was 2.28 times higher for children who had experienced diarrhea in the last 2 weeks than in children who had not (AOR=2.28;CI=1.19-4.38). The result also revealed that Children who were pre-lactated at birth were 5.28 times more likely to be wasted than children who were not experienced pre-lacteal feeding at their birth (AOR=5.28; CI=2.45-11.36). The risk of being wasted for children whose mother received ANC service was 1.95 times higher than children whose mothers did not (AOR=1.95;CI=1.01-3.8). In addition, Children who had <2 year birth interval from the preceding child had 3.44 times higher risk to be wasted than children who had more than 3 years birth interval(AOR=3.44; CI=1.38-8.58).

The unadjusted analysis was also showed that children who continued breastfeeding for more than 2 years were 0.47 times less likely to be wasted than children who breastfeed for 12-23 months (AOR=0.47; CI=0.23-0.94). But it was not significant in adjusted result.

Table 12:- factors associated with nutritional status of children 6-59 months of age, as measured by stunting (height for age) in East Badawacho Woreda, Hadiya zone, SNNPR, March, 2014.

Variable	Wasting status		COR(95.0% C.I)	AOR(95.0% C.I)
	wasting	normal		
	N (%)	N (%)		
child sex				
Male	40(56.3)	200(48.3)	1.38(0.83-2.29)	1.89(1.01-3.54)**
Female	31(43.7)	214(51.7)	1.00	1.00
Diarrhea				
No	34(47.9)	123(29.7)	1.00	1.00
Yes	37(52.1)	291(70.3)	2.17(1.30-3.62)**	2.28(1.19-4.38)**
Pre lacteal feeding				
Not pre-lactated	48(67.6)	360(87.0)	1.00	1.00
Pre-lactated	23(32.4)	54(13.0)	3.19(1.8-5.67)	5.28(2.45-11.36)**
continuation of BF				
<11 months	15(23.1)	98(28.5)	0.59(0.3-1.13)	0.66(0.31-1.40)
12-23 months	38(58.5)	147(42.7)	1.00	1.00
>24 months	12(18.50	99(28.8)	0.47(0.23-0.94)**	0.48(0.21-1.07)
colostrum feeding				
No	30(46.2)	115(33.4)	1.70(0.99-2.92)	1.33(0.69-2.57)
Yes	35(53.8)	229(66.6)	1.00	1.00
ANC visit				
No	34(47.9)	109(26.3)	2.57(1.54-4.30)**	1.95(1.01-3.80)**
Yes	37(52.1)	305(73.7)	1.00	1.00
birth interval				
<2 year (<23m)	19(27.9)	55(14.9)	3.45(1.6-7.5)	3.44(1.38-8.58)**
2 year (24-35m)	36(52.9)	185(50.0)	1.94(0.99-3.81)	2.16(0.97-4.80)
>3 year (>36m)	13(19.1)	130(35.1)	1.00	1.00
frequency of feeding				
<3times	53(74.6)	262(63.3)	1.71(0.96-3.02)	1.14(0.54-2.39)
≥4 times	18(25.4)	152(36.7)	1.00	1.00

** p –value <0.05

CHAPTER SIX

6. DISCUSSION

6.1. Household food insecurity status

In this study it was found that 75.8% of the households experienced some degree of food insecurity in the one month preceding the survey. This result was similar with the results of other studies conducted in Ethiopia, Wolayita and Oromia zones where 74.2 % and 73.1% of households face food insecurity respectively(29,30).   This may be due to that this areas are found geographically adjacent to this study are so that they have similar agro ecology. Therefore, they are expected to have the same food production in amount and type.

This study also showed that 62.3 % of the households reported that their household members eaten smaller amount of food during the last four weeks and 66.1 % missed the number of meals per day while 32.3 % experienced ever no food to eat. This result was consistent with the study conducted in Sidama (28) that 67.4 eaten smaller amount of food and 62.9 percent missed the number of meals per day while 29.8% experienced no food to eat.

Similarly the current study revealed that 10.7% households reported that sleeping without eating food. This finding was also in line with other study which is conducted in Ethiopia, Bangladesh and Vietnam from the data obtained from the Alive & Thrive baseline survey. The result showed that 11.4% households in Ethiopia faced sleeping without eating(39).

Results from Ethiopia showed that 16.9%, 34.1% and 15.4% of the households were mild, moderate and severely food insecure respectively(39) and the overall house food insecurity was 66.4%. From the results of the present study it was found that 12.3%,32.3% and 31.0% households were mild, moderate and severely food insecure with overall food insecurity of 75.8%. The result of this study was slightly higher. The differences may be attributed to the fact that the above mentioned study used a larger sample size and the samples were selected from different parts of the country having a varying geography, annual rain fall and farm land size. So that, they may have different amount and type of food production consequently they will have a different extent of food insecurity. This implies that area specific surveys are better to understand the real situation of the area as the average result of different areas may not be

the same with the actual figures of specific areas. Since the problem of one area will possibly be hidden by another.

In contrary, another study conducted in shone district (31), SNNPR revealed that 54.4 percent of households reported that they worried always about food shortage and (94.4%) of respondents also cuts the size of food and eating less than they felt, while (30.5%) of adults were not eating the whole day(31). These findings are higher than the current study. This difference is probably attributed to the seasonal variation, as the two studies were conducted in different seasons and year and this implies that the prevalence HHFI may vary across seasons and years.

6.2. Nutritional status of children

The result for nutritional status of children was 26.3% for underweight, 45.6 % for stunting and 14.6% for wasting. The regional prevalence of underweight, stunting and wasting was 28.3%, 44.1% and 7.6% respectively based on EDHS 2011.

The result of the present study showed that, the figures are comparable with the regional figure (19). However, the figures, especially of wasting prevalence (14.6%), are slightly high in the current study. Similarly, severe stunting and wasting was very high as compared to the regional 22.9% and 1.9%. But severe underweight 10.5% was alike with regional figure 9.6%. The high prevalence of malnutrition, mainly of wasting, in this study may be due to that most of the households in the study area face shortage of food during Belg season (February - May).The data was collected in this season. During this season, household's food reserve from the previous year gets smaller and the market price of the crops will increase. In addition, livestock body conditions and productivity will also be deteriorated. Furthermore, high proportion of child diarrhea in this study may possibly be attributing to the high prevalence of malnutrition. Though, the prevalence of underweight was similar with the national figure, it was very low compared to underweight prevalence reported by other studies conducted in Oromia (30.9%)(30), Tigray (38.3%)(35), west Gojam (49.2%)(38), Somale (47.7%)(33) and Jimma (34.2)(40). However, the prevalence of stunting (45.6) was similar with the study of Oromia (47.6%) and west Gojam (43.2%). Whereas it was higher than that of Jimma (40.4%) and Somali (34.4%) and the prevalence of wasting (14.8%) was similar with the above studies except for Jimma (5.1%) which was lower than the current study. The data for this research

was collected in March, and mostly food insecurity in SNNPR areas is likely to be higher from January to March(50). So that, there will be increase in acute child malnutrition. For most of the above literatures their study period is different from the current study this may possibly be the reason for the difference in proportion.

6.3. Household food insecurity and nutritional status of children

Regarding distribution of malnourished children between food secure and insecure households, the majority of malnourished children are found in food insecure households, though the prevalence of wasting was almost similar in food secure and insecure households which is comparable with the findings in Nepal (27).

The study of Nepal revealed that the prevalence rates of stunting and underweight were slightly higher among children from food-insecure than among children from food-secure households. In the present study the mean difference for HAZ and WAZ between secure and insecure households was significant ($p<0.05$) However, the mean difference WHZ was not significant between the two groups. This result was also consistent with the finding of Nepal (27). This similarity may be due to that study of Nepal used the same tool with the current study to assess the food insecurity status of households and their prevalence of overall food insecurity 69.2% and their prevalence of malnutrition was slightly closer to findings of the current study (75.6%). consequently the distribution of malnourished children in the two groups of households showed similarity with current study.

Unlike the present study, another study which was conducted in Brazil (38) showed that WHZ mean value was lower for children who lived in moderate to severe food insecurity compared to children in food secure households. This difference may be due to that the method they used to assess household food insecurity status differs from the current study as a result their prevalence of HHFI was also very low (48.6%) compared to the current study (75.8%).

In this study children living in food insecure household had 3.8 times higher risk of being underweight. It is expected that children in food insecure households may face reduced dietary variety or nutrient intake of food which will later result in malnutrition. Similarly The risk of being stunted, for the children living in food insecure household was 6.7 times higher than those children living in food secure households. It is known that stunting is result of long time effect of under nutrition. Thus, children living in households, where food insecurity remains

the same over years will face this problem and expected to be stunted. However the present study assesses the situation of only one month preceding the survey and this was found to be the limitation of this study. Still this result was consistent with the study which was conducted in Ghana (36); Households that were food insecure were more likely than the households that were food secure to have children with chronic malnutrition. This can be explained as, though HHFI vary across time, sometimes it may persist for a long time causing chronic malnutrition.

The current study showed that children living in food insecure households had no difference in wasting from children living in secure households. However, other literatures (37) have identified HHFI to be associated with acute malnutrition, but their method to assess HHFI was completely different from the current study as a result they yield a lower proportion of HHFI, this might be the reason for this disparity.

6.4. Other factors associated with nutritional status of children

The fourth objective of our study was to see other factors associated with nutritional status of children other than HHFI. Since child malnutrition is not the mere effect of HHFI.

Accordingly, multivariable logistic regression analysis identified diarrhea, health status during pregnancy, ANC visit of the mothers and HHFI to be associated with underweight. Initiation of complementary feeding, child age and HHFI were found to be associated with stunting. In addition child sex, diarrhea, pre-lacteal feeding, ANC visit and birth interval were found to be risk factors for wasting.

In this study children who had diarrhea in the past 2 weeks preceding the survey were 2.5 times higher at risk for underweight and 2.28 times higher at risk for wasting than children who had not. This result was expected since diarrhea leads to malnutrition and malnutrition predisposing to diarrhea. It is also known that malnourished children will have frequent diarrheal episodes and loses weight and can quickly become malnourished (19). This result was consistent with finding of other studies (19,37,47).

Health status during pregnancy was also a risk factor for underweight that children whose mothers had no good health status during pregnancy were 2.23 times more likely to be underweight than children of mothers with good health status during pregnancy. Illness during pregnancy will prevent the mother from gaining weight thus she will probably give a low birth

weight baby and babies reported as very small or small at birth are much more likely to be underweight later in life (19).

Similarly children whose mothers did not receive ANC service were 2.8 times higher at risk for underweight and 1.95 times higher at risk for wasting than children whose mother did not. This finding may be explained by high contact of mothers with the health service and mothers who attended ANC visit will find advice about good child feeding practice. Such mothers also have better heath seeking behavior and they are likely to take appropriate actions to improve the health status of their children, which is also important component of child nutrition. This result was in line with other study(42) conducted in Ethiopia.

According to WHO recommendation a child should start complementary feeding in 6-8 months of age. Study conducted in west Gojam (38) revealed that children who started complementary feeding lately were at risk for stunting. Similarly the result of this study indicated that children who had initiated complementary feeding early (before 6 month) were 2.41 times at risk to be stunted than children who had started complementary feeding timely (6-8 months).

The national EDHS 2011 indicated that, the prevalence of stunting increases as the age of child increases. Similarly the result of this study showed that the prevalence of stunting increasing from 6-11 months of children to 36-47 months and highest risk of stunting was seen among children aged 12-23 and 36-47 months but the risk was significant in age group of 36-47 month. Children aged 36-47 months were 2.17 times more likely affected by stunting as compared to children aged 6-11 months. This may be explained by the fact that foods for weaning are typically introduced to children in the older age group, thus it increases their exposure to infections and susceptibility to illness. This tendency, coupled with inappropriate or inadequate feeding practices, may contribute to faltering nutritional status among children in these age groups (19). This result was consistent with other findings of Somale and Vietnam (33, 37).

In addition, the present study also indicated that Children who were pre-lactated at birth were 5.28 times more likely to be wasted than children who were not. The practice of giving pre-lacteal feeds is discouraged because it limits the Infant's frequency of suckling and exposes the baby to the risk of infection (19). According to EDHS 2011 national report, nearly three children in every ten (27 percent) are given pre-lacteal feeds within the first three days of life.

This finding agrees with previous literatures, which have shown that children who received pre-lacteal were more likely to be wasted (33).

A number of studies in Ethiopia and other developing countries suggest that malnutrition among boys is consistently higher than malnutrition among girls (33-34, 37-38, 45). Similar result was found in the present study, the odds ratio of being wasted was 1.89 times higher among male children than among female. This result could be due to unmeasured factors like parental gender preference or sex difference in feeding practice which needs further investigation.

Children who had <2 year birth interval from the preceding child had 3.44 times higher risk to be wasted than children who had more than 3 years birth interval. This result is consistent with others studies (19,41). Children born too soon after a previous birth, especially if the interval between the births is less than two years, are at increased risk for health problems. This may be due to child nutritional status is expected to improve with higher birth spacing as the mother would get enough time for care and feeding. When pregnancies are closely spaced, it is often the case that the mother will have little time to regain lost fat and nutrient stores. This implies longer birth intervals improve the health status of both mother and child.

In several studies mother's education level had been associated with nutritional status of children (43,33,45). We found that the prevalence of malnutrition decreased with increasing of educational status. However it was not statistically significant in adjusted analysis. This may be due to that this study is conducted in rural setting thus the educational status for most the mothers expected to be homogeneous. So that nutritional status of children may not show a difference in educational status.

Also size at birth of the child was significant in bivariate analysis with underweight. However the association disappeared when adjusting for other covariates. This could be due to that data on birth size are collected by mother's perception towards their child's size during birth. Therefore there may be a recall bias.

Similarly Colostrum feeding had lost to show association in this study unlike from other studies (45). It can be well explained by the fact that the child who feed colostrum has got a natural immunity for childhood infections; however as the child age increases there may be other factors like diarrhea, inappropriate feeding practices and the likes which lead to

malnutrition. So that, the positive effect of colostrum feeding may possibly be hidden by these factors.

Different from other studies(41,42), no association was found between underweight, stunting and wasting and the mother's age at birth in this study. As most the mothers are not educated they may not know their exact age, suggesting that the data on mother's age may probably be subjected to recall bias.

In the same way, all environmental health related characteristics investigated also failed to have a statistically significant association with any of the child nutritional status characteristics (stunting, wasting and underweight). This is inconsistent with the reports of EDHS 2011 and other studies too (41,42). This may be related to the fact that child nutritional status is not susceptible to environmental health conditions since most of the households had latrine and use water from protected source.

Strength and Limitation of the study

Strength of the study

In this study, three indices were used in order to assess the nutritional status of children. Probability sampling technique was used and data was collected by experienced data collectors who were involved in other similar field surveys. To minimize recall bias prominent local events were used

Limitation of the study

As the design of the study was cross-sectional, its ability to draw cause effect relationship was limited. The analysis was based on the data that was collected during one season of the year, but the magnitude of household food insecurity may vary across seasons, so that data which shows seasonal variations may be needed to fully understand household food insecurity and its association with nutritional status (especially for stunting) of children.

Recall bias was also possible. Hence, some of the variables were based on a recall to a situations happened few weeks or months back from the actual data collection time. And this might explained high or low prevalence of household food insecurity. Despite these limitations, the results of this study will provide important contributions to the limited data available on household food insecurity and nutritional status of children in the study area.

CHAPTER SEVEN

7. CONCLUSSION AND RECOMMENDATIONS

7.1. Conclusion

Household food insecurity and the prevalence rates of stunting, underweight and wasting, among children 6 to 59 months was high in east Badawacho Woreda , Hadiya zone, SNNPR. Though, the prevalence of malnutrition in the area is similar with the regional and national figure, the finding of this study indicates that malnutrition is still an important major public health problem among children in the area.

Household food insecurity was significantly associated with underweight and stunting but not with wasting.

In addition diarrhea, health status during pregnancy and ANC visit come out to be significant risk factors for underweight. Initiation of complementary feeding and child age were found to be associated with stunting. Also child sex, diarrhea, pre-lacteal feeding, ANC visit and birth interval were found to be risk factors for wasting. Thus, improving only household food security may be necessary but not sufficient to improve the nutritional status of children 6-59 months of age.

Programs to improve HFI along with other nutrition interventions may enable greater synergy and sustainable impacts in addressing childhood under nutrition than just nutrition-specific interventions.

7.2. Recommendations

For Zonal and Woreda health office

- Nutrition program should be strengthened to tackle the problem of malnutrition at community level depending the on the severity of malnutrition identified in this study.
- Pregnant and lactating mothers, Adolescent girls and also elderly women should be educated for promotion and advancement of optimal infant and young child feeding practices for improving nutritional status of children.
- Give attention for the prevention of diarrheal disease

For Health care providers

- To improve the feeding practice of parents on appropriate children feeding, Nutrition education should be strengthened
- Conduct and Sustain regular follow up on nutritional status of children in the community.
- Giving information about diarrhea management for mothers in the study area.

For other stakeholders (ARDO, CTGCO, WCAO and other NGOs)

- Inter-sectoral collaboration is needed to act up on and develop an intervention strategy which focuses on improving the household food security by strengthening safety-net programs, together with an overall socioeconomic wellbeing of families.
- Use of media of mass communication with reportage of necessary health care information may prove to be useful in improving nutritional status.
- Continued attention and education is mandatory to avoid traditional feeding practices such as giving butter as pre-lacteal feeding by rural community.

For researchers

- Further study should be done to see other unexplored associated factors that were not included in the present study like parental gender preference and sex difference in feeding practice.
- Longitudinal studies should be done to clearly understand the situation of household insecurity across different seasons, and to see its effect as well.

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ANNEX I: QUESTIONNAIRE

JIMMA UNIVERSITY
COLLEGE OF PUBLIC HEALTH AND MEDICAL SCIENCES
DEPARTMENT OF EPIDEMIOLOGY

A questionnaire prepared on the title: Household food insecurity and its association with nutritional status of children aged 6-59 months in East Badawacho Woreda, SNNPR

Good morning/afternoon, my name is _____ I am part of a team carrying out a study conducted by an epidemiology post graduate student in Jimma University.

Currently we are conducting a study on household food insecurity and its association with nutritional status of children 6-59 months of age.

We would like to ask you some questions that are very essential not only, for the successful accomplishment of the study but also for producing relevant information which will help program planners and other stake holders to plan and make intervention to improve nutritional status of children as well as household food insecurity status.

If you participate in the study, it will not take us more than 30 minutes. I would like to assure you that all that is said during the interview will be strictly confidential and that the information collected from you will be used only in scientific reports without mentioning any of your personal identification including your name. You don't have to answer any questions that you don't want to answer and you may end this interview at any time you want.

However, we hope that you will participate in this study since your views are important.

We appreciate your participation in this survey by genuinely responding to the interviews.

Do you have any questions? Would you be willing to participate in this study?

Yes_____

If no thank and stop here.

Questionnaire identification number_____

Kebele _____

House number_____

Interviewer's name and signature _____

(Certifying that the respondents have given informed consent verbally).

Supervisor's name and signature _____

Date of interview_____

General instruction

Almost all of the questions have a pre coded response. So it is important to follow the following instructions while you are interviewing the respondents and recording their responses

> ➢ Ask each questions exactly as written on the questionnaire
> ➢ Do not read the pre coded responses for the respondents, listen only the response of the respondents then Circle the responses that best match with the answer of the respondent

❖ **All the questions are inquired to the mother(caregiver) of the child**
PART ONE: CHARACTERSTICS OF HOUSEHOLD

No	Question	option	Skip to/Remark
101	Head of the household	1. Female 2. Male	
102	Total family size (How many person live in the Household?)	In number_____	
103	How many children <5 year live in the household?	In number_____	
104	Educational level of mother	1. illiterate 2. Grade 1-8 3. grade 9-12 4. Collage and above	
105	Educational level of father	1. Illiterate 2. Grade 1-8 3. Grade 9-12 4. Collage and above	
106	Occupation of mother	1. House wife only 2. Farmer 3. Merchant/Trade 4. Private Organization employee 5. Government employee 6. Daily laborer 7. Other (specify)	
107	Occupation of father	1. Farmer 2. Government employee 3. Merchant/Trade 4. Private Org. employee 5. Daily worker 6. Other (specify)----	
108	Ethnicity	1. Hadiya 2. Kembata 3. Woliyita 4. halaba 5. Others (specify)	

109	What is your religion?	1. 1 Protestant. 2. Orthodox 3. 3.Muslim 4. Catholic 5. Others(specify)		
110	**What did you produced in your land in the past 1 year**	**Quantity produced /quintals/year (A)**	**Current price/quintal (B)**	**(A)*(B)**
	1. Maize			
	2. teff			
	3. boloke (adenguare)			
	4. others			
				Total_____
111	**Do you have any of the following items?**	**1. yes**	**2. No**	
	Radio	1	0	
	Television	1	0	
	Table	1	0	
	Chair	1	0	
	Bed	1	0	
	Cabinet	1	0	
	Telephone (fixed and mobile)	1	0	
	Bank account	1	0	
	Horse/mule /Donkey	1	0	
	Milk cows, oxen or bulls	1	0	
	Goats	1	0	
	Sheep	1	0	
	Chickens	1	0	
	Beehives	1	0	
	Own agricultural land	1	0	
	Land Size >0.5 hectare(2 timad)	1	0	

PART TWO: MATERNAL CHARACTERSTICS

201	Mother's age in years	_____	
202	Marital status	1. Single 2.Married 3. Divorced 4. Widowed	If single skip to 204
203	How old were you when you get married	_____	
204	Total number of children ever born?	_____	
205	What is the age interval b/n index(NAME) and the elder child	_____	
206	During pregnancy or lactation, did you consume extra food? (the child under the study)	1. Yes 2. No	
207	Health status during the pregnancy?	1. Good 2. Not good/sick	

208	Did you visited health facility for ANC during pregnancy of child (name)	1.yes 2. No _____→	skip to 209
209	How many times you visited health facility for ANC during the pregnancy?	_____times	
210	Have you enrolled in food aid program in the past 1 month?	1. Yes 2. no	

PART THREE: CHILD CHARACTERSTICS

301	Child's sex	1. Male 2. Female	
302	Child's age	_____ Months	
303	Birth interval(space between previous pregnancy)	_____ years	
304	Birth order	_____	
305	Place of delivery	1. Home 2. Health institution 3. Other (specify)	
306	Who attended your delivery	1. TBA 2. Health personnel 3. Other (specify)	
307	Gestational age at birth	_____month	
308	Was your child weighed at birth	1. Yes 2 no _____→	skip to 310
309	How much was the weight?	_____ Grams (card/recall?)	
310	When (NAME) was born, How big was he/she?	1. Very large 2. large 3. Average 4. small 5. Don't know	
311	Type of birth	1. Single 2. Multiple/Twin/	
312	Does the child ever been immunized?	1. Yes 2. no	If no skip to 314
313	Vaccines received(See card, if no card available ask them to recall)	1. BCG(See Scar) 2. Pentavalent vaccine (Number of of doses) 3. Polio vaccine 4. Measles 5. don't know /no card	
314	Vitamin A supplementation in the past six months?	1. Yes 2. No 3. Don't know/not sure	
315	Does the child been dewormed in the past six month	1. Yes 2. No	

		3. Don't/not sure	
316	Has the child had diarrhea in the last two weeks	4. Yes 5. no ⟶ 6. Do not know/not sure	If no skip to 317
317	How frequent in a day	1. Once 2. Twice 3. 3-4 times 1. More than 4 times	
318	Presence of respiratory disease in the last two weeks	1. Yes 2. No 3. Do not know /not sure	
319	Has the child had fever in the last two weeks?	1. Yes 2. No 3. Do not know	
320	Has the child get sick with measles in the last year?	1. Yes 2. No 3. Do not know/not sure	
321	Has the child had any other serious illness in the past two weeks?	1. Yes 2. No 3. Don't know/not sure	
322	Presence of oedema on the child (Observe)	4. Yes 5. No	

PART FOUR: CHILD CARING PRACTICE

401	Did you ever breast fed the child (NAME)?	1. Yes ⟶ 2. No	If yes skip to 403
402	If no, reason for not breastfeeding?	Reason_____	
403	How long after birth did you first out the child to breast feed?	1. Immediately 2. ____ Hours (If less than 24 hours record hour) 3. ____ Days 4. Don't know/not sure/	
404	Do the child feed colostrum (the first breast milk)	1. Yes 2. no	
405	Have you given anything to the child immediately after delivery (other than breast milk)	3. Yes 4. no	If no skip to 407
406	If yes, Which one have given	1. butter 2. water 3. milk 4. other(specify)	
407	At what age did you start feeding other additional food?	_____Month	
408	What do you feed the child other than breast milk? (More than one answer	1. Porridge 2. Soup	

	possible)	3. Milk 4. Fruits 5. Same food with other family 6. Other, specify_____	
409	How many times do you feed the child?	1. 1-2 times 2. Three times 3. 4 times 4. More than 4 times	
410	What do you use to feed the child	1. Bottle 2. Cup 3. Spoon 4. Other (specify)	
411	How many months did you breast-fed the child?	_____Months	
412	Do you wash your hands whenever you feed the child	1. Yes 2. no	
413	Bath taking of the child?	1. daily 2. weekly 3. Other (specify)	
414	Who is usually taking care of the baby feeding?	1. Mother 2. Sister 3. Grand mother 4. House maid 5. Other (specify)	

PART FIVE: HOUSEHOLD FOOD INSECURITY MEASURING TOOLS

501	In the past four weeks, did you worry that your household would not have enough food?	1. Yes 2. No(skip to Q502)	....|___|
501 a.	How often did this happen?	1. Rarely (once or twice in the past four weeks) 2. Sometimes (three to ten times in the past four weeks) 3. Often (more than ten times in the past four weeks	....|___|
502	In the past four weeks, were you or any household member not able to eat the kinds of foods you preferred because of a lack of resources?	1. Yes 2. No(skip to Q503)	....|___|
502.a	How often did this happen?	1. Rarely (once or twice in the past four weeks) 2. Sometimes (three to ten times in the past four weeks) 3. Often (more than ten times in the past four weeks	....|___|
503	In the past four weeks, did you or any household member have to eat a limited variety of foods due to a lack of resources	1. 1=Yes 2. 2=No(skip to Q504)	....|___|
503.a	How often did this happen?	1. Rarely (once or twice in the past four weeks) 2. Sometimes (three to ten times in the past four	....|___|

60

		weeks)	
		3. Often (more than ten times in the past four weeks	
504	In the past four weeks, did you or any household member have to eat some foods that you really did not want to eat because of a lack of resources to obtain other types of food?	1. Yes 2. No(skip to Q505)	....|___|
504.a	How often did this happen?	1. Rarely (once or twice in the past four weeks) 2. Sometimes (three to ten times in the past four weeks) 3. Often (more than ten times in the past four weeks	....|___|
505	In the past four weeks, did you or any household member have to eat a smaller meal than you felt you needed because there was not enough food?	1. Yes 2. No(skip to Q506)	....|___|
505.a	How often did this happen?	1. Rarely (once or twice in the past four weeks) 2. Sometimes (three to ten times in the past four weeks) 3. Often (more than ten times in the past four weeks	....|___|
506	In the past four weeks, did you or any other household member have to eat fewer meals in a day because there was not enough food?	1. Yes 2. No(skip to Q507)	....|___|
506.a	How often did this happen?	1. Rarely (once or twice in the past four weeks) 2. Sometimes (three to ten times in the past four weeks) 3. Often (more than ten times in the past four weeks	....|___|
507	In the past four weeks, was there ever no food to eat of any kind in your household because of lack of resources to get food?	1. Yes 2. No(skip to Q508)	....|___|
507.a	How often did this happen?	1. Rarely (once or twice in the past four weeks) 2. Sometimes (three to ten times in the past four weeks) 3. Often (more than ten times in the past four weeks	....|___|
508	In the past four weeks, did you or any household member go to sleep at night hungry because there was not enough food?	1. Yes 2. No(skip to Q509)	....|___|
508.a	How often did this happen?	1. Rarely (once or twice in the past four weeks) 2. Sometimes (three to ten times in the past four weeks) 3. Often (more than ten times in the past four weeks	....|___|
509	In the past four weeks, did you or any household member go a whole day and night without eating anything because there was not enough food?	1. Yes 2. No(skip to next section)	....|___|

		1. Rarely (once or twice in the past four weeks) 2. Sometimes (three to ten times in the past four weeks) 3. Often (more than ten times in the past four weeks	....|___|
509.a	How often did this happen?		

PART SIX: ENVIRONMENTAL FACTORS

601	What is your main source of drinking water?	1. 1.Private tap 2. 2.Private well 3. 3.Public tap 4. Other (specify)	
602	Daily water consumption	_____liter	
603	Do you have latrine?	1. Yes 2. No	If no skip to 117
604	Type of latrine you use? (Observation)	1. Private pit / wooden slab 2. Private slab / cement slab 3. Shared latrine/wooden slab 4. Other (Specify)	
605	How do you dispose garbage?	1. Open field disposal. 2. In a pit 3. Composting 4. Other (specify)	
606	house type (observe)	1. tukul/tached 2. corrugated iron sheet 3. other(specify)	
607	Do you have separate room for livestock?	1. Yes 2. No	

PART SEVEN: ANTHROPOMETRIC MEASURMENTS

S. no	MEASURMENT	Value	remark
701	Childs Date of birth (date/month/year)		
702	Child weight in kilogram		
703	Child height in centimeters		
704	Maternal Weight in kilogram		
705	Maternal Height in centimeter		

የህብረተሰብ ጤና እና ሕክምና ሳይንስ ኮሌጅ

የኢፒዲሞሎጂ ትምህርት ክፍል

በምስራቅ ባዳዎች ወረዳ ከአምስት አመት በታች ባሉ ህፃናት የስነ ምግብ ሁኔታ እና የቤተሰብ የምግብ ዋስትና ላይ ለሚሰራ ጥናት የተዘጋጀ መጠይቅ

አንደምን ዋሉ/አደሩ አኔ----------------------አባላለሁ በጅማ ዩኒቨርሲቲ ኢፒዲሞሎጂ ትምህርት ክፍል የሁለተኛ ዲግሪ ተማሪ በሚስራው ጥናት ላይ መረጃ ሰብሳቢ ቡድን አባል ነኝ:: ጥናቱ የሚያተኩረው በሕፃናት የስነ ምግብ ሁኔታና የቤተሰብ ምግብ ዋስትና ላይ ነው::

እርስዎን የተወሰኑ ጥያቄዎች ለመጠየቅ እንፈልጋለን ፤የሚሰጡትም ምላሽ ለዚህ ጥናት ከፍተኛ ጥቅም ከመስጠቱም ባሻገር በችግሩ ዙሪያ ለሚሰሩ መንግስታዊ እና መንግስታዊ ላልሆኑ ድርጅቶች አንደ አንድ ግብዓት ያገለግላል ::መጠይቁ ከ ግማሽ ሰዓት በላይ አይወስድም ፤አርሶ የሚሰጡኝ መልስ ሚስጢራዊነቱ የተጠበቀ ሲሆን ከጥናት ግልጋሎት በዘለለ በእርሶ ላይ ምንም አይነት ጉዳት አያደርስም ስለዚህም ስማትን አነይዝም :: በመጠየቁ ወቅት መመለስ የማይፈለጉት ጥያቄ ካለ ያለመመለስ እንዲሁም መጠይቁ ከተጀመረ በኃላም መቋረጥ ይችላሉ:: ስለዚህ እርስዎ በዚህ ጥናት ውስጥ ለተጠየቁት መጠይቆች መልስ እንዲሰጡን በትህትና እጠይቃለሁ::

ጥያቄ አለዎት?

በጥናቱ ላይ ለመሳተፍ ተሳምምተዋል? አዎ ------   አልተስማማሁም ------

ካልተስማሙ እናመስግናለን (ወደሚቀጥለው ቤት አለፍ)

የመጠይቁ መለያ ቁጥር_____
ቀበሌ_____

የቤት ቁጥር_____

የጠያቂ ስምና ፊርማ_____

የተቆጣጣሪ ስምና ፊርማ_____

ጠቅላላ መመሪያ

ሁሉም መጠይቆች በህፃኑ እናት ቃለ ምልልስና እና በእድገት ክትትል መለኪያዎች የተመሰረቱ ናቸው:: በተጨማሪም አንዳንድ ጥያቄዎች ቅድም ኮድ የተደረገባቸው ናቸው::ምርጫዎችን ማንበብ አስፈላጊ አይደለም::የ እናቲቱን መልስ በትክክል መስማት ፤ ማክበብ እና መፃፍ ያስፈልጋል::የእናቱም ሆነ የልጁ ስም በ መጠይቁ ላይ አይፃፍም::

ሁሉም ጥያቄዎች ለህጻኑ እናት/ተንከባካቢ የሚጠየቁ ናቸው

ክፍል እንድ - የቤተሰቡን ሁኔታ የሚመለከቱ ጥያቄዎች

ቁ	ጥያቄ	ምርጫ	መረመራ/
101	የቤተሰብ አስተዳዳሪ	1. ሴት 2. ወንድ	
102	የቤተሰብ ብዛት	____	
103	ከ5 ዓመት በታች ህጻናት ብዛት	____	
104	የእናት የትምህርት ደረጃ	1. ያልተማረች 2. 1-8 ከፈል የተማረች 3. 9-12 ክፍል የተማረች 4. ዲፕሎማና ከዚያ በላይ	
105	የአባት የትምህርት ደረጃ	1. ያልተማረች 2.1-8 ከፈል የተማረች 3.9-12 ክፍል የተማረች 4.ዲፕሎማና ከዚያ በላይ	
106	የእናት ስራ	1. የቤት እመቤት 2. ገበሬ 3. ነጋዴ 4. በግል ድርጅት የምትሰራ 5. የመንግስት ሰራተኛ 6. የቀን ሰራተኛ 7. ሌላ (ይጠቀስ)	
107	የአባት ስራ	1. ገበሬ 2. ነጋዴ 3. በግል ድርጅት የምትሰራ 4. የመንግስት ሰራተኛ 5. የቀን ሰራተኛ 6. ሌላ (ይጠቀስ)	
108	ብሄር	1. ሃዲያ 2. ከምባታ 3. ወላይታ 4. ሃላባ 5. ሌላ ካለ/ይጠቀስ	

109	ሃይማኖት	1. ፕሮቴስታንት 2. ኦርቶዶክስ 3. ሙስሊም 4. ካቶሊክ 5. ሌላ (ይገለፅ)		

	ባለፈው ፩ ዓመት ከእርሻ መሬታቹ ምን አምርታችሁ ነበር	ብዛት በኩንታል(A)	በጊዜው የ ፩ ኩንታል ዋጋ(B)	አጠቃላይ ዋጋ(A*B)
110	በቆሎ			
	ጤፍ			
	ቦሎቄ/አደንጓሬ			
	ሌላ			
				ድምር

	ከተዘረዘሩት ንብረቶች የትኞቹ አሏቹ	1. አለ	2. የለም	
111	ሬዲዮ	1	0	
	ቴሌቪዠን	1	0	
	ጠረጴዛ	1	0	
	ወንበር	1	0	
	አልጋ	1	0	
	ኮሞዲኖ	1	0	
	ስልክ መደበኛ ወይም ተንቀሳቃሽ	1	0	
	የባንክ ሂሳብ	1	0	
	አህያ/በቅሎ/ፈረስ	1	0	
	የወተት ላም/ በሬ	1	0	
	ፍየል	1	0	
	በግ	1	0	
	ዶሮ	1	0	
	የንብ ቀፎ	1	0	
	የእርሻ መሬት	1	0	
	የመሬት ስፋት ከግማሽ ሄክታር በላይ ወይም ከ2 ጥማድ በላይ	1	0	

ክፍል ሁለት- የእናትየው ሁኔታ

201	የእናት እድሜ	_____	
202	የጋብቻ ሁኔታ	1. ያላገባች 2.ያገባች 3. የተፋታች 4. የሞተባት	ያላገባች ከሆነች ወደ 204
203	ሰታገቢ እድሜሽ ስንት ነበር	_____	
204	ስንት ልጆች ወልደሻል	_____	
205	በመጀመሪያው ልጅሽና በመጨረሻው ልጅ መሃል ያለው የዕድሜ ልዩነት ምን ያህል ነው	_____	
206	በእርግዝናሽ ወቅት ተጨማሪ ምግብ ትመገቢ ነበር ወይ	1. አዎ 2. አየደለም	
207	በእርግዝናሽ ወቅት የጤናሽ ሁኔታ አንዴት ነበር	1. ደህና ነበር	

		2. ታምጫ ነበር	
208	የቅድም ወሊድ ከትትል አድርገሽ ነበር	1. አዎ 2. አይደለም ————————————→	ወደ 210
209	ስንት ቅድም ወሊድ ከትትሎችን አድርገሽ ነበር	_____ ጊዜ	
210	ባለፈው ወር ወስጥ ይምግብ እርዳታ አግኝታችሁ ነበር	3. አዎ 4. አይደለም	

ክፍል ሶስት- የህፃኑ ሁኔታ

301	የህጻኑ ጾታ	1. ሴት 2. ውንድ	
302	የህጻኑ አድሜ	____ ወር	
303	በስንት ዓመት ልዩነት ነው የወለድሽው	____ ዓመት	
304	ስንተኛ ልጅሽ ነው	_____	
305	የት ነው የወለድሽው	4. ጤና ተቀም 5. ቤት 6. ሌላ ካለ ይጠቀስ	
306	ማን አዋለደሽ	4. የልምድ አዋላጅ 5. የጤና ባለሙያ 6. ሌላ ካለ ይጠቀስ	
307	በስንት ወርሽ ወለደሽ	_____ ወር	
308	ልጅሽ አንደተወለደ/ደች ኪሎ ተለክቶ ነበር	1. አዎ 2. አይደለም ————————————→	ካልተለከ 310
309	ከተለከ እንደ ተወለደ ስንት ኪሎግራም ነበር ክብደቱ?	____	
310	ኪሎው ማይታወቅ ከሆነ በግምት ምን ያህል ትልቅ ነበር??	6. በጣም ወፍራም 7. ወፍራም 8. መሀከለኛ 9. ትንሽ 10. አላውቅም	
311	መንታ ነበር የወለድሽው	3. አዎ 4. አይደለም	
312	ህጻኑ ተከትቦ ያወቃል	3. አዎ 4. አይደለም	ካልተከተብ 314
313	የወሰደው ክትባት (የህጻኑን የክትባት ካርድ አይ) ከሌለ እንዲያስታውሱ ጠይቅ) ከአንድ በላይ መልስ ይፈቀዳል	1. ቢሲጂ (ክንዳቸው ላይያለውን ጠባሳ ተመልከት) 2. ፔንታ (ስንት ጊዜ እንደወሰደ ጠይቅ) 3. ፖሊዮ(ካርድ) 4. ሚዝልስ (ካርድ ተመልከት) 5. አላውቅም	
314	በዚህ ስድስት ወር ውስጥ የቫይታሚን ኤ እንክብል ተሰጥቶት ነበር	1.አዎ 2. አልወሰደም 3. አላውቅም	
315	በዚህ ስድስት ወር ውስጥ ፀረ አንጀት ጥገኛ ተላትል	1.አዎ	

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	መደኃኒት ስጥቶት ነበር	2. አልወሰደም 3. አላውቅም	
316	ባለፈው ሁለት ሳምንት ውስጥ ህፃኑ ተቅማጥ ይዞት ነበር	1.አዎ 2. አልያዘውም ⟶	ካለታመመ 317
317	በቀን ምን ያህል ጊዜ ያስቀምጠዋል	1. አንዴ ብቻ 2. ሁለቴ 3. ከሦስት እስክ አራት ጊዜ 4. ከ አራት ጊዜ በላይ	
318	ባለፈው ሁለት ሳምንት ውስጥ ህፃኑ የማሳልና የአተነፋፈስ ችግር ነበረበት	1. አዎ 2. አልነበረበትም	
319	ባለፈው ሁለት ሳምንት ውስጥ ህፃኑ ትኩሳት ነበረው	1. አዎ 2. አልነበረውም	
320	ህፃኑ ከዚህ በፊት ኩፍኝ ይዞት ያውቃል	1. አዎ 2. አልያዘውም	
321	ባለፈው ሁለት ሳምንት ሌላ ህመም አጋጥሞት ነበር	6. አዎ 7. አሉዘውም	
322	በሁለቱም እግሮቹ ላይ ሚሰረጉድ እብጠት አለው ?(ተመልከት)	1. አዎ 2. የለም	

ክፍል አራት   የህፃኑ እንክብካቤ ሁኔታ

401	ህፃኑን ጡት አጥብተሽው ታውቂያለሽ	1. አዎ ⟶ 2. አላጠባሁትም	ወደ 403
402	ካላጠባሽ ለምን (ምክኒያቱ ይገለፅ)	--------------	
403	ህፃኑ ከተወለደ ከስንት ሰዓት በኋላ ነው ጡት የሰጠሽው	1. ወዲያው እንደተወለደ 2. ከ------ሰዓትበኋላ(ከ24 ሰዓት ካነስ ይጠቀስ) 3. ከ------ቀን በኋላ 4. አላውቅም (እርግጠኛ አይደለሁም)	
404	ልጅሽ የመጀመሪያውን የጡት ወተት ጠብቲል	5. አዎ 6. አይደለም	
405	ህፃኑ እንደተወለደ ከጡት ሌላ የተሰጠው ነገር ነበር	7. አዎ 8. አይደለም	ካልተሰጠው 407
406	ምን ነበር የተሰጠው	5. ቄቤ 6. ውሃ 7. ወተት 8. ሌላ ካለ የጠቀስ	
407	በስንት እድሜው ነው ሌላ ምግብ (ተጨማሪ ምግብ) መስጠት የጀመርሽው	_____	
408	ከጡት ሌላ ህጻኑን ምን ትመግቢዋለሽ	7. ገንፎ 8. ሙቅ 9. ወተት 10. ፈራፍሬ 11. ከቤተሰቡ ጋር እንድ አይነት ምግብ 12. ሌላ ካለ ይጠቀስ	

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409	በቀን ምን ያህል ጊዜ ትመግቢዋለሽ	5. 1-2 ጊዜ 6. 3 ጊዜ 7. 4 ጊዜ 8. ከ 4 ጊዜ በላይ	
410	ልጅሽን በምን ዕቃ ነው የምትመግቢው	1. በጡጦ 2. በኩባያ 3. በማንኪያ 4. ሌላ------ይገለፅ	
411	ለምን ያህል ወራት ጡት አጠባሽው	_____	
412	ሁሌ ህጻን ከመመገብሽ በፊት እጅሽን ትታጠቢያለሽ?	1. አዎ 2. አልታጠብም	
413	የህፃኑን ሰውነት የምታጥቢው በስንት ቀን ነው	1.በየቀኑ 2. በሳምነት 3. ሌላ(ይገለፅ)	
414	ህፃኑን ማነው ሚንከባከበው	1. እናቱ 2. አያቱ 3. እህቱ 4. የቤት ሰራተኛ	

ክፍል አምስት-የቤተሰብ ምግብ ዋስትና መለኪያ

501	ባለፈው ወር በቂ ምግብ ቤት ውስጥ አይኖርም ብለሽ ተጨንቀሽ ነበር?	1. አዎ 2. አልሰጋሁም	....⌴
501 a.	አዎ ከሆነ ለ501 መልሰሽ በወር ውስጥ ምን ያህል ጊዜ?	1. በጣም ትንሽ ጊዜ (አንዴ ወይ ሁለቱ) 2. አንዳንዴ(3-10 ጊዜ) 3. ሁል ጊዜ(ከ አስር ጊዜ በላይ)	....⌴
502	በምግብ ወይም በገንዘብ እጥረት ምክንያት አንቺ ወይም በቤተሰብ ውስጥ የመረጣቹትን ምግብ መመገብ ያልቻላቹት ጊዜ ነበር?	1. አዎ 2. የለም	....⌴
502.a	አዎ ከሆነ መልሱ ለ502 ለምን ያህል ጊዜ?	1. በጣም ትንሽ ጊዜ (አንዴ ወይ ሁለቱ) 2. አንዳንዴ(3-10 ጊዜ) 3. ሁል ጊዜ(ከ አስር ጊዝ በላይ)	....⌴
503	ባለፈው ወር (አራት ሳምንት) ውስጥ የመገዛት አቅም ስላልነበራችሁ በቤተሰብ ውስጥ የተወሰነ የምግብ አይነት ብልታቹ ነበር?	1.አዎ 2. የለም	....⌴
503.a	አዎ ከሆነ መልስሽል 503 ለምን ያህል ጊዜ?	1. በጣም ትንሽ ጊዜ (አንዴ ወይ ሁለቱ)	....⌴

| | | 2. አንዳንዴ(3-10 ጊዜ) |
| | | 3. ሁል ጊዜ(ከ አስር ጊዜ በላይ) |

504	ባለፈው አራት ሳምንታት ውስጥ ምግብ ስላነሰ ወይም ገንዘብ ስለሌለ የማትፈልጉትን ምግብ ተመግባቹ ነበር?	1.አዎ 2. አልነበርም	....└┘
504.a	አዎ ከሆነ ለ504 ለምን ያህል ጊዜ	፩. በጣም ትንሽ ጊዜ (አንዴ ወይ ሁለቴ) 2.አንዳንዴ(3-10 ጊዜ) 3.ሁል ጊዜ(ከ አስር ጊዜበላይ)	....└┘
505	ባለፈው ወር ቤት ውስጥ በቂ ምግብ ስለሌለ ከሌላው ጊዜ ያነሰ ምግብ የተመገበ ሰው አለ?	1. አዎ 2. የለም	....└┘
505.a	አዎ ከሆነ መልሰሽ ለ 505ምን ያህል ጊዜ?	1. በጣም ትንሽ ጊዜ (አንዴ ወይ ሁለቴ) 2. አንዳንዴ(3-10 ጊዜ) 3. ሁል ጊዜ(ከ አስር ጊዜ በላይ)	....└┘
506	ባለፈው ወር ውስጥ በቂ ምግብ ስለሌለ በቀን ውስጥ በጣም ትንሽ ምግብ የተመገባቹበት ቀን አለ?	1. አዎ 2. የለም	....└┘
506.a	ካለ(506) ለምን ያህል ጊዜ?	1. በጣም ትንሽ ጊዜ (አንዴ ወይ ሁለቴ) 2. አንዳንዴ(3-10 ጊዜ) 3. ሁል ጊዜ(ከ አስር ጊዜ በላይ)	....└┘
507	ባለፈው ወር ውስጥ ምንም አይነት ምግብ ቤት ውስጥ ሳይኖር ቀርቶ ያውቃል (ገንዘብ ስለሌሴ)?	1.አዎ 2. አያውቅም	....└┘
507.a	አዎ ከሆነ (507)ለምን ያህል ጊዜ?	1. በጣም ትንሽ ጊዜ (አንዴ ወይ ሁለቴ) 2. አንዳንዴ(3-10 ጊዜ) 3. ሁል ጊዜ(ከ አስር ጊዜ በላይ)	....└┘
508	ባለፈው ወር ውስጥ ምግብ ስለሌሴ ከቤተሰብ ሃይበላ ያደረ አለ?	1. አዎ 2. የለም	....└┘
508.a	አዎ ከሆነ (508) ለምን ያህል ጊዜ?	1. በጣም ትንሽ ጊዜ (አንዴ ወይ ሁለቴ) 2. አንዳንዴ(3-10 ጊዜ) 3. ሁል ጊዜ(ከ አስር ጊዜ በላይ)	....└┘
509	በቤተሰብ ውስጥ በምግብ እጥረት ምክንያት ባለፈው ወር ውስጥ ቀንና ማታ ምንም ምግብ ሳይበላ ያሳለፈ ሰው አለ ?	1. አዎ 2. የለም	....└┘

	አዎ ከሆነ (509)ለምን ያህል ጊዜ?	1. በጣም ትንሽ ጊዜ (አንዴ ወይ ሁለቴ) 2. አንዳንዴ(3-10 ጊዜ) 3. ሁል ጊዜ(ከ አስር ጊዜ በላይ)	....|__|
509.a			

ክፍል ስድስት- የአካባቢያዊ ሁኔታዎች

	የመጠጥ ውሃ ከየት ነው ምታገኙት	1. ከቧንቧ (ከግል) 2. ከጉርጓድ 3. ከቦኖ(ከ ህዝብ) 4. ሌላ------------- የጥቀሱ	
601			
602	ምን ያህል ውሃ በቀን ትጠቀማላችሁ	_____ሌትር	
603	ሽንት ቤት አላችሁ	1. አዎ 2. የለንም	ከሌለ ወደ 605
604	የሽንት ቤት አይነት (ተመልከት)	1. ዘመናዊ የግል ሽንት ቤት 2. ባህላዊ የግል ሽንት ቤት 3. የጋራ ሽንት ቤት 4. ሌላ (ይጠቀስ)	
605	የቤት ውስጥ ቆሻሻዎችን (ጥራጊዎችን)የት ነው ምትጥሉት	1. ሜዳ ላይ 2. ጉድጓድ ውስጥ 3. ውጭ እናቃጥላለን 4. ሌላ --------------	
606	የመኖሪያ ቤቱ አይነት	4. ጎጆ ቤት 5. ቆርቆሮ ቤት 6. ሌላ ካለ የጠቀስ	
607	የቤት እንሰሳ ካላችሁ ለእነርሱ የተለየ ማደሪያ አለቸው	1. አዎ 2. የላቸውም	

ክፍል ሰባት- የህጻኑና የእናትየዉ ክብደትና ቁመት ልኬት

ቁ	ልኬት		ምርመራ
701	ህፃኑ የተወለደበት ቀን ቀን/ወር/ኣ.ም)		
702	የህፃኑ ክብደት(በ ኪ.ግ)		
703	የህፃኑ ቁመት(በ ሴ.ሜ)		
704	የእናቱ ክብደት(በ ኪ.ግ)----------------		
705	የእናቱ ቁመት(በ ሴ.ሜ)----------------		

Jimma universitee

Minadab feya'oomaa sayins kollegi

Epidemiology lessanchi qodoo

Misraq badawachi woradanne 5 hinchi woron yoo cilluwa hurbat bikkinaa abaross hurbaxx bikkina baxxakami naqashin gudisakko xamichuwwa

Xumi getka'a/hosseka ann------------------------yemamomo jimma universiteen epidemiology lem digree losanch baxoo neqashane maraj wixxa'omanne. neqashim ille isukok cilluw hurbaxinee abaross hurbaxx bikinanette.

Ebikinn ness kin mat mat xamichuw xaminen hansomula. Ki'n uwitakam dabach ka xinatin awadimins higaa ka hawonn baxxo mangista bikkanaoo annan annann dirigituwinam awadakko. Xamichim 30 daqiqins higoyyoo. K'in inna uwitkkam dabach ayim laoyyo oddim misxirinette amadakamok ebikkinam kin sum amadamoyyoo. Dabataken hassakkam bee'e xamich yoolassi higaken xantakkamoo oddim xamich dabarim jamatakaa lasege urimam xantakkaamoo. xamittaken hassakam luchi he'a? Kabaa ka xinattanee tababataken hassakam?

Tesmama'amo_____   tesma'amamoyyoo_____

Tesma'amamubelass galaxitta(higa yoo min mare)

_____

qabalee_____

Mine xiggo_____

Xemanchik summ_____

Supelvayzelek summ_____

Hundim xamichuw cilich ammm uwitam dabachine kenettine sidamuk marajainne asheremakkoanne. Mat mat xamichuw oddim illag kod uwwamakko hanne. Ebikin dabachuw qananaim hasissoyyo. Ammak dabach denamiss macessekka lassage kitabim hassissokko.cilichikam ihuk amak sum kitabamoyyo.

Hundim xamichuw cilich amman xamakamannee.

Baxxanchi matto: - abaross bikkin xamakkam xamichuwaa

xig	xamicha	doillancha	higonna
101	Min anich	3. goncho 4. landicho	
102	Abaros xig	_____	
103	5 hinchi woron yoo cciluwwi me'o	_____	
104	Amak lossan gabala	5. tematto be'ek 6. 1-8 7. 9-12 8. Koleegins hannan	
105	Ann lossan gabala	5. Tematto be'ek 6.1-8 7.9-12 8.Kolegins hanan	
106	Amm baxx ogorra	8. Min ammatte 9. abulanchi 10. dederanchi 11. gag dirjit baxanchotte 12. addil bexanchotte 13. Bel bexanchotte 14. Mulek yolass	
107	Ann baxx ogorra	7. abullanchotte 8. dederanchi 9. gag dirjit baxanchotte 10. xdil bexanchotte 11. Bel bexanchotte 12. Mulek yolass	
108	zara	6. hadiya 7. kembata 8. wolayita 9. halaba 10. mulek yollas	

109	Haymanotta	6. amnano 7. ortodox 8. islam 9. katolik 10. mulek yolass		
	Higuk 1 hinchone ki ulins maha fisitekaa	**Maa qaxaa(A)**	**1 kuntalek isaba(B)**	**Edemuk isaba(A*B)**
	beqol			
110	xaffe			
	boloqee			
	muleka			
				Eddansa_____
	Woron yoo mu'utins kin minee yoo hinkanee	**1. yokko**	**2. be'ee**	
	radio	1 1	0	
	televisinaa	1	0	
	xarapheza	1	0	
	barchuumaa	1	0	
	alga	1	0	
	madardaree	1	0	
111	Silka mobayilam ihuk mi'neka	1	0	
	Bank dabtar	1	0	
	Halich/baquch/farasho	1	0	
	Add say/harqota	1	0	
	felakicho	1	0	
	gerechoo	1	0	
	antaba	1	0	
	Dishicho	1	0	
	Harqotakam ulli	1	0	
	Ullik hararoma 2 ximmadins hannaan	1	0	

Baxxanchi lammo:-amma bikkina guduk xamichuwaa

201	Ammak ummur	_____	
202	Min issaka mogorra	1. bajamee 2.min isitoik 3. bubesancho 4. manchi lehukoki	Bajame ikoa 204
203	Ebentoaree ki ummur me'o	_____	
204	Me.ee cillich qeta	_____	
205	Lob betine hofanone yo'o umuur ammane me'I ihoo	_____	
206	At ka cilich lamforr ikka hurmat edda itahiinhe	1. eya 2. a'ee	
207	At ka cilich lamforr ikka fayya'om hinkid ihukoo?	1. denamm ihukko	

		2. xissa he'ukko	
208	Lamfor ikka mirmarainna hakim matta?	5. eyya 6. a'ee ———————	xamicha 210
209	Me'ee amman matta	_____amman	
210	Higu agana hurbat irdatta sixitake'aa	7. eyya 8. a'ee	

Baxxanchi sasso:-cilichi bikkin guduk xamichuwaa

301	Landichoni goncho	1. landicho 2. goncho	
302	Cillich ummur	_____ aganna	
303	Lobanins me'inn hoffe'o	_____ hincho	
304	Me'anne	_____	
305	Hanno qatitoo	7. faya'omm minne 8. mineni 9. mulek yolass	
306	Aye qasisukoo	7. sefal ammuwa 8. hakimmuwa 9. mulek yolass	
307	Me'ee agananette qatitoo	_____aganane	
308	Cilich qarakamaree kenema'inihe?	1. eyya 2. a'ee ⟶	xamicha 310
309	Kenamukarre me'ee killo ihukkoo?	_____	
310	Kenamu be'aree gimitinne hinkann ihoo??	11. Danamiss orachamoo 12. orachamoo 13. danammoo 14. hoffanne 15. la'umoyyo	
311	qaffani	5. eyya 6. a'ee	
312	Cilich kitibax aa'aa la'oo	5. eyya 6. a'ee	ካልተከተብ 314
313	Aa'ukki kitibax mahaa(kard he'ukka mo'ee) be'ukkare tirakamisin xamme. Mati hannan dabach xanamokko	6. BCG (anganno yo'I boroq mo.ee) 7. penta(me'ee amanee aa'ukko) 8. polio(kaard)) 9. mizilla(kard mo'ee) 10. la'ummoyoy	
314	Ka 6 aganane vitamin a kitibaxx a'aa la'oo	1.eyya 2. a'ee 3. la'om0yyo	

315	Ka 6 aganane godab qararre a'aa la'oo	1.eyya 2. a'ee 3.la'umoyya	
316	Higu 2 santanne cilichin afussa la'onne	1.eyya 2. a'ee ⟶	xamicha 317
317	Balan me'ee amma affusso	1. 1 amman 2. 2 amman 3. 3-4 affebe'ee 4. 4 hannan	
318	Higu 2 santanne cilichin kuxissa la'oo	1. eyya 2. a'ee	
319	Higu 2 santanne cilich ibissa la'oo	1. eyya 2. a'ee	
320	Cilich kanni ilag kufign amada la'oo	1. eyya 2. a'ee	
321	Higu 2 santanne mull jab ammada la'oo	1. eyya 2. a'ee	
322	Lamomm lokkonne dishukkis (mo'ee)	1. eyya 2. be'ee	

Baxxanchi sorro:-cilich hurbax bikkina gudu xamichuwaa

401	Cilich annun icissaa laqohinihe	1. eyya ⟶ 2. A'ee	403
402	Icisube'arre (mahinatte)	---------------	
403	Qarama lassage mah amaninette icissim ashetitok	1. qaramukkisam 2. _____sa'ati lassage(24 worron ihukaa xafamona) 3. 4. -----------ball lassage 5. La'ummoyyo(tisisomoyya)	
404	Cilich ilag firuk add icainehe	1. eyya 2. a'ee	
405	Cilich qaramukissam anunins mullek ituk luch he'aa	3. eyya 4. a'ee	ካልተሰጠው 407
406	Mahha uwamukkoki	1. burro 2. wo'o 3. ashicho 4. mulek yolass	
407	Me'ee aganinette mulli hurbat itisim jamatitok	_____	
408	Anunis mullek maha itiss0	1. tirsho 2. lanqo 3. ashicho 4. firafireuwwi	

		5. abarossine mat aynat hurbat 6. mulek yolass	
409	Balanne me'ee amma itisso	1. 1-2 amman 2. 3 amman 3. 4 amman 4. 4 hanann amman	
410	Maha mu'utinne itisso	1. Xuxo'inne 2. kubayyainne 3. manke'inne 4. mulek yolass	
411	Me'ee aganin anun icisito	_____	
412	Hund amman cillich itisson gasita anga anshaqitto?	1. eyya 2. a'ee	
413	Cillich orach maha balinette anshaqitto	1.bala balanee 2. santanne 3. Mulek yolass	
414	Cillich itissokokki ayyette	1. amma 2. ammama/annamma 3. ayiwa 4. min awadanchi	

Baxxanchi onto:-abaross hurbax bikkina guduk xamichuwaa

501	Higu 1 aganane ihoo hurbat minen he'oyyo yitta ceneqenta laqoo?	1. eyya 2. a'ee	....|___|
501 a.	501 ina Eyya yitlass agannane hinkan ammaninna?	1. Hoff amanina(1 te 2) 2. Mat mat amman(2-10 ammane) 3. Hund ammane(10 mins hannane)	....|___|
502	Hurbat beiminne te'im dinat be'e bikinn att te'im abarasins mull mann kinnuw hassakko hurbat itakken xantakobee ball he'aa?	1. eyya 2. a'ee	....|___|
502.a	502 ina Eyya yitlass agannane hinkan ammaninna?	1. Hoff amanina(1 te 2) 2. Mat mat amman(2-10 ammane) 3. Hund ammane(10 mins hannane)	....|___|
503	Higu agan woron bitalekken aqim bebikin hoffo hurbat itekka laqakkam?	1. eyya 2. a'ee	....|___|
503.a	503 ina Eyya yitlass agannane hinkan	1. Hoff amanina(1 te 2)	....|___|

	ammaninna?	2. Mat mat amman(2-10 ammane) 3. Hund ammane(10 mins hannane)	
504	Higu 1 aganane hurbat hofe'u bikkin te'im dinat bebikin hassakam be'e hurbat itaka'a laqakam?	1. eyya 2. a'ee	....|___|
504.a	504 ina Eyya yitlass agannane hinkan ammaninna?	1. Hoff amanina(1 te 2) 2. Mat mat amman(2-10 ammane) 3. Hund ammane(10 mins hannane)	....|___|
505	Higu 1 aganan hurbat be'e bikkin mull amanins hoffe'akko hurbat itukk man he'aa.	1. eyya 2. a'ee	....|___|
505.a	505 ina Eyya yitlass agannane hinkan ammaninna?	1. Hoff amanina(1 te 2) 2. Mat mat amman(2-10 ammane) 3. Hund ammane(10 mins hannane)	....|___|
506	Higuk 1 aganane ihoo hurbat be'ee bikinn balan hoffok hurbat ittekka leqakkam?	1. eyya 2. a'ee	....|___|
506.a	506 ina Eyya yitlass agannane hinkan ammaninna?	1. Hoff amanina(1 te 2) 2. Mat mat amman(2-10 ammane) 3. Hund ammane(10 mins hannane)	....|___|
507	Higu 1 aganane min woro maham itakam luchi be'aa la'oo.	1. eyya 2. a'ee	....|___|
507.a	507 ina Eyya yitlass agannane hinkan ammaninna?	1. Hoff amanina(1 te 2) 2. Mat mat amman(2-10 ammane) 3. Hund ammane(10 mins hannane)	....|___|
508	Higuk 1 aganane hurbat be'ee bikin aborossins iton garuk monchi he'aa.	1. eyya 2. a'ee	....|___|
508.a	508 ina Eyya yitlass agannane hinkan ammaninna?	1. Hoff amanina(1 te 2) 2. Mat mat amman(2-10 ammane) 3. Hund ammane(10 mins hannane)	....|___|
509	Higu 1 aganane hurbax be'ee bikinn balam	1. eyya 2. a'ee	....|___|

	himom iton higisuk manchi he.aa ?		
509.a	509 ina Eyya yitlass agannane hinkan ammaninna?	1. Hoff amanina(1 te 2) 2. Mat mat amman(2-10 ammane) 3. Hund ammane(10 mins hannane)	....|___|

Baxxanchi lohoo:-hegeq bikkina guduk xamichuwa

601	Agakam wo'I haninse sixixakamoo	1. Bonba 2. balins 3. bonoinse 4. muleka	
602	Balan hinkan wo'o awaxitakam	_____litira	
603	Shum min he'aa	1. eyya 2. be'ee	Be'ukka xamicha 605
604	Shum min mah labbo(mo'e)	1. danamiss baxamakko gaqi shumi mine 2. gaqi shumi mine 3. mull maninne awaxakam shum minee 4. muleka yollass	
605	Mini firro qoshash hanoo unjitakkamo	1. gogonne 2. ballen 3. girimma 4. muleka --------------	
606	Mine hinkidonehanne	1. huq minee 2. qorqoro 3. mulekka	
607	Lallew yolass lalewin annan min he'aa	1. eyaa 2. be'ee	

Baxxanchi:- cilichikka amakkaa kennatto

xigo	kennato		
701	Cilich qaramu bella (balla/agana/H.D)		
702	Cilich killo kennat(k.g)		
703	Cillich ullich kennat(c.m)		
704	Amma killo kennat(k.g)		
705	Amma ullicha(c.m)		