PREVALENCE OF HOUSEHOLD FOOD INSECURITY AND ITS ASSOCIATION WITH NUTRITIONAL STATUS OF CHILDREN AGED 6-59 MONTHS IN HOSSANA TOWN, HADIYA ZONE, SOUTHERN ETHIOPIA

By: KIDIST DANIEL (BSc)

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Jimma Ethiopia

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By

KIDIST DANIEL (BSc)

Advisors:

1. PROFESSOR TEFERA BELACHEW (MD, Msc, PhD)

2. Mr. CHERNET HAILU (CN, Dip.MCH, BSN, MPH)

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Jimma, Ethiopia

ABSTRACT

Back ground: Food insecurity and consequent malnutrition are major barriers to development in Ethiopia. High malnutrition rates in the country pose a significant obstacle to achieving better child health outcomes. This study tried to explore the prevalence of household food insecurity and malnutrition among children aged 6 to 59 months, as well as the association between these two factors.

Objective: To assess the prevalence of household food insecurity and its association with nutritional status of children aged 6-59 months in Hosanna Town, Hadiya zone.

Methods: A cross sectional study design was employed to assess prevalence of household food insecurity and nutritional status of children in Hossana Town. 414 study subjects were involved in the study. Before data collection list of households with eligible children were identified from HEWs data and proportionate to sample size allocation was employed to each kebele. Sample households were selected from each kebele using systematic random sampling method by calculating the sampling interval k=4. The data were entered; cleaned and analyzed using SPSS Version 16.Anthropometric data were entered in WHO anthro software version 3.2.2.The data were analyzed by descriptive statistics; Bivariate and multivariable logistic regression were done to see the association between dependent and independent variables.

Results: The result of this study shows 8% of children are wasted, 14.4 % were underweight and 43.3 % were stunted. Prevalence of Household food insecurity was 79.1 %. Household food insecurity was associated with underweight. Child age and child sex were associated with stunting. Large family size and diarrhea in the last two weeks preceding the survey were associated with wasting and underweight respectively.

Conclusions: Household food insecurity and Malnutrition as measured by underweight, wasting and stunting was high in Hossana Town. Household food insecurity was associated with underweight, but not significantly associated with stunting and wasting. Intervention initiatives should focus on improving household food insecurity and nutritional status.

Key words: stunting, wasting, underweight and food insecurity

ACKNOWLEDGMENT

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ACRONYMS

ANC	Antenatal Care
BCG	Bacillus Calmette-Guérin
BMI	Body Mass Index
CI	Confidence Interval
Cm	Cent Meter
EDHS	Ethiopian Demographic Health Survey
FP	Family Planning
HAZ	Height for Age Z score
HEWs	Health extension workers
HFIAS	Household Food Insecurity Access Scale
HH	Household
Kg	Kilogram
MDGs	Millennium Development Goals
OR	Odds Ratio
SD	Standard Deviations
SNNPR	Southern Nation and Nationality Peoples Region
UNICEF	United Nations Children Fund
USDA	United States Department of Agriculture
WAZ	Weight for Age Z- score
WHO	World Health Organization
WHZ	Weight for Height Z- score

CHAPTER ONE

INTRODUCTION

1.1 Background information

Ethiopia is the second-most populous country in Africa, at nearly 84 million. Approximately 14% are children under five years of age. These children and their mothers suffer disproportionately from the poor health and nutrition situation in the country. In fact, malnutrition is the underlying cause of 57% of child deaths in Ethiopia, with some of the highest rates of stunting and underweight in the world (1).

Malnutrition is a physical condition or process that results from the interaction of inadequate diet and infection and is most commonly reflected in poor infant growth; reduced cognitive development, anemia, and blindness in those suffering severe micronutrient deficiency; and excess morbidity and mortality in adults and children alike. Under nutrition and over nutrition are two forms of malnutrition. Under nutrition is malnutrition due to inadequate food consumption or poor absorption or biological use of nutrients consumed due to illness, disease, or nutrient imbalances (2).

Stunting reflects failure to receive adequate nutrition over a long period of time and is affected by recurrent and chronic illness. Height-for-age, therefore, represents the long-term effects of malnutrition in a population and is not sensitive to recent, short term changes in dietary intake (3).

Wasting reflects failure to receive adequate nutrition either due to inadequate food intake or due to illness. The weight-for-height index measures body mass in relation to body height or length it describes current nutritional status(3).

A child can be underweight for his/her age because he or she is stunted, wasted, or both. Weight-for-age is an overall indicator of a population's nutritional health (3).

Child malnutrition as poverty indicator is a comprehensive indicator which is reflective and indicative of other desirable outcomes of development i.e. improvement in gender empowerment, intra-household distribution and equality, and health environment quality (4).

Nutritional status is the best global indicator of well-being in children. Child malnutrition is also an important indicator of monitoring progress towards the Millennium Development Goals (MDGs); to reduce by 2015, child malnutrition of age under five years by half, with special attention to children under two years of age (5).

Good nutrition is the cornerstone for survival, health and development for current and succeeding generations. Well-nourished children perform better in school, grow into healthy adults and in turn give their children a better start in life. Undernourished children have lowered resistance to infection; they are more likely to die from common childhood ailments like diarrheal diseases and respiratory infections, and for those who survive, frequent illness saps their nutritional status, locking them into a vicious cycle of recurring sickness and faltering growth (6).

Food insecurity and consequent malnutrition are major barriers to development in Ethiopia. There are three main components of food security -availability, access and utilization - and all three contribute to the ongoing crisis situation in Ethiopia (2).

A household is said to be food secured "if it can reliably gain access to food in sufficient quantity and quality for all household members to enjoy a healthy and active life" (7).

Nutrition and food safety are interdependent components of public health and concern everybody. Poor nutrition can lead to reduced immunity, impaired physical and mental development and reduced productivity (8, 9). According to USDA classification, a report of World Bank documented the different levels of household food security status as follows (10):

1) Food secure: These households had access, at all times, to enough food for an active, healthy life for all household members.

2) Food insecure: At times during the year, these households were uncertain of having, or unable to acquire, enough food to meet the needs of all their members because they had

insufficient money or other resources for food. Food-insecure households include those with low food security and very low food security.

2.1 Low food security (without hunger): These food-insecure households obtained enough food to avoid substantially disrupting their eating patterns or reducing food intake by using a variety of coping strategies, such as eating less varied diets, participating in Federal food assistance programs, or getting emergency food from community food pantries (10).

2.2) Very low food insecurity (with hunger): In these food-insecure households, normal eating patterns of one or more household members were disrupted and food intake was reduced at times during the year because they had insufficient money or other resources for food. In reports prior to 2006, these households described as "food insecure with hunger" (10).

1.2 Statement of the problem

Worldwide, malnutrition and specific nutrient deficiencies are the leading underlying cause of immune deficiency, leading to infections and other diseases. Of the 13-14 million children dying each year in developing countries, 70 percent die of infectious diseases and most are malnourished (12).

Under nutrition contributes to more than a third of under-five deaths globally. It has many short- and long-term consequences, including delayed mental development, heightened risk of infectious diseases and susceptibility to chronic disease in adult life (6).

In low-income countries, child under nutrition is likely to be a consequence of poverty, characterized as it is by low family status and income, poor environment and housing, and inadequate access to food, safe water, guidance and health care. In a number of countries, stunting is equally prevalent, or more so, among the poorest children in urban areas as among comparably disadvantaged children in the countryside (6).

In developing countries, child under nutrition remains a major public health concern. Both a manifestation and a cause of poverty, it is thought to contribute to over a third of under-five deaths globally. Insufficient nutrition is one of a wide range of interlinked factors forming the poverty syndrome – low income, large family size, poor education and limited access to food, water, sanitation and maternal and child health services(13).

A sharp regional shift in the location of child malnutrition is projected; South Asia's share of total numbers of children will fall from 51% to 47%, but sub-Saharan Africa's share will rise from 19% to near 35 % (6).

Much of the burden of deaths resulting from malnutrition, estimated to be over half of childhood deaths in developing countries, can be attributed to just mild and moderate malnutrition, varying from 45% for deaths due to measles to 61% for deaths due to diarrhea (13).

The highest level of stunting is found in Eastern Africa, where, on average, 48% of Pre-school children are currently affected. In this region, stunting has been increasing at 0.08 percentage

points per year. In sub-Saharan Africa the absolute numbers of malnourished children are expected to be increasing to 128 million under an optimistic scenario, in which improvements in the determinants is accelerated, by 2020 (14).

In Ethiopia under five children constitute about 14% of the total population (1). They are the most vulnerable group with high morbidity and mortality (88/1000 live births) mainly due to infection and malnutrition (3). Food insecurity and malnutrition are common among children in southern nation and nationality peoples region (SNNPR). According to Ethiopian Demographic Health Survey (EDHS), the prevalence of stunting in SNNPR is 44.1% (below -2SD height for age z-score) (3). study conducted in shone district shows about 10.4%, 42.8% and 75.6% children were wasted, underweight and stunted, respectively (15).

Household food insecurity can negatively affect food consumption including reduced dietary variation and nutritional status of household members (3).

Healthy child growth and development is the basis of human development. The impact of malnutrition is multifarious. It has an all-pervasive impact on the physical well-being and socioeconomic condition of a nation. It perpetuates poverty through direct losses in productivity, indirectly losses from poor cognitive function, poor child development and deficits in schooling and losses due to increased health costs (13).

Undernourishment not only reduces productivity and increases susceptibility to illness; it also reduces the individual's ability to utilize nutrients, creating a downward spiral of hunger, disease and poverty (11).

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 (16, 17).

Household food insecurity has two broad components: insufficient access to a nutritionally adequate and safe food supply at the household level, and inadequate utilization of these foods by household members (17).The access component is also believed to comprise three core domains: anxiety and uncertainty about household food supply, insufficient quality of food, and

insufficient food intake by household members (18). The utilization component is influenced most immediately by nutrition knowledge and beliefs, but also by access to healthcare, water, and sanitation services and practices relating to the management of childhood illness and hygiene (16, 17).

The causes of household food insecurity may include inadequate control and quality of assets (including land), unemployment, underemployment or inadequate wages, high food prices, inadequate access to markets and other factors (19). The ability of a household to command adequate food resources - through self-production or market transactions - is primarily dependent upon assets and/or income. In agrarian societies, land ownership has been shown to be a sensitive indicator of wealth, and studies have indicated that under nutrition is associated with the lack of such a productive asset, and/or low effective income (20).

Markets play an important role for many households in Ethiopia to access food and sell surplus. Based on the household economic analysis baseline studies, it was estimated that about 48 percent of rural households are net-buyers. The western half of the country and south-central Oromia is generally a surplus area, while pastoral areas but also parts of the north-east, east and central cropping areas in the central highlands are generally deficit areas. In case of rising food prices, urban households and net-buying households in rural areas are particularly vulnerable (21).

Household food insecurity has been associated with several health and nutrition outcomes in both developed and developing countries. By negatively affecting food consumption, either through reduced quality or quantity of food, or potentially worsen nutritional status. Food insecurity may also affect nutritional status through its effects on stress, depression, parenting, and infant feeding (22).

However, the relationship between household food insecurity and nutritional status of adults and children, particularly in developing countries, is not well known. In developed countries, household food insecurity has been associated with overweight and obesity among adults, particularly women, but not all studies have reported this relationship (23).

The prevalence of household food insecurity as well as the prevalence of malnutrition among 6-59 months of children in is not known in Hossana Town. Also the association between these two factors is not known. Accordingly, this study will explore the prevalence of household food insecurity and malnutrition among children aged 6 to 59 months, as well as the association between these two factors, in Hossana town, Hadiya Zone Southern Ethiopia

CHAPTER TWO

LITERATURE REVIEW

2.1 Nutritional status of children

Nutritional status is the result of complex interactions between food consumption and the overall status of health and health care practices. Numerous socioeconomic and cultural factors influence patterns of feeding children and the nutritional status of women and children (3).

Nutrition and food safety are interdependent components of public health and concern everybody. Poor nutrition can lead to reduced immunity, impaired physical and mental development and reduced productivity (15, 24). Thus, malnutrition occurs when an individual's diet does not provide adequate calories and protein for growth and maintenance, or if they are unable to fully utilize the food they eat due to illness (24).

Children are vulnerable to the consequences of food insecurity and malnutrition because of their physiology and high calorie needs for growth and development. Malnutrition is the underlying cause of death of more than 2.6 million children each year, a third of under-five deaths, and a third of total child deaths worldwide (25).

The United Nations Standing Committee on Nutrition 5th report describes malnutrition as the largest single contributor to disease, taking a particularly severe toll on preschool children. One in three developing country preschoolers – 178 million children under the age of five – suffers from stunting as a result of chronic malnutrition. Eighty percent of these children live in just 20 countries in Africa and the Asia Pacific region (27).

Ethiopia, Nigeria and the Democratic Republic of the Congo account for 40% of all the stunted preschoolers in Africa; hence, any effort to reduce the level of chronic malnutrition on the continent must target these countries. The July 2012 executive brief of the Food and Agriculture Organization of the United Nations on the acute food crises in the Sahel region of West Africa, estimated that about 1 million children under the age of five are at risk of severe acute malnutrition (36). Underweight and stunting rates among young children are highest in

Ethiopia. About two in five children 29% are underweight (9% are severely underweight), overall 10% of the children are wasted (2% are severely wasted) and 44% of the children are stunted that half of them are severely stunted (3).

2.2 Household food insecurity level

A study conducted in Bangladesh showed more households affirmed consuming lower-quality food (55.3 %) more often than worrying about their food supply (36.3 %) (34). A study conducted in Tanzania using the HFIAS revealed that 79.3 % were food insecure more than 50% of the households experienced some degree of food insecurity with 34.5% reporting child hunger (29). Study conducted in Nepal using a short version of HFIAS shows 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 (30). 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 (30). A study on coping strategies conducted in South Africa also showed that 74 % of respondents limited their variety of food, limited portion size (80 %) or skipped meals (68 %) (35).

Study conducted in Ethiopia Sidama Zone taking the overall figure computed from the HFIAS, about 82.3 % of the households were facing mild to severe food insecurity (23).Also study conducted in Hadiya Zone Shone town shows Nearly all (98.5%) respondents reported that the food runs out before they get money, and 92% experienced hunger (15).

2.3 Factors associated with nutritional status of children

Household food insecurity and nutritional status of children

A study conducted in Antioquia, Colombia with a sample of 2 784 low-income households with preschool children, Data which was reviewed on Stunting or risk of stunting which accounts 42% as well as underweight or risk of underweight which accounts 37.5%, showed a statistically significant inverse association with household food security status: the more food insecure the household, the higher the prevalence of stunted or risk of stunted and underweight

or risk of underweight children. In contrast, wasting and risk of wasting did not show a significant association with food security status (31).

Study conducted in Nepal shows the overall prevalence of stunting, underweight and wasting among children were 41.4%, 24.2% and 9.2% respectively. The prevalence rates of stunting and underweight were slightly higher among children from food-insecure than among children from food-secure households and household food insecurity was not associated with stunting or underweight among children (30).

The study conducted in Ethiopia Gerakeya and Lolamama district on nutritional status of children aged 6-59 months of age in food insecure households used cross sectional study design with descriptive and analytic components to estimate malnutrition rate on food insecure households. The overall prevalence of stunting, underweight and wasting was 54.2%, 40.2% and 10.6 %, respectively. A higher rate of stunting which is a direct reflection of chronic poverty was found in Lolamama. Large family size and absence of additional income were also correlated with percent stunted and underweight (22).

A study conducted in north showa zone Gumbrit on assessment of nutritional status of preschool children used cross sectional study design with a total sample size of 450. The levels of underweight, wasting and stunting were 28.5%, 17.7%&24% respectively. Family income was significantly associated with under five children (23).

Child characteristics

Age of child

According to EDHS 2011 the prevalence of stunting increases as the age of a child increases, with the highest prevalence of chronic malnutrition found in children age 24-35 months which accounts 57 % and lowest in children under age six months 10%. The proportion of underweight children is highest in the age groups 24-35 months which accounts 34 % and lowest among those under six months 10 percent. Wasting, or acute malnutrition, is highest in

children age 9-11 months (19 %) and lowest in children age 36-47 months (6 %) (3). A study conducted in West Gojam Zone showed that the likelihood of being stunted was highest for age group 13-24 months, while the lowest was observed for age group 37-59 months (41).

Sex of the child

Male children are slightly more likely to be stunted than female children (46 % and 43 %, respectively) and slightly more likely to be wasted (11 %) than female children (8 %) (3). Most cross-sectional studies in developing countries have shown that female children are at higher risk of stunting than male children (43). Studies showed boys are more malnourished than girls (42). The study conducted in West Gojam Zone revealed that male children face nutritional disadvantages as compared to female children (41).

Birth weight

Size at birth is an important indicator of a child's nutritional status. Babies reported as very small or small at birth are much more likely to be underweight later in life (39 % and 36 %, respectively) than those reported as average or large at birth (25 %).A higher proportion of babies who are reported as very small at birth (14 %) are acutely malnourished than babies reported as average or larger in size (8 %) and the likelihood that a child will be chronically malnourished. Stunting is more common among children who were reported to have been very small at birth (52 %) than among children who were small or average or larger in size at birth (3).

Birth interval

Closely spaced pregnancies are often associated with the mother having little time to regain lost fat and nutrient stores With the exception of first order births, there is an inverse relationship between the length of the preceding birth interval and the proportion of children who are stunted. The longer the interval, the less likely it is that the child will be stunted (3).

Maternal factors

Maternal weight and height

Birth weight, child growth, and adolescent growth determine nutritional status before and during pregnancy (maternal nutrition). Maternal nutrition also influences fetal growth and birth

weight. The presence of an intergenerational link between maternal and child nutrition means a small mother will have small babies who in turn grow to become small mothers. According to EDHS result Wasting is most common in the children of thin mothers (whose BMI is less than 18.5) (15 %) Children born to mothers who are thin (BMI less than 18.5) are more than three times as likely to be underweight (39 %) as children born to mothers who are overweight/obese (12 %) (3).

Maternal education

The mother's level of education generally has an inverse relationship with stunting levels. According to EDHS 2011 children of mothers with more than secondary education are the least likely to be stunted (19 %), while children whose mothers have no education are the most likely to be stunted (47 %)(2). The proportion of underweight children is eight times higher for those born to uneducated mothers than for those whose mothers have more than secondary education (32 percent versus 4 percent)(3).

Child-care practices

A study done in China showed that the introduction of other diet before the age of six months increased the prevalence of pneumonia and diarrheal disease (36). Similarly a study in Kenya showed an increased risk of being underweight when complementary food was started early (39). As a global public health recommendation, infants should be exclusively breastfeed for the first 6 months of life to achieve optimal growth, development and health (38).

The above review of various research studies on child nutritional status has given an important insight into the factors influencing child nutritional status. But none of the studies done earlier has made an attempt to assess the prevalence of malnutrition and household food insecurity in Hossana Town as well as their association among children aged 6-59 months. The present study aims to fulfill the gap that exists in the literature on the prevalence of household food insecurity and malnutrition and the association between these two factors in Hossana Town.
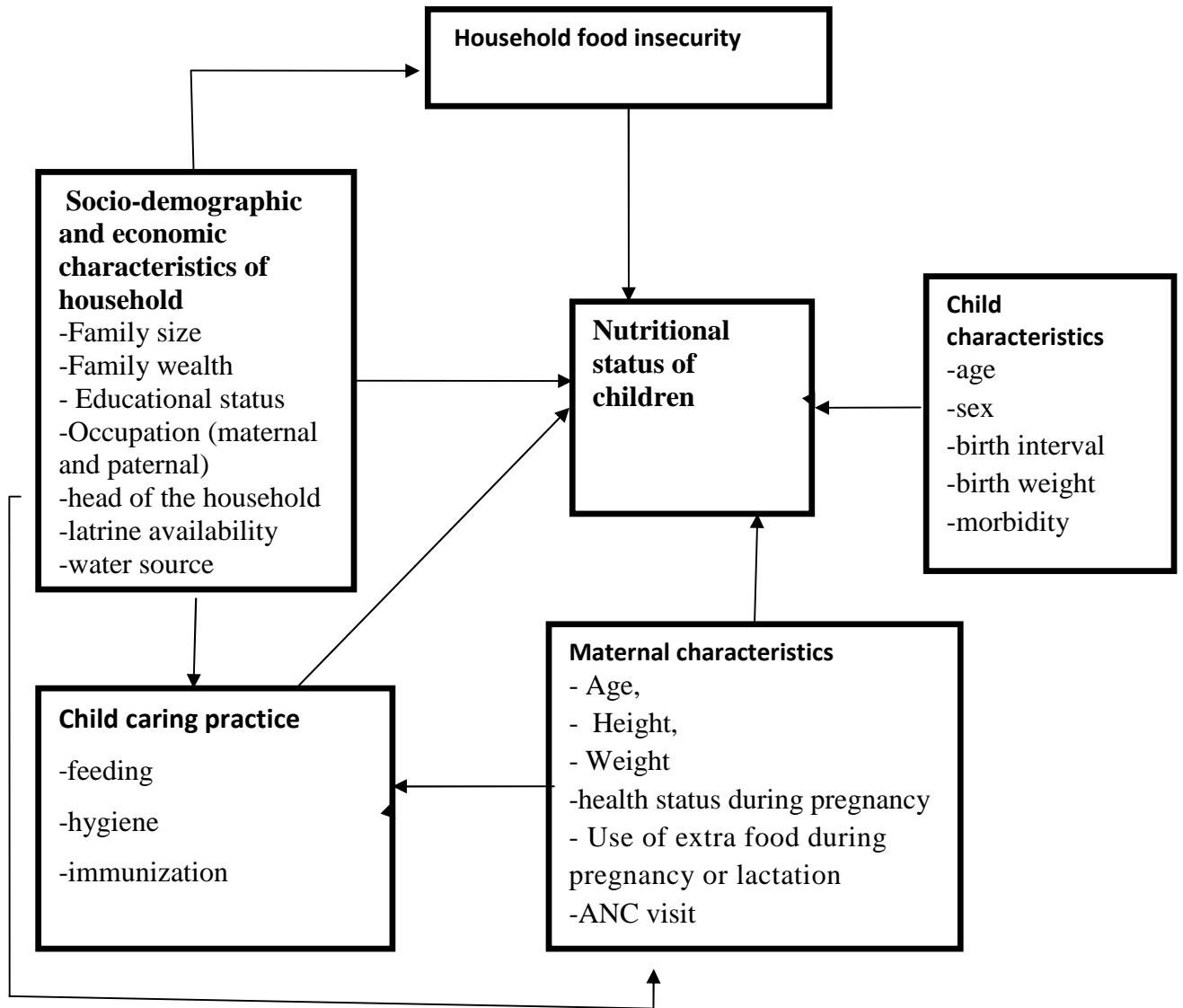
Fig 1.Conceptual framework of the study Adapted from UNICEF conceptual framework (UNICEF 1999).

2.4 SIGNIFICANCE OF THE STUDY

Under nutrition is the most important health and welfare problem among infants and children in Ethiopia. The magnitude and persistence of malnutrition in the country is having frightening implications for children, and the future generation of the country.

Household food insecurity can negatively affect food consumption including reduced dietary variation and nutritional status of household members. The economic status of household is an indicator of food security, so household is one of the most important determinants of child nutritional status. Food insecurity and malnutrition are common among children in southern part of Ethiopia .The prevalence of stunting and underweight in SNNPR 44.1% and 28.3% respectively. There are studies showing the level of household food insecurity and the prevalence of malnutrition in different areas but not in similar setting with Hossana Town. There was no study showing the association between household food insecurity and nutritional status of children.

The aim of this study was to assess the prevalence of household food insecurity and its association with nutritional status of children below the age of five (6-59 months) in Hossana Town. The results of this study will help health authorities and other concerned bodies to design relevant child malnutrition prevention and control measures to ensure healthy growth and good nutrition of the study area.

CHAPTER THREE

3. OBJECTIVES

General objective

➢ To assess the prevalence of household food insecurity and its association with nutritional status of children aged 6-59 months in Hadiya Zone, Hosanna Town.

Specific objectives

   ➢ To determine nutritional status of children aged 6-59 months in Hossana Town during the study period
   ➢ To measure food insecurity among households in Hosanna Town during the study period
   ➢ To examine the association between household food insecurity and nutritional status of children aged 6-59 months by controlling other confounders.

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CHAPTER FOUR

4. METHOD AND MATERIALS

4.1 STUDY AREA AND PERIOD

The study was conducted from February to march 2013 in Hossana Town, which is located in Hadiya Zone of SNNPR at 230 km far from Addis Ababa in south west direction and 168 km far from the regional city Hawassa in North West. The area of the town is 693.64 Hectare or 3978.14 Karemeter and 2350 feet above sea level. According to 2007 census report and as projected in 2011 total population in the town is 92,733 with total number of males 45,875 and females 46,858 and total number of under five children is 14,466. Total number of households is 18,925 according to HEWs numbering report. It has weinadega climatic condition and the average temperature of the town is 17.05^{o}c .It has annual rainfall of 1172.75mm. It has three sub cities namely Gofer Meda, Sechduna and Addis Kifleketema with 8 kebeles and has 3 health centers, one zonal Hospital, 16 non-governmental clinics & 22 total non-governmental pharmacies.

4.2 STUDY DESIGN:

Community based cross sectional study was conducted among children aged 6-59 months in households of Hossana Town.

4.3 POPULATION

4.3.1 SOURCE POPULATION

The source population was all children aged 6-59 months and their index mothers in the households of Hosanna town.

4.3.2 STUDY POPULATION

The study population was selected children aged 6-59 months and their index mothers in the households of Hosanna town.

4.4 ELIGIBILITY CRITERIA

4.4.1   INCLUSION CRITERIA

➢ Children were included in the study according to the following criteria.

✓ Children 6 to 59 months of age.

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

4.4.2   EXCLUSION CRITERIA

➢ A parent who was mentally and physically incapable of being interviewed during the study period was excluded from the study.

4.5 SAMPLE SIZE DETERMINATION AND SAMPLING PROCEDURE

4.5.1   SAMPLE SIZE DETERMINATION

The sample size was calculated by using a single population proportion sample size calculation formula

$$n = \frac{\left(Z_{\left(\frac{\alpha}{2}\right)}\right)^2 P\,(1 - P)}{d^2}$$

considering the following assumptions: **P =42.8%** (prevalence of underweight in shone district ,Hadiya zone)(15), marginal error (d) of **5%,** confidence level of **95%** and **Zα/2** is the value of the standard normal distribution corresponding to a significant level of alpha **(α)** of **0.05**, which is 1.96. This yields a sample size of **376**. Adding 10% for non-response rate, the total sample size was **414** children.

4.5.2 SAMPLING PROCEDURE

For the study, from a total of 8 Kebeles found in Hossana Town, proportionate number of sample children was assigned for each Kebele according to their total number of children 6-59 months of age. Before data collection; the sampling frame i.e. list of households with eligible children for each kebele was identified from HEWs data. Then, sample household with eligible children was selected from the sampling frame prepared for each kebele using systematic random sampling method by calculating the sampling interval, K= 4 (total household with eligible children of the kebele divided by 414). The 1st household with eligible child was selected using lottery method from the four houses in the kebele. Then, every fourth household with eligible children were included in the sample till the allocated sample size of children for each kebele is reached. In households with more than one children of age between 6-59 months, only one child was selected randomly.
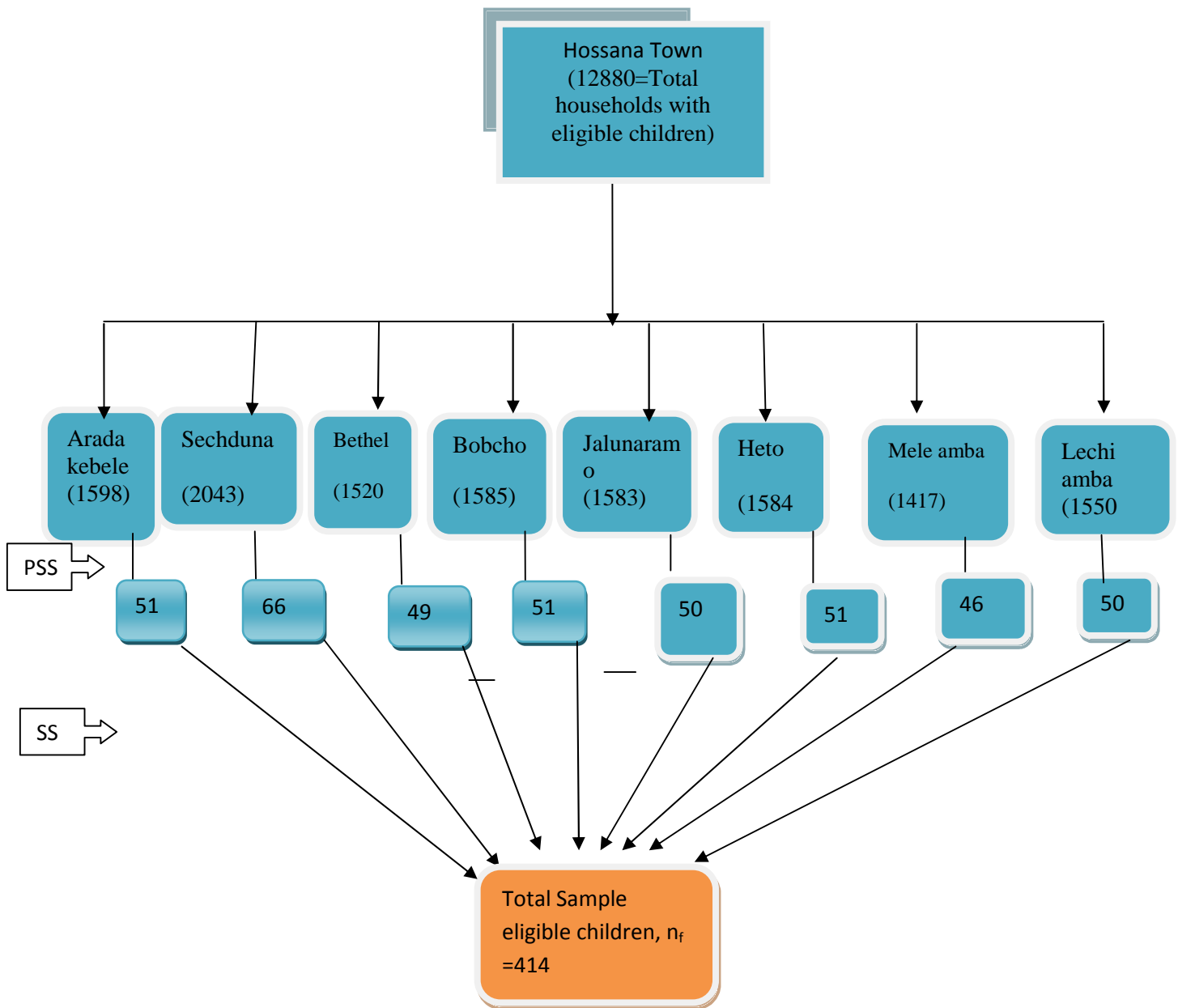
Figure 2: Schematic presentation of the sampling procedure

4.6 DATA COLLECTION INSTRUMENT AND PROCEDURES

4.6.1 DATA COLLECTION INSTRUMENT

Data were collected using pre-tested structured questionnaire and anthropometric measurements. Questionnaires were adapted from different literatures based on HFIAS (7) & UNICEF conceptual framework in English and then, the English version was translated in to Amharic and back translated to English by different individuals who know original version of the questionnaires in order to keep consistency with the original meaning of the questionnaire.

The instrument comprises six parts, part I: socio-demographics and economic characteristics such as head of household, family size, maternal education status, father educational status, occupational status, household wealth, latrine availability and source of drinking water consisting 18 items. Part II: child characteristics such as child age, sex, birth weight, birth interval, morbidity status of child and vaccination status of the child which consists of 18 items. Part III: child caring practices consisting 9 items which are related to early initiation of breast feeding, exclusive breast feeding and complementary feeding practices. Part IV on maternal characteristics like maternal age, number of children ever born and ANC visits which consists 9 items. Part V: Household Food Insecurity Access Scale (HFIAS) Measurement Tool which consist 9 items. The HFIAS occurrence questions relate to three different domains of food insecurity. i. Anxiety and uncertainty about the household food supply ii. Insufficient quality (includes variety and preferences of the type of food) iii. Insufficient food intake and its physical consequences. Each of the questions is asked with a recall period of four weeks (30 days). The respondent is first asked an occurrence question that is, whether the condition in the question happened at all in the past four weeks (yes or no). If the respondent answers "yes" to an occurrence question, a frequency-of-occurrence question will be asked to determine whether the condition happened rarely (once or twice), sometimes (three to ten times) or often (more than ten times) in the past four weeks (7). Part VI anthropometric measurements consist of 5 items such as child and maternal height and weight. .

4.6.2 DATA COLLECTION METHOD

Data were collected from mother of the children in the selected household to fill all part of the questionnaire. Anthropometric measurements are taken from the children and mothers .Weight of the children was measured with minimum clothing and no shoes using a Salter spring scale and UNICEF seca electronic scale in kilogram to the nearest of 0.1 kg.

Measurement of height (length) was done in a lying position with wooden sliding board for children of age under two years (below 85 cm) and for children above two years stature was measured in a standing position in centimeters to the nearest of 1cm. Weight of the mother was measured with seca electronic scale to the nearest 0.1 kg. And height was measured in a standing position in centimeter to the nearest 1 cm.

Vaccination status of children was checked by observing immunization card and if not available mothers were asked to recall it. BCG vaccination was checked by observing scar on right (also left) arm.

4.6.3 DATA COLLECTORS

Eight data collectors' three supervisors and the principal investigator were involved in the data collection. The data collectors were Diploma holder nurses and supervisors were B.sc Nurses. Both the interviewers and supervisors were trained by principal investigator for two days from February 21 to 22/2013 on objective of the research, how to collect the data using the questionnaire and interviewing approach, how to observe the environment to collect information about the environmental condition ,anthropometric measurement and data recording. During the training the trainer was demonstrated how to take anthropometric measurements and the trainee were re demonstrated it in front of the trainer using small sample of children.

4.7 STUDY VARIABLES

4.7.1   Dependent variables

- ✓ Child nutritional status

4.7.2   Independent variables

- ✓ Household food insecurity

4.7.3   Other factors

➢ Socio-economic and demographic characteristics of house hold
- family size,
- family wealth,
- maternal/paternal education
- maternal/paternal occupation
- Water supply and
- sanitation

➢ Child characteristics;
- Age,
- Sex,
- birth interval
- Morbidity status.

➢ Child caring practices;
- feeding,
- hygiene,
- immunization

➢ Maternal characteristics:
- Age,
- weight
- Height,
- number of children ever born
- ANC visits, health status during pregnancy
- Use of extra food during pregnancy.

4.8 OPERATIONAL AND TERM DEFINITIONS

➢ **Stunting**: Children whose height-for-age Z-score is below minus two standard deviations (-2 SD) from the median of the WHO reference population are considered short for their age (stunted), or chronically malnourished (33).

➢ **Severely stunted**: Children who are below minus three standard deviations (-3 SD) from the median of the WHO reference population are considered severely stunted (33).

➢ **Wasting**: Children with Z-scores below minus two standard deviations (-2 SD) from the median of the WHO reference population are considered thin (wasted) or acutely malnourished (33).

➢ **Severely wasted**: Children with a weight-for-height index below minus three standard deviations (-3 SD) from the median of the WHO reference population are considered severely wasted (33).

➢ **Underweight:** Children with weight-for-age below minus two standard deviations (-2 SD) from the median of the WHO reference population are classified as underweight. (33)

➢ **Severely Underweight**: Children with weight-for-age below minus three standard deviations (-3 SD) from the median of the WHO reference population are considered severely underweight. (33).

➢ **Household food insecurity**: if the family experiences any of the conditions (uncertainty, insufficient quality and quantity of food) within the recall period. (if the answer to any of the questions is "rarely," "sometimes," or "often". 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") (7).

➢ **Food secure household:** experiences none of the food insecurity (access) conditions, or just experiences worry, but rarely (7).

➢ **A mildly food insecure household:** worries about not having enough food sometimes or often, and/or is unable to eat preferred foods, and/or eats a more monotonous diet than desired and/or some foods considered undesirable, but only rarely. But it does not cut back on quantity nor experience any of three most severe conditions (running out of food, going to bed hungry, or going a whole day and night without eating) (7).

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➤ **A moderately food insecure household:** sacrifices quality more frequently, by eating a monotonous diet or undesirable foods sometimes or often, and/or has started to cut back on quantity by reducing the size of meals or number of meals, rarely or sometimes. But it does not experience any of the three most severe conditions (7).

➤ **A severely food insecure household** : has graduated to cutting back on meal size or number of meals often, and/or experiences any of the three most severe conditions (running out of food, going to bed hungry, or going a whole day and night without eating), even as infrequently as rarely. In other words, any household that experiences one of these three conditions even once in the last four weeks (30 days) (7).

➤ **Acute Respiratory Illness;** a cough accompanied by short, rapid breathing in the two weeks preceding the survey (3).

➤ **Complementary foods;** are solid and semi solid foods which are required by the child, after six months of age, in addition to sustained breastfeeding (3).

➤ **Diarrhea**: A child with loose stools for three or more times per day in two weeks preceding the survey (3).

➤ **Family size**; refers total number of people living in a house during the study period.

➤ **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 and radio, types of water access and sanitation facilities. 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 of zero and a standard deviation of one. These standardized scores are then used to create the break points that define wealth index as poor, middle and rich.

4.9 DATA PROCESSING AND ANALYSIS

First the data were checked for completeness and consistency. Then it was coded and entered in the computer using SPSS version 16. Anthropometric data were entered in WHO anthro software version 3.2.2 that was used to convert nutritional data into Z-scores of the indices; Height for age, Weight for height and Weight for age then, the data were exported to windows SPSS version 16 programs for analysis. Different frequency tables and descriptive measures were used to describe the study variables.

Bivariate and multivariable logistic regression analysis was used to select variables for multivariable model and see significance of association between dependent and independent variables respectively. All independent variable with p value less than 0.25 in bivariate analysis was entered in to multivariable logistic regression model using ENTER method. P-value < 0.05 was considered as statistically significant in this study and is reported using odds ratio with 95% Confidence interval.

Wealth index analysis: initially, reliability test was performed using the socioeconomic variables involved in measuring the wealth of the households and Chronbach's alpha was calculated to be 0.748. The variables which were employed to compute the alpha value were entered in to the principal component analysis. These variables include the presence of cow, oxen, goat, sheep, chicken, radio or tape, TV, mobile and fixed phone, refrigerator, table, sofa, chair, stove, bed. At the end of the principal component analysis, the wealth index was obtained as a continuous scale of relative wealth. Finally, tercile of the wealth index were created to see the association with nutritional status of children.

Household food insecurity: In this analysis, household food insecurity was assessed using a short version of the Household Food Insecurity Access Scale (HFIAS) developed by the Food and Nutrition Technical Assistance (FANTA) project (7).
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.

The data analyzed for this study were based on the answers to nine questions. Each question had four response options—never, rarely, sometimes, or often—which were coded in order increasing frequency from 0 to 3. 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 was rarely," "sometimes," or "often"). All households that did not meet this condition were classified as food secure. The only exception was among households which the respondent's answer to question 1 was "rarely" but the response to all the other questions was "never." Such households were also considered food secure. A severely food insecure household has graduated to cutting back on meal size or number of meals often, and/or experiences any of the three most severe conditions (running out of food, going to bed hungry, or going a whole day and night without eating), even as infrequently as rarely. In other words, any household that experiences one of these three conditions even once in the last four weeks (30 days) is considered severely food insecure (7).

4.10 DATA QUALITY CONTROL

The questionnaire was initially prepared in English, and then it was translated to Amharic for field work purpose. Then the Amharic version translated back to English to check for any inconsistencies or distortion in the meaning of words or concepts. Eight data collectors' three supervisors and the principal investigator were involved in the data collection process. Before data collection, training and guideline was provided for data collectors and supervisors on how to interview and how to take anthropometric measurements.

Data was collected by trained data collectors and pretesting of the instrument was made before one week of the actual data collection. For this: investigator, supervisors and data collectors were take a part in a pre-test of the survey questionnaire and measuring instruments among 5% of the sample similar to the study population, Consequently, based on the feedback obtained from the pre-test the questionnaire was reviewed and supervisors and data collectors were oriented based on the changes that was made.

The scales of indicators were checked against zero reading before and after weighing every child.

Each data collector team was assigned in specific Kebeles, and adjacent Kebeles' households were surveyed on the same day, so that double counting was avoided. Each supervisor supervised designated data collectors within a given Kebeles. The supervisors were supervised the data collectors on daily basis for completeness and consistence of the filled questionnaires and errors were returned to the interviewers for revisiting.

In addition, the data was thoroughly cleaned and carefully entered in to computer using SPSS version 16.0 for beginning of analysis.

4.11   ETHICAL CONSIDERATION

Prior to data collection, ethical clearance was obtained from the ethical clearance committee of Jimma University. A formal letter, from the college of Public Health and medical sciences of Jimma University, was submitted to Hadiya zone health office, Hossana Town administration, kebele, to all relevant offices and concerned bodies to obtain their co-operation. All participants' right to self-determination and autonomy were respected. All study participants were informed about the purpose of the study and any additional information was given verbally.

Participation was voluntary and participants can withdraw from the study at any stage/time without explanation and penalty or loss of benefit. Maximum effort was made to maintain confidentiality during data collection and analysis that their name was not registered and used during data collection and analysis. The purpose of the study was communicated to respondents to provide accurate & honest response.

4.12   PLAN OF DISSEMINATION OF RESEARCH FINDING

After the final thesis work is approved it was presented to Jimma University. Results will be communicated to, Hadiya zone health bureau & Hossana Town administration health office. Also, all effort will be made to publish the thesis in scientific journal.

CHAPTER FIVE

5. RESULT

5.1 Socio-demographic characteristics of respondents

From the selected 414 houses, 411 gave complete response to the interview making a response rate of 99%. The rest 3(1%) were excluded because 3 gave incomplete information.

A total of 411 households, having at least one child aged 6-59 months, were included in the analysis from Hossana Town, Hadiya zone, South Ethiopia. Three hundred fifty seven households (86.9%) were headed by males. Among the respondents, 394(95.9%) were married. The mean household size was 5.18 (SD: 1.746, Range: 2 to 10), meanwhile, the mean of children born to a mother was 2.84 (SD: 1.721, Range: 1 to 10) and this figure for under five years age group was 1.39 (SD: 0.566, Range: 1 to 3) (Table1).

Regarding educational status the majority, 209(50.9%) mothers were completed grade 1-8, and most of husbands completed grade 9-12, 175 (42.6%). Majority of the mothers 314(76.4%) were housewives and 168(40.9%) fathers were daily workers. Among respondents 307(74.7%) were from ethnic group Hadiya and 253(61.6%) were followers of protestant religion. Regarding household wealth about 33.3% households were poor (Table 1).

Table 1 Socio demographic characteristics of households Hossana town, Hadiya zone, south Ethiopia, March 2013

Characteristics		Number	Percent
Head of household	Female	54	13.1
	male	357	86.9
Marital status of mothers	Single	2	0.5
	Married	394	95.9
	Divorced	14	3.4
	widowed	1	0.2
Total family size	2-5	230	56
	>5	181	44
Number of under five children	1	269	65.5
	2	125	30.4
	3	17	4.1
Educational level of mother	illiterate	56	13.6
	Grade 1-8	209	50.9
	grade 9-12	110	26.8
	Collage and above	36	8.7
Educational level of father	illiterate	39	9.5
	Grade 1-8	129	31.4
	grade 9-12	175	42.6
	Collage and above	68	16.5
Occupation of mother	House wife	314	76.4
	Farmer	5	1.2
	Merchant	31	7.5
	Working in NGO	15	3.7
	Government employee	46	11.2
.Occupation of father	Farmer	20	4.9
	Government employee	88	21.4
	Merchant/Trade	76	18.5
	Private Org	59	14.4
	daily laborer	168	40.9
Ethnicity of mother	Hadiya	307	74.7
	Kembata	30	7.3
	Gurage	22	5.4
	Amhara	17	4.1
	Others [*]	35	8.5
Religion of mother	Protestant	253	61.6
	Orthodox	128	31.1
	Muslim	17	4.2
	Catholic	10	2.4
	Jehovah witness	3	.7
Wealth index	Poor	137	33.3
	Middle	138	33.6
	Rich	136	33.1

* Silte (10), Oromo(11), Tigre(5) and wolayta (9)

Almost all 395(96%) of respondents were using pipe water (public and private tap) and had latrine. The majority 203(49.4%) were using private slab latrine and 244 (59.4%) of respondents dispose solid wastes (domestic waste) in a pit. 339(82.5%) practiced hand washing before handling food using water and soup (Table 2).

Table 2: Water and sanitation indicators in Hossana town Hadiya zone, south Ethiopia, March 2013

factor	category	number(n)	percent
	Private tap	218	53.0
Source of	Private well	6	1.5
drinking water	Public tap	177	43.1
	Other*	10	2.4
Type of latrine	Private slab / cement	203	49.4
	Private pit / wooden slab	179	43.6
	Shared latrine/ Shared	29	7
Garbage disposal	Open field	65	15.8
	In a pit	244	59.4
	Burning	99	24.1
	Municipality	3	.7
separate room for	Yes	97	55.4
livestock's	no	78	44.6
(n= 175)**			

*spring and river

**for those households having livestock only

5.2 Child characteristics

From the total children, 56.7% were males. The interval between births was two for 40.3% of children and three for 25.3% of children. Place of delivery was at home for 26.8% of the children. Birth weight was small for 7.4% of the children and was larger than the average for 11.3%. Ninety (21.9%), seventy six (18.5%) and 115(28%) of children had diarrhea, ARI and fever in the past two weeks preceding the study (Table 3).

Table 3: Child characteristics, Hossana town, Hadiya Zone, southern Ethiopia, March 2013

characteristics	category	number	percent
Child sex	male	233	56.7
	female	178	43.3
Child age	6-11	41	10
	12-23	132	32.1
	24-35	124	30.2
	36-47	71	17.2
	48-59	43	10.5
Birth interval** (n=273)	One year	40	14.7
	Two years	110	40.3
	Three	69	25.3
	More than four	54	19.7
Place of delivery	Health facility	301	73.2
	home	110	26.8
Gestational age at birth	9 month	388	94.4
	>9 month	19	4.6
	< 9 month	4	1.0
Child weighed at birth	Yes	205	49.5
	no	206	50.5
How much was the weight(n=204)*	<2.5kg	15	7.4
	2.5-3.5kg	166	81.4
	>3.5	23	11.2
How big was the child	Very large	12	2.9
	Larger than average	122	29.7
	Average	238	57.9
	small	39	9.5
Type of birth	Multiple/twin	38	9.2
	single	373	90.8
Diarrhea in the last two weeks	Yes	90	21.9
	no	321	78.1
Presence of respiratory disease in the last 2 weeks	Yes	76	18.5
	no	335	81.5
fever	Yes	115	28
	no	296	72
measles	Yes	5	1.2
	no	406	98.8

* Weight of children as reported by mothers
**birth interval for those children who are not first order births

5.3 Child caring practice

Majority of mothers 242(58.9%) initiated breast feeding within one hour after delivery. only 26 (6.3%) discontinue breast feeding before 12 months.

Majority 373(90.8%) of mothers exclusively breast fed their children 4-6 months. Twenty eight (6.8%) of mothers started complementary food for their children before 6 month. About 152(37%) of mothers breast fed their children one to two years and 42.3% of children are still breast feeding.

Regarding immunization status of children, majority 409(99.5%) of children were vaccinated. and 392(95.8%) were finished measles vaccination. Majority of children 381 (92.7%) got vitamin A supplementation in the last six months preceding the survey (Table 4).

Table 4: child care practice in Hossana town, Hadiya zone, southern Ethiopia, March 2013

characteristics	category	number	percent
Ever breast fed the child	Yes	411	100
	No	0	0
How long after birth the child breast fed	Immediately	242	58.9
	After an hour	166	40.4
	After one day	3	0.7
At what age did you start additional food	1-5 month	28	6.8
	6-12 month	383	93.2
What do you use to feed the child	Bottle	126	30.7
	Cup	157	38.2
	Spoon	102	24.8
	dish	26	6.3
Duration of breast feeding	<6 month	2	0.5
	6-12 months	24	5.8
	13-24 months	152	37
	>2 years	59	14.4
	Still feeding	174	42.3
How many Months Exclusively breast fed	<=3 month	7	1.7
	4-6 month	373	90.8
	>6 month	31	7.5
child immunization	Yes	409	99.5
	No	2	0.5
BCG(n=409)	Yes	407	99.5
	No	2	0.5
Penta (n=409)	Yes	407	99.5
	no	2	0.5
Polio 3(n=409)	Yes	403	98.5
	No	6	1.5
measles'(n=409)	Yes	392	95.8
	No	17	4.2
Vitamin A supplementation in 6 months	Yes	381	92.7
	No	30	7.3
Bath taking of the child	Daily	389	94.6
	Weekly	16	3.9
	other	6	1.5
Who is taking care of baby feeding	Mother	335	81.5
	Grand mother	24	5.8
	Sister	27	6.6
	House maid	25	6.1

5.4 Maternal characteristics

Majority of mothers 237(57.7%) were in the age group 25-34 years. The mean age of mothers was 26.89(SD: 4.6, Range 18 to 38). Average total children born to a mother was 2.84 (SD: 1.7, range 1 to 10). Regarding ANC majority 383(93.3%) of mothers attend health facility for ANC. No extra food was taken from the usual time during pregnancy and lactation for 32.2% of mothers. Underweight was prevalent in 7.9% of mothers, 14.5% were overweight and1.7% were obese (Table 5).

Table 5 Maternal characteristic in Hossana Town, Hadiya Zone, South Ethiopia, March 2013

characteristics	category	Number	percent
Mothers age	15-24	128	31.1
	25-34	237	57.7
	35-45	46	11.2
total number of children ever born	<=4	335	81.5
	>4	76	18.5
Extra food consumption during pregnancy and lactation	Yes	278	67.6
	no	133	32.4
ANC visits	Yes	383	93.2
	No	28	6.8
Usually washing hand before handling food	Yes	339	82.5
	No	72	17.5
How do you wash your hands (n=339)	Using water	15	4.4
	Soap and water	323	95.4
	ash	1	0.2
For how long do you think the child should be breast fed	1-12 month	27	6.6
	13-24 month	242	58.9
	>24 month	142	34.5
Mothers BMI	<18.5	32	7.9
	Normal	312	75.9
	Overweight	60	14.5
	Obese	7	1.7

5.5 Prevalence of household food insecurity

The nine food insecurity questions in the HFIAS were used to examine the distribution of the households in different categories of food access (uncertainty, quality and quantity).

As can be seen in Table 6, the questions follow a progression that begins with anxiety about the food supply, followed by a decrease in the quality of food, a decrease in the quantity of food, and finally going to sleep hungry and going all day and night without eating any food (during the 4 weeks preceding the survey). A very high proportion of the households gave affirmative responses to worrying about food inaccessibility (64.8 %), inability to eat preferred food (71%) and availability of a limited variety of food (68.4 %) (Table6).

The proportion of affirmative responses given for the last three items was smaller compared with the first six items, during the reference period, 0.7 % reported going for a whole day and night without food; 3 % reported going to sleep without any food; and 23.1 % of the respondents gave affirmative responses to 'ever no food to eat'. The nine items can further be summarized into three major domains: (i) feelings of uncertainty or anxiety about the household food supplies (represented by item 1); (ii) Perceptions that household food is of insufficient quality and food type preference (represented by items 2–4); and (iii) insufficient food intake and its physical consequences (Items 5–9). On the basis of these categories, the computed average for the second domain (food quality) was 68.03 % and for the third domain (food quantity) was 27.14 % (Table 6).

Taking over all pictures of HFIAS, the prevalence of household food insecurity was 79.1%. Two hundred twenty six households (55%) moderately food insecure, 48(11.7%) households were severely food insecure (Table 6).

Table 6 prevalence of household food insecurity in Hossana Town, Hadiya Zone, Southern Ethiopia, March 2013

characteristics	Option	n	percent
Worry about food insecurity in the last month	Never	145	35.2
	Rarely	32	7.8
	Sometimes	191	46.5
	Often	43	10.5
Inability to eat preferred food in the last 4 weeks	Never	119	29
	Rarely	58	14.1
	Sometimes	201	48.9
	often	33	8
Availability of limited variety of food in the last 4 weeks	Never	130	31.6
	Rarely	41	10
	Sometimes	208	50.6
	often	32	7.8
Eat some foods that you really did not want to eat because of a lack of resources to obtain other types of food?	Never	145	35.3
	Rarely	60	14.6
	Sometimes	177	43
	often	29	7.1
Availability of smaller amount of food in the last 4 weeks	Never	173	42.1
	Rarely	67	16.3
	Sometimes	152	37
	Often	19	4.6
Reduced number of meals per day	Never	200	48.7
	Rarely	71	17.3
	Sometimes	132	32.1
	often	8	1.9
Ever no food to eat I the last 4 weeks	Never	316	76.9
	Rarely	40	9.7
	Sometimes	53	12.9
	often	2	0.5
Sleeping without eating any food in the last 4 weeks	Never	399	97
	Rarely	6	1.5
	Sometimes	6	1.5
	often	0	0
Spending the day and the night without eating any food	Never	408	99.3
	Rarely	3	0.7
	Sometimes	0	0
	often	0	0
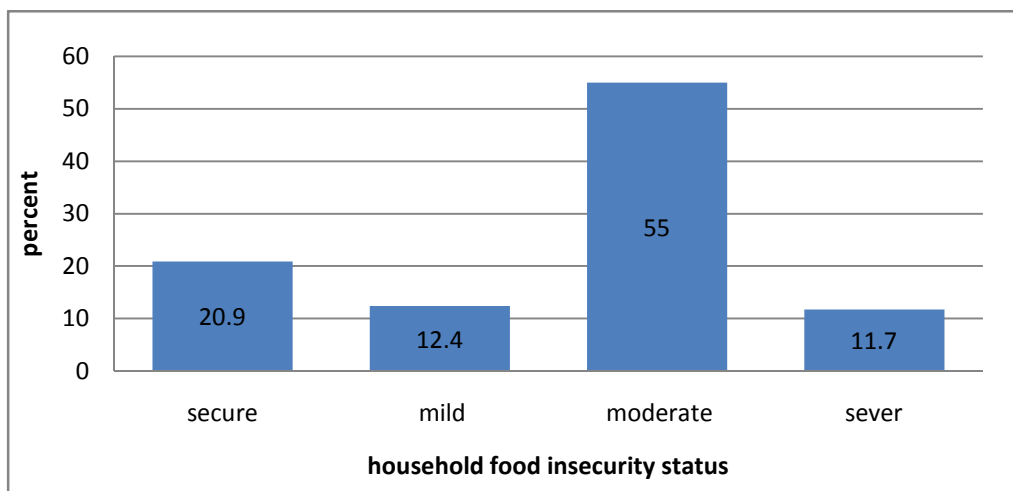
Fig.3 Over all prevalence of household food insecurity, Hossana Town, southern Ethiopia, March 2013

5.6 Anthropometric measurements

Among 411 children, 233 (56.7%) were males. The mean age, HAZ, WHZ and WAZ were 27.61 months (SD: 12.94, Range: 6-59), -1.4569 (SD: 1.4, Range: -4.85 to 2.67), 0.076 (SD: 1.4, Range: -3.97 to 3.07), and 0.71 (SD: 1.1, Range: -3.45 to 1.76), respectively.

Thirty three (8%), 59(14.4%) and 178 (43.3%) children were wasted, underweight and stunted, respectively (Table 7).

Table 7 Nutritional status of children Hossana town, Hadiya zone, south Ethiopia, March 2013

Measure	category	number	percent
HAZ	Severely stunted	41	10
	Moderately stunted	137	33.3
	normal	233	56.7
WHZ	Severely wasted	3	0.7
	Moderately wasted	30	7.3
	normal	378	92
WAZ	Severely underweight	8	2
	Moderately underweight	51	12.4
	normal	352	85.6

5.7 Household food insecurity and nutritional status of children

In bivariate Analysis household food insecurity was associated with underweight but not with stunting and wasting. In multivariable logistic regression household food insecurity was associated with underweight while controlling other variables (Table 8). Other factors were also associated with being stunted, wasted and underweight.

During bivariate analysis six factors had p<0.25 with underweight, four factors had p<0.25 with wasting and six factors had p<0.25 with stunting. Out of six factors, multivariable logistic regression analysis confirmed only household food insecurity and large family size as potential predictor for underweight (Table 8).

Table8 Multivariable logistic regression models predicting being underweight among 6-59 months of children in Hossana Town, Hadiya Zone, South Ethiopia, March 2013

Factors	categories	Status				Crude OR (95%CI)	AOR(95% CI)
		Underweight		normal			
		N	%	N	%		
Household food insecurity	Secure	4	6.8	82	23.3	1	1
	insecure	55	93.2	270	76.7	4.2(1.469,11.87)*	4.0(1.33,11.39)*
Total family size	2-5	16	26.1	214	60.8	1	1
	>5	43	72.9	138	39.2	4.2(2.259,7.69)*	3.9(2.097,7.355)*
Child sex	Male	40	67.8	193	54.8	1.734(0.966,3.113)	1.54(0.829,2.855)
	Female	19	26.2	159	45.2		1
Diarrhea	Yes	21	17	69	24.1	0.641(0.311,1.320)	1.53(0.78,3.014)
	No	12	83	309	75.9	1	1
Fever	Yes	12	20.3	103	29.3	0.617(0.315,1.211)	0.65(0.317,1.318)
	No	47	79.7	249	70.7	1	1
Exclusive breast feeding	<=3	2	3.4	5	1.4	5.8 (0.657,51.819)	11.43(.806,117.42)
	4-6	55	93.2	318	90.3	2.508(0.582,10.812)	3.5(.799,15.65)
	>6	2	3.4	9	9.3	1	1

*p value <0.05

Those households which were food insecure have 4 times as likely to have underweight children than food secure households (OR= 4.0, 95% CI: 1.33- 11.39). Households having large family size have 3.9 times higher risk of having underweight children than households with small family sizes. (OR=3.9, 95% CI: 2.097- 7.355) (Table8).

Out of six factors which were included in multivariable logistic regression model only two variables, child sex and child age showed significant association with stunting. As compared to child's age grouped 48-59 months, there was lesser risk of becoming stunted for the age group 6-11 month (OR=0.056, 95% CI: 0.011- 0.288). Male children were 2.1 times more likely to be stunted than female children (OR=2.05, 95% CI : 1.186-3.556) (Table 9).

Table9 Multivariable logistic regression models predicting being stunted among 6-59 months of children in Hossana Town, Hadiya Zone, South Ethiopia, March 2013

Factors	categories	Status				Crude OR (95%CI)	Adjusted OR (95% CI)
		stunted		normal			
		N	%	N	%		
Educational level of mother	Illiterate	21	11.8	35	15	0.339(0.142,0.809)*	0.739(0.223,2.448)
	Grade 1-8	86	48.3	123	52.8	0.395(0.190,0.823)*	0.614(0.214,1.759)
	Grade 9-12	48	27	62	26.6	0.438(0.201,0.952)*	0.476(0.151,1.501)
	Collage& above	23	12.9	13	5.6	1	1
Child sex	Male	112	62.9	121	51.9	1.571(1.055,2.339)*	2.05 (1.186,3.556)*
	female	66	37.1	112	48.1	1	1
Child age	6-11	12	6.7	26	12.4	0.395(0.161,0.972)*	0.06(0.011,0.288)*
	12-23	74	41.6	58	24.9	1.218(0.611,2.247)	0.68(0.249,1.838)
	24-35	45	25.3	79	33.9	0.544(0.270,1.096)	0.48(0.183,1.260)
	36-47	25	14	46	19.7	0.519(0.240,1.122)	0.41(0.146,1.171)
	48-59	22	12.4	21	9	1	1
Birth interval	One year	14	5.6	26	6.9	0.992(0.421,2.336)	0.88(0.342,2.246)
	Two years	50	33.7	60	39.5	1.531(0.783,3.009)	1.39(0.664,2.908)
	Three	37	10.1	32	17.6	2.130(1.024,4.429)*	1.54(0.690,3.428)
	More than four	19	50.6	35	36.1	1	1
Mothers age in year	15-24	63	35.4	65	27.9	2.746(1.305,5.777)*	2.62(0.978,7.017)
	25-34	103	57.9	134	57.5	2.178(1.075,4.414)*	2.1(0.914,4.839)
	35-44	12	6.7	34	14.6	1	
Health status during pregnancy	Sick	145	81.5	200	85.8	1.379(0.814,2.338)	0.74(0.367,1.516)
	good	33	18.5	33	14.2	1	1

*p value < 0.05

Out of four factors entered in multivariable logistic regression analysis, only diarrhea in the past two weeks was significantly associated with wasting. Those children who had diarrhea in the past two weeks were eight times as likely to be wasted than those children who had no diarrhea(OR= 8.1 ,95% CI: 3.678-17.86) (Table 10).

Table10 Multivariable logistic regression models predicting being wasted among 6-59 months of children in Hossana Town, Hadiya Zone, South Ethiopia, March 2013

Factors	categories	wasted		Normal		Crude OR(95%CI)	Adjusted OR(95% CI)
		N	%	N	%		
Food insecurity	Yes	3	9.1	83	22	2.814(0.838,9.45)	2.59(.707,9.483)
	No	30	90.9	295	78	1	1
Diarrhea in the last 2 weeks	Yes	21	63.6	69	18.3	7.84(3.681,16.686)*	8.1(3.678,17.86)*
	No	12	36.4	309	81.7	1	1
Child age	6-11	3	9.1	38	10.1	1.618(0.256,10.219)	1.214(0.169,8.735)
	12-23	5	15.2	127	33.6	.807(0.151,4.318)	0.796(.135,4.686)
	24-35	15	45.5	109	28.8	2.821(0.618,12.879)	3.489(0.699,17.426)
	36-48	8	24.2	63	6.7	2.603(0.526,12.876)	2.320(0.441,12.598)
	49-59	2	6.1	41	10.8	1	1
Mothers occupation	Housewife	25	75.8	289	76.5	1.24(0.359,4.283)	0.912(0.238,3.493)
	Farmer	2	6.1	3	0.8	9.556(1.127,81.05)*	6.033(0.585,62.186)
	Merchant	2	6.1	29	7.7	0.989(0.155,6.288)	0.532(0.72,3.957)
	Working in NGO	1	3	14	3.7	1.024(0.098,10.651) 1	0.632(0.51,7.848) 1
	Gov't employee	3	9.1	43	11.4		

*P value < 0.05

CHAPTER SIX

6. DISCUSSION

Nutritional status of children

According to WHO, underlying malnutrition is responsible for half of the deaths occurring among children under five years of age. Studying causes of malnutrition and acting upon, therefore, would help in magnificent reduction in mortality in this age group. This study showed the area was affected by malnutrition and food insecurity and also tried to see the association between these two factors.

The levels of underweight, wasting and stunting were 14.4%, 8% and 43.3%, respectively. These prevalence rates of malnutrition indicated that the under five children (6-59 months) of this study area were in better condition as compared to malnutrition reported by other study done in North showa Zone (22). This could be due to the study was done in more food insecure households which are more vulnerable to malnutrition. The level of underweight obtained in this study was also less as compared with other studies done in north Showa zone, Gumbrit and Antioquia, Colombia. (22, 23, 31).

Although the prevalence rates of malnutrition computed from the anthropometric measurements of the study children are not very severe as compared to the national figure, there is still a high level of malnutrition, which needs the attention of the responsible bodies. The Ethiopia Demographic and Health survey indicates that the prevalence of underweight, wasting and stunting are 29%, 10.9% and 44%, respectively (3).

The prevalence of wasting 8% was almost similar with the national figure, which was 10.9%. Severe wasting was lower 0.7% as compared to 2.2% of the national figure. Also, the proportions of children underweight (14.4%) and severely underweight (1.9%) were smaller 29% and 9% (national), and 28.3% and 9.6% (regional), respectively. However, the figures of wasting and severe wasting were consistent with SNNP regional figures of wasting (6.6 %) and severe wasting (0.9%). Similarly, the prevalence of stunting (43.3%) was similar with national (44%) and regional (44.1%) figures, whereas the prevalence of sever stunting is lower than regional and national figure (3). The discrepancy may be attributable to the difference in the study area and sample size.

Household food insecurity

This study showed high prevalence of household food insecurity computed from full version of HFIAS tool. Very high proportion of the households gave affirmative responses to worrying about food inaccessibility (64.8 %), inability to eat preferred food (71%) and availability of a limited variety of food (68.4 %). The figures are similar with findings of the study conducted in Sidama zone (66.5 %) worrying about food inaccessibility, inability to eat preferred food (70.9 %) and availability of a limited variety of food (72.9 %). Taking overall pictures of HFIAS the prevalence of household food insecurity was 79.1%. It is also consistent with the prevalence in Sidama zone which was 82.3% (19). Similarly in a study conducted in Tanzania using the HFIAS revealed that 79.3 % were food insecure, more than 50% of the households experienced some degree of food insecurity with 34.5% reporting child hunger. This is suggesting that the overall severity of food insecurity may influence the patterns of response to the anxiety/worry item (29).

 A study on coping strategies conducted in South Africa also showed that 74 % of respondents limited their variety of food, limited portion size (80 %) or skipped meals (68 %) (35). Likewise a study conducted in Bangladesh showed more households affirmed consuming lower-quality food (55.3 %) more often than worrying about their food supply (36.3 %) (34).

Household food insecurity and nutritional status of children

Children are vulnerable to the consequences of food insecurity and malnutrition because of their physiology and high calorie needs for growth and development. Malnutrition is the underlying cause of death of more than 2.6 million children each year, a third of under-five deaths, and a third of total child deaths worldwide (25).

This study showed a high prevalence of household food insecurity and malnutrition among children aged 6-59 months in Hossana Town Hadiya zone south Ethiopia. Household food insecurity was related to underweight but not with stunting and wasting. The finding was consistent with other finding in Antioquia, Colombia showed a statistically significant inverse association with household food security status: the more food insecure the household, the higher the prevalence of underweight or risk of underweight children. Similarly wasting and risk of wasting did not show a significant association with food security status (31).

The significant association between household food insecurity and underweight was expected because of the substantial evidence that a household's access to food is among the key determinants of the nutritional status of children (31). However lack of association with wasting may show that household food insecurity was necessary but not sufficient prerequisite for these outcome variables.

Other factors

The result of the present study indicated that child's age and sex are the factors associated with stunting in the study area **.**Male children are more likely to be stunted than female children (67% and 32%, respectively) .This result is consistent with EDHS 2011 (3).

Most cross-sectional studies in developing countries (43) have shown that female children are at higher risk of stunting than male children. Few studies showed boys are more malnourished than girls (42). Similarly the finding of the study conducted in West Gojam Zone revealed that male children face nutritional disadvantages compared to female children (41).The differences may be attributed to unmeasured factors such as parental care-giving behaviors. In light of the

fact that males are more likely to be stunted than females in Hossana Town, sex-related differences in diet and child care require further exploration.

EDHS 2011 indicated the prevalence of stunting increases as the age of a child increases, similarly the present study showed that there was a higher risk to be stunted to child's age grouped 48-59 months as compared to children 6-11 month. This could be due to the lack of adequate and appropriate feeding when breastfeeding could not suffice the nutritional requirement of the child as the age goes on. Rampant food insecurity in the area could explain these all.

Those households having large family size had four times higher risk of having underweight children than households having small family sizes. The effect of a large family size with overcrowding and inadequate spacing has been implicated as a risk factor for malnutrition in different studies as well (39, 40). This supports the notion that non-nutritional factors should be essential components in the effort to reduce malnutrition in Ethiopia.

Those children who had diarrhea in the past two weeks had eight times as likely to be wasted than those children having no diarrhea. This indicates that childhood illness is the main factor for acute nutritional problem; Illness affects dietary intake and utilization.

This is not surprising since there is a reciprocal relationship with diarrhea leading to malnutrition and malnutrition predisposing to diarrhea. The result of this study may suggest that children suffered from repeated bouts of diarrhea which is detrimental to their nutritional status. It is also documented that malnourished children have more severe diarrheal episodes and a child with diarrhea loses weight and can quickly become malnourished. Prevention is important because once diarrhea occurs; the body is weakened and susceptible to malnutrition and future bouts of diarrhea.

STRENGTH OF THE STUDY

Since it was community based study it has resulted valuable and generalizable finding as per objectives of the study. The topic is direct operational and public health important.

Valid questionnaires used in other studies were adapted for this study.

LIMITATION OF THE STUDY

The study design was cross-sectional which measures the exposure and out come at the same time rather than longitudinal design, so it is difficult to determine causal relationships between the proposed predictors and the outcomes of interest. Respondent may not tell the real information about their food security status due to the need for aid. This may affect the result of the study.

Some measurements may not be accurate due to subjective responses and recall biases from answers based on the past memories of the mothers.

CHAPTER SEVEN

7. CONCLUSION & RECOMMENDATION

7.1 CONCLUSION

Household food insecurity and Malnutrition as measured by underweight, wasting and stunting was high in Hossana Town. Household food insecurity was associated with underweight. However its lack of association with wasting may show that household food insecurity was necessary but not sufficient prerequisite for this outcome variable.

Child sex (male), child age (48-59 months), presence of diarrhea in the last two weeks and large family size were also associated with measures of under nutrition.

7.2 RECOMMENDATION

✎ **Zonal health department and Hossana town administration health office**

ZHD and HTAHO have to give attention on prevention and control of diarrheal disease through improving sanitation and hygiene practices .Has to design strategy on Promotion of better child and maternal caring practices.

✎ **Health service providers**

HEWs and other health care professionals in the area have to take the identified problems in to consideration in order to take appropriate measure for children who are malnourished and should focus on regular follow up of malnutrition in the area. Furthermore HEWs have to share and act on information about diarrhea management with mothers in the study area.

✎ **Other relevant bodies**

Intervention initiatives should focus on improving household food insecurity and nutrition education. Improved multi-sectorial interventions are needed to address multifaceted causes of malnutrition.

Further research is required on the relationship between household food insecurity and nutritional status of children in different areas using different methodological approach.

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ANNEX I QUESTIONAIRE

JIMMA UNIVERSITY

COLLEGE OF PUBLIC HEALTH AND MEDICAL SCIENCES

DEPARTMENT OF EPIDEMOLOGY

Title: prevalence of household food insecurity and its association with nutritional status of children aged 6-59 months in Hossana town, southern Ethiopia

Consent Form

My name is_____   I am working as data collector in a survey conducted by post graduate student of Epidemiology department of Jimma University, so as to assess child nutritional status and household food insecurity. I am going to ask you some questions that are very important for the programmers to plan effective malnutrition prevention program. Your name will not be written on this form and will never be used with any information you may tell me. 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, your honest answer to these questions is very important for the purpose of the study. It will take 30 minutes to complete the questionnaire. If you have any problem or question on the survey you can call to +251-0913-302585or 047-111-2587

We would very much appreciate your participation in this survey by genuinely responding to the interviews. Would you be willing to participate?

Yes_____

If no thank and stop here.

    Questionnaire identification number_____

    Kebele_____

    House number_____

    Interviewe[r]'s name and signature _____

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

Supervisors name and signature_____

GENERAL INSTRUCTIONS (asking questions and recording answers)

All questions in this paper are based on interviewing the mother of the child and anthropometric measurements. It is very important that you ask each question exactly as it is written on the questionnaires. In addition to the questions, some of the questions have pre-coded responses. It is important that you do not read these alternatives/choices aloud to the mother. When you ask a question, you should listen to the mother's response/answer, and then circle the code next to the category that best matches her answer/response. Avoid writing the name.

PART ONE: SOCIO ECONOMIC AND DEMOGRAPHIC CHARACTERSTICS OF HOUSEHOLD

No	Question	option	Skip to/Remark
101	Head of the Household	1. Female 2. Male	
102	Marital status	1. Single 2.Married 3. Divorced 4. Widowed	
103	Total family size (How many person live in the Household?)	In number_____	
104	How many children <5 year live in the household?	In number_____	
105	Educational level of mother	1. illiterate 2. Grade 1-8 3. grade 9-12 4. Collage and above	
106	Educational level of father	1.illitrate 2. Grade 1-8 3. grade 9-12 4. Collage and above	
107	Occupation of mother	1. House wife only 2. Farmer 3. Merchant/Trade 4 Private Organization employee 5. Government employee Daily laborer 96. Other (specify)	

108	Occupation of father	1. Farmer 2. Government employee 3. Merchant/Trade 4. Private Org. employee 5. Daily worker 96. Other (specify)----		
109	Ethnicity	1. Hadiya 2. Kembata 3. Gurage 4. Amhara 96. Others (specify)		
110	What is your religion?	1 Protestant. 2. Orthodox 3.Muslim 4. Catholic 96. Others(specify)		
111	Does this household currently have any of the following animals?(circle the answer)	1. Yes	0. No	How many?
	Oxen?	1	0	
	Cow?	1	0	
	Goat / sheep?	1	0	
	Chicken?	1	0	
112	Does this household currently have any of the following items? (circle the answer)	1.Yes	0. No	
	Functioning radio?	1	0	
	Functioning television?	1	0	
	Functioning tape recorder/CD player?	1	0	

	Kerosene stove?	1	0	
	Telephone?	1	0	
	Electric stove?	1	0	
	Sofa?	1	0	
	Bed?	1	0	
	Bicycle?	1	0	
	Motor cycle?	1	0	
	Spring mattress?	1	0	
	Foam mattress?	1	0	
	Grass mattress?	1	0	
	Chair?	1	0	
	Table?	1	0	
	Refrigerator?	1	0	
113	What is your main source of drinking water?	1.Private tap 2.Private well 3.Public tap 96. Other (specify)		
114	Daily water consumption	_____liter		
115	Do you have latrine?	1. Yes 2. No		If no skip to 117
116	Type of latrine you use? (Observation)	1. Private pit / wooden slab 2. Private slab / cement slab 3. Shared latrine/wooden slab96. Other (Specify)		

117	How do you dispose garbage?	1. Open field disposal. 2. In a pit 3. Composting 96. Other (specify)	
118	If you have livestock, do you have separate room for them?	1. Yes 2. No	

PART TWO: CHILD CHARACTERSTICS (Randomly select)

201	Child's sex	1. Male 2. Female	
202	Child's age	_____ Months	
203	Birth interval(space between previous pregnancy)	_____ years	
204	Place of delivery	1. Home 2.Health institution 96. Other (specify)	
205	Gestational age at birth	_____month	
206	Was your child weighed at birth	1. Yes 2. No ⟶	skip to 208
207	How much was the weight?	_____ Grams (card/recall?)	
208	When (NAME) was born, How big was he/she?	1. Very large 2. Larger than average 3. Average 4. Smaller than average 5. Very small	

		99. Don't know	
209	Type of birth	1. Single 2. Multiple/Twin/	
210	Does the child ever been immunized?	1. Yes 2. no ⟶	skip to no 212
211	Vaccines received(See card, if no card available ask them to recall) (More than one answer is possible)	1. BCG(See Scar) 2. Pentavalent vaccine (Number of of doses) 3. Polio vaccine 4. Measles 99. don't know /no card	
212	Vitamin A supplementation in the past six months?	1. Yes 2. No 99. Don't know/not sure	
213	Has the child had diarrhea in the last two weeks	1. Yes 2. No ⟶ 99.Do not know/not sure	skip to 215
214	How frequent in a day	1. Once 2. Twice 3. 3-4 times 4. More than 4 times	
215	Presence of respiratory disease in the last two weeks	1. Yes 2. No 99. Do not know /not sure	
216	Has the child had fever in the last two weeks?	1. Yes 2. No 99. Do not know	
217	Has the child get sick with measles in the last year?	1. Yes 2. No	

		99. Do not know/not sure	
218	Presence of oedema on the child (Observe)	1. Yes 2. No	

PART THREE: CHILD CARING PRACTICE

301	Did you ever breast fed the child (NAME)?	1. Yes ————————————→ skip to 303 2. No	
302	If no, reason for not breastfeeding?	Reason_____	
303	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 99. Don't know/not sure/	
304	At what age did you start feeding other additional food?	_____Month	
305	What do you use to feed the child	1. Bottle 2. Cup 3. Spoon 96.Other (specify)	
306	How many months did you breast-fed the child?	_____Months 99. still breast feeding	
307	For how many months did you exclusively breast-fed the child?	_____Months 99. Don't know/not sure/	
308	Bath taking of the child?	1.daily 2.weekly 96. Other (specify)	

309	Who is usually taking care of the baby feeding?	1. Mother 2. Sister 3. Grand mother 4. House maid 96. Other (specify)	

PART FOUR: MATERNAL CHARACTERSTICS

401	Mother's age in years	_____	
402	Total number of children ever born?	_____	
403	During pregnancy or lactation, did you consume extra food? (the child under the study)	1. Yes 2. No	
404	Health status during the pregnancy?	1. Good 2. Not good/sick	
405	Did you visited health facility for ANC	1. Yes 2. No⟶ skip to 407	
406	How many times you visited health facility for ANC during the pregnancy?	_____times	
407	Do you usually wash your hands before handling food?	1. Yes 2. no	
408	How do you wash your hand?	1. Using water only 2. Using soap some times 3. Using soap always 4. Using ash some times	
409	For how long do you think should a child be breast-fed?	In months_____	

PART FIVE: HOUSEHOLD FOOD INSECURITY MEASURING TOOLS

501	In the past four weeks, did you worry that your household would not have enough food?	0=No(skip to Q502) 1=Yes	....|___|
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?	0=No(skip to Q503) 1=Yes	....|___|
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	0=No(skip to Q504) 1=Yes	....|___|
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 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?	0=No(skip to Q505) 1=Yes	....|___|
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?	0=No(skip to Q506) 1=Yes	....|___|
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?	0=No(skip to Q507) 1=Yes	....|___|

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?	0=No(skip to Q508) 1=Yes	....|___|
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?	0=No(skip to Q509) 1=Yes	....|___|
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?	0=No(skip) 1=Yes	....|___|

509.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	....|___|

PART SIX: ANTHROPOMETRIC MEASURMENTS

S. no	MEASURMENT	Value	remark
601	Childs Date of birth (date/month/year)		
602	Child weight in kilogram		
603	Child height in centimeters		
604	Maternal Weight in kilogram		
605	Maternal Height in centimeter		

የህብረተሰብ ጤና እና ሕክምና ሳይንስ ኮሌጅ

የኢፒዲሞሎጂ ትምህርት ክፍል

የጥናቱ ርእስ: በሆሳዕና ከተማ ከአምስት አመት በታች ያሉ የህፃናት የስነ ምግብ ሁኔታ እና የቤተሰብ የምግብ ዋስትና ፤2005 ኢ.ም

የጥናቱ ቦታ ሆሳዕና ከተማ

የስምምነት ፎርም

የተከበራችሁ የጥናቱ ተሳታፊዎች

እኔ ---------------------- በጅማ ዩኒቨርሲቲ ኢፒዲሞሎጂ ትምህርት ክፍል የሁለተኛ ዲግሪ ተማሪ በሚስራው ጥናት ላይ መረጃ ሰብሳቢ ነኝ:: ከላይ በርዕሱ ለመጥቀስ እንደተመከረው ይህ ጥናት ትኩረት ያደረገው ከአምስት አመት በታች ባሉ የህፃናት የስነ ምግብ ሁኔታ እና የቤተሰብ የምግብ ዋስትና ነው ::: ለዚህም ጥናት የእናንተ የችግሩ ተጋሪዎች ቀና ተሳትፎ በእጅጉ ጠቀሜታ አለው:: እናንተ በዚህ መጠይቅ የምትሰጡት መረጃ ለምርምር እና ለጥናት ከመሆንም አልፎ በችግሩ ዙሪያ ለሚሰሩ መንግስታዊ እና መንግስታዊ ላልሆኑ ድርጅት አንደ አንድ ግብዓት ከማገልገሉ በላይ በአርሰዎ ላይ ምንም አይነት ተፅዕኖ የለውም ሚስጥርን ከመጠበቅም አንፃር በቃለ መጠይቁ ላይ ስምአይፃፍም:: ስለሆነም እርሰዎም በዚህ ጥናት ውስጥ ለተጠየቁት መጠይቆች መልስ እንዲሰጡን በትህትና እጠይቃለሁ:: በመጠይቁ ላይ ላሉ ጥያቄዎችን ያለመመለስ ሙሉ መብት ሲኖረዎት መጠየቁንም በምትፍልጉበት ሰአት መተው ይችላሉ:: ጥያቄ ወይም ቸግር ካለ በስልክ ቁጥር 0913-30-2585 ወይም 047-111-2587 መደወል ይችላሉ::

አመሰግናለሁ፡፡

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

ካልተስማሙ እናመስግናለን (ወደሚቀጥለው ቤት አለፍ)

የመጠይቁ መለያ ቁጥር_____

ቀበሌ_____

የቤት ቁጥር_____

የጠያቂ ስምና ፊርማ_____

የተቆጣሪ 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 ብዙ አስፈላጊ አየደለም፡፡የ እናቲቱን መልስ በትክክል መስማት ፤ ማክበብ አና መፃፍ ያስፈልጋል፡፡የእናቱም ሆነ የልጁ ስም በ መጠይቁ ላይ አይፃፍም፡

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ክፍል አንድ፦ የቤተሰብ ማህበራዊና ኢኮኖሚያዊ ሁኔታዎች፦

ተ.ቁ	ጥያቄ	ምርጫ		ኮድ
101	የቤት አስተዳዳሪ	1. ሴት 2. ወንድ		
102	የጋብቻ ሁኔታ	1.አግብታ የማታታውቅ 2. ያገባች 3.የተለያዩ 4. ሌላ ይገለፅ		
103	የቤተሰብ ብዛት	_____በቁጥር ይገለፅ		
104	ከአምስት አመት በታች የሆኑ ስንት ልጆች እዚህ ቤት አሉ	_____በቁጥር ይገለፅ		
105	የእናት የትምህርት ደረጃ	1. ያልተማረች 2. ከ1-8ኛ ክፍል የተማረች 3. ከ9-12ኛ ክፍል የተማረች 4. ዲፕሎማና ከዛ በላይ ያላት		
106	የአባት የትምህርት ደረጃ	1. ያልተማረ 2. ከ1-8ኛ ክፍል የተማረ 3. ከ9-12ኛ ክፍል የጨረሰ 4. ዲፕሎማና ከዛ በላይ ያለው		
107	የእናት ስራ	1.የቤት እመቤት 2. ገበሬ 3. ነጋዴ 4.በግል ድርጅት የምትሰራ 5. የመንግስት ሰራተኛ 96. ሌላ (ይጠቀስ)		
108	የአባት ስራ	1.ገበሬ 2. የመንግስት ሰራተኛ 3. ነጋዴ 4.በግል ድርጅት የሚሰሩ 5. የቀን ሰራተኛ 96. ሌላ _____ (ይጠቀስ)		
109	ብሔር	1. ሀድያ 2. ከንባታ 3. ጉራጌ 4. አማራ 96. ሌላ(ይጠቀስ)------		
110	ሀይማኖት	1. ፕሮቴስታንት 2. ኦርቶዶክስ 3. ሙስሊም 4. ካቶሊክ 96. ሌላ _____ (ይገለፅ)		
111	የቤት እንስሳቶች አሉአችሁ?(አክብብ)	1. አዎ	0. የለኝም	ምን ያህል(በቁጥ ር ይገለፅ)
	ላም	1	0	_____ _____
	ፍየል እና በግ	1	0	_____

	በሬ	1	0	_____
	ዶሮ	1	0	
112	የሚከተሉት ንብረቶች አላችሁ?(አክብብ)	1. አዎ	0. የለኝም	
	ቴሌቪዥን(የሚስራ)	1	0	
	ሬድዮ(ሚስራ)	1	0	
	ቴፕ/ዲቪዲ	1	0	
	ስልክ(የቤት)	1	0	
	ሞባይል ስልክ	1	0	
	ቡታጋዝ	1	0	
	ኤሌክትሪክ እስቶቭ	1	0	
	ሶፋ	1	0	
	ጠረቤዛ	1	0	
	ወንበር	1	0	
	ዐልጋ	1	0	
	ባይስክል	1	0	
	ሞተር ሳይክል	1	0	
	የስፕሪንግ ፍራስ	1	0	
	የዕስፖንጅ ፍራስ	1	0	
	የ ሳር ፍራሽ	1	0	
	ፍሪጅ	1	0	
113	የመጠጥ ውሃ ከየት ነው ምታገኙት	1. ከቧንቧ (ከግል) 2. ከጉርጓድ 3. ከቦኖ(ከ ህዝብ) 4. ሌላ------------ የጥቀሱ		
114	ምን ያህል ውሃ በቀን ትጠቀማላችሁ	_____ ሌትር		
115	ሽንት ቤት አላችሁ	1. አዎ 2. 2. የለንም		
116	የሽንት ቤት አይነት (ተመልከት)	ı. ዘመናዊ የግል ሽንት ቤት 2. ባህላዊ የግል ሽንት ቤት 3. የጋራ ሽንት ቤት 96. ሌላ (ይጠቀስ)		

117	የቤት ውስጥ ቆሻሻዎችን (ጥራጊዎችን)የት ነው ምትጥሉት	1. ሜዳ ላይ 2. ጉድጓድ ውስጥ 3. ውጭ እናቃጥላለን 96 ሌላ --------------	
118	የቤት እንስሳ ካላችሁ ለእነርሱ የተለየ ማደሪያ አለቸው	1. አዎ 2. የላቸውም	

ክፍል ሁለት፡ የህፃኑ ሁኔታ

ተ.ቁ	ጥያቄ		
201	የህፃኑ ፆታ	1. ወንድ 2. ሴት	
202	የህፃኑ እድሜ	_____ ወር	
203	በስንት ዐመት ልዩነት ነው የወለድሽው(የመጀመርያ ልጅ አይካተትም)	_____	
204	የተወለደው የት ነው	1. ጤና ተቋም 2. ቤት	
205	ህፃኑ ከስንት ወር እርግዝና በሁላ ነው የተወለደው	_____ ወር	
206	ልጅሽ እንደተወለደ/ደች ኪሎ ተለክቶ ነበር	3. አዎ 4. አልተለካም ➜	መልሱ 2 ከሆነ ወደ ጥያቄ 208 እለፍ
207	ከተለካ እንደ ተወለደ ስንት ኪሎግራም ነበር ክብደቱ?	_____	
208	ኪሎው ማይታወቅ ከሆነ በግምት ምን ያህል ትልቅ ነበር?	1. በጣም ወፍራም 2. ወፍራም 3. መሀከለኛ 4. ትንሽ ነበር	
209	መንታ ነበር የወለድሽው?	1.አዎ 2. አይደለም	
210	ህፃኑ ክትባት ተከትቧል	1.አዎ 2. አልተከተበም ➜	መልሱ 2 ከሆነ ወደጥያቄ ቁጥር 212 እለፍ

211	የወሰደው ክትባት (የህጻኑን የክትባት ካርድ እይ) ከሌለ እንዲያስታውሱ ጠይቅ) ከአንድ በላይ መልስ ይፈቀዳል	1. ቢሲጄ (ከንዳቸው ላያያለውን ጠባሳ ተመልከት) 2. ፔንታ (ስንት ጊዜ እንደወሰደ ጠይቅ) 3. ፖሊዮ(ካርድ) 4. ሚስልስ (ካርድ ተመልከት)	
212	በዚህ ስድስት ወር ውስጥ የቫይታሚን ኤ እንክብል ተሰጥቶት ነበር	1.አዎ 2. አልወሰደም 99.አላውቅም	
213	ባለፈው ሁለት ሳምንት ውስጥ ህጻኑ ተቅማጥ ይዞት ነበር	1.አዎ 2. አልያዘውም ———→	መልሱ 2 ከሆነ ወደ ጥያቄ ቁጥር 215 እለፍ
214	በቀን ምን ያህል ጊዜ ያስቀምጠዋል	1. አንዴ ብቻ 2. ሁለቴ 3. ከሦስት እስከ አራት ጊዜ 4. ከ አራት ጊዜ በላይ	
215	ባለፈው ሁለት ሳምንት ውስጥ ህጻኑ የማገልና የአተነፋፈስ ችግር ነበረበት	1. አዎ 2. አልነበረበትም	
216	ባለፈው ሁለት ሳምንት ውስጥ ህጻኑ ትኩሳት ነበረው	1. አዎ 2.አልነበረውም	
217	ህጻኑ ከዚህ በፊት ኩፍኝ ይዞት ያውቃል	1. አዎ 2. አልያዘውም	
218	በሁለቱም እግሮቹ ላይ ሚሰረጉድ እብጠት አለው ?(ተመልከት)	1. አዎ 2. የለም	

ክፍል ሦስት፡ የህጻኑ እንክብካቤ ሁኔታ

301	ህጻኑን ጡት አጥብተሽው ታውቂያለሽ	1. አዎ ———→ 2. አላጠባሁትም	ወደ ጥያቄ ቁጥር 303
302	ካላጠባሽ ለምን (ምክኒያቱ ይገለፅ)	_____	
303	ህጻኑ ከተወለደ ከስንት ሰዓት በኃላ ነው ጡት የሰጠሽው	1. ወዲያው እንደተወለደ 2. ከ------ ሰዓትበኃላ(ከ24 ሰዓት ካነሰ ይጠቀስ) 3. ከ------ቀን በኃላ 99. አላውቅም (እርግጠኛ አይደለሁም)	

304	በስንት እድሜው ነው ሌላ ምግብ (ተጨማሪ ምግብ) መስጠት የጀመርሽው	_____	
305	ልጁን በምን ዕቃ ነው የምትመግቢው	1. በጡጦ 2. በኩባያ 3. በማንኪያ 96. ሌላ------ይገለፅ	
306	ህፃኑን ስንት ወር ጡት አጠባሽው	_____ ወር	
307	ጡት ብቻ ለምን ያህል ጊዜ አጠባሽው (ሰጠሽው)	_____ ወር 99.አላውቅም	
308	የህፃኑን ሰውነት የምታጥቢው በስንት ቀን ነው	1.በየበቀኑ 2. በሳምንት 96. ሌላ(ይገለፅ)	
309	ህፃኑን ማነው ሚንከባከበው	1. እናቱ 2. አያቱ 3. እህቱ 4. የቤት ሰራተኛ	

ክፍል አራት፡- የእናቱ ሁኔታ የሚያሳይ መጠይቅ

401	የእናት እድሜ	_____	
402	ስንት ልጅ አለሽ?	_____	
403	በእርግዝና ጊዜ ተጨማሪ ምግብ ትመገቢ ነበር?	1. አዎ 2. አልመገ ብም	
404	የጤናሽ ሁኔታ በእርግዝና ወቅት	1. ጥሩ ነበር 2. ጥሩ አልነበረም(ታምሜ ነበር)	
405	በጤና ተቋማት የእርግዝና ክትትል አርገሽ ነበር?	1. አዎ 2. አልሄድኩም	
406	የእርግዝና ክትትል አርገሽ ከነበር ለምን ያህል ጊዜ?	_____	
407	ሁሌ ምግብ ከመስራትሽ በፊት እጅሽን ትታጠቢያለሽ?	1. አዎ 2. አልታጠብም	
408	እጅሽን በምንድነው የምትታጠቢው?	1. በውሃ ብቻ 2. በውሃና በሳሙና 3. ሁሌ በሳሙና 4. በአመድ (አንዳንዴ ሳሙና ከሌለ)	
409	በአንቺ አመለካከት (አስተሳሰብ) ህፃን ልጅ ስንት ወር ጡት መጥባት አለበት	_____ ወር	

ክፍል አምስት፦ በቤተሰብ ውስጥ የምግብ ዋስትናን የተመለከቱ ጥያቄዎች

501	ባለፈው ወር በቁ ምግብ ቤት ውስጥ አይኖርም ብለሽ ተጨንቀሽ ነበር?	1. አዎ 2. አልሰጋሁም	
501 a.	አዎ ከሆነ ለ501 መልስሽ በወር ውስጥ ምን ያህል ጊዜ?	1. በጣም ትንሽ ጊዜ (አንዴ ወይ ሁለቴ) 2. አንዳንዴ(2-10 ጊዜ) 3. ሁል ጊዜ(ከ አስር ጊዜ በላይ)	
502.	በምግብ ወይም በገንዘብ እጥረት ምክንያት አንቺ ወይም በቤተሰብ ውስጥ የመረጣቹትን ምግብ መመገብ ያልቻላቹበት ጊዜ ነበር?	1. አዎ 2. የለም	
502.ሀ	አዎ ከሆነ መልሱ ለ502 ለምን ያህል ጊዜ?	1. በጣም ትንሽ ጊዜ (አንዴ ወይ ሁለቴ) 2. አንዳንዴ(2-10 ጊዜ) 3. ሁል ጊዜ(ከ አስር ጊዝ በላይ)	
503	ባለፈው ወር (አራት ሳምንት) ውስጥ የመግዛት አቅም ስላልነበራችሁ በቤተሰብ ውስጥ የተወሰነ የምግብ አይነት በልታቹ ነበር?	1.አዎ 2. የለም	
503.ሀ	አዎ ከሆነ መልስሽለ 503 ለምን ያህል ጊዜ?	1. በጣም ትንሽ ጊዜ (አንዴ ወይ ሁለቴ) 2. አንዳንዴ(2-10 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. አልነበረም	
504.ሀ	አዎ ከሆነ ለ504 ለምን ያህል ጊዜ	፩. በጣም ትንሽ ጊዜ (አንዴ ወይ ሁለቴ) 2.አንዳንዴ(2-10 ጊዜ) 3.ሁል ጊዜ(ከ አስር ጊዜበላይ)	
505	ባለፈው ወር ቤት ውስጥ በቂ ምግብ ስለሌለ ከሌላቸው ጊዜ ያነሰ ምግብ የተመገበ ሰው አለ?	1. አዎ 2. የለም	
505.ሀ	አዎ ከሆነ መልስሽ ለ 505ምን ያህል ጊዜ?	1. በጣም ትንሽ ጊዜ (አንዴ ወይ ሁለቴ) 2. አንዳንዴ(2-10 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.ሀ	ካለ(506) ለምን ያህል ጊዜ?	1. በጣም ትንሽ ጊዜ (አንዴ ወይ ሁለቴ) 2. አንዳንዴ(2-10 ጊዜ)	

			3. ሁል ጊዜ(ከ አስር ጊዜ በላይ)	
507	ባለፈው ወር ውስጥ ምንም አይነት ምግብ ቤት ውስጥ ሳይኖር ቀርቶ ያውቃል (ገንዘብ ስለሌለ)?	1.አዎ 2. አያውቅም		
507.ሀ	አዎ ከሆነ (507)ለምን ያህል ጊዜ?		1. በጣም ትንሽ ጊዜ (አንዴ ወይ ሁለቴ) 2. አንዳንዴ(2-10 ጊዜ) 3. ሁል ጊዜ(ከ አስር ጊዜ በላይ)	
508	ባለፈው ወር ውስጥ ምግብ ስለሌለ ከቤተሰብ ሃይበላ ያደረ አለ?	1. አዎ 2.የለም		
508.ሀ	አዎ ከሆነ (508)ለምን ያህል ጊዜ?		1. በጣም ትንሽ ጊዜ (አንዴ ወይ ሁለቴ) 2. አንዳንዴ(2-10 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		
509.ሀ	አዎ ከሆነ (509)ለምን ያህል ጊዜ?		1. በጣም ትንሽ ጊዜ (አንዴ ወይ ሁለቴ) 2. አንዳንዴ(2-10 ጊዜ) 3. ሁል ጊዜ(ከ አስር ጊዜ በላይ)	

ክፍል ስድስት፡የ እድገት ክትትል መለኪያዎች

601	ህፃኑ የተወለደበት ቀን ቀን/ወር/ኢ.ም		
602	የህፃኑ ክብደት(በ ኪ.ግ)		
603	የህፃኑ ቁመት(በ ሴ.ሜ)		
604	የእናቱ ክብደት(በ ኪ.ግ)------------------		
605	የእናቱ ቁመት(በ ሴ.ሜ)---------------------		

PRINCIPAL COMPONENT ANALYSIS FOR HOUSEHOLD WEALTH INDEX

Total Variance Explained

Component	Initial Eigen values			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.671	18.356	18.356	3.671	18.356	18.356	2.443	12.217	12.217
2	1.969	9.847	28.203	1.969	9.847	28.203	2.239	11.197	23.413
3	1.841	9.204	37.407	1.841	9.204	37.407	1.977	9.883	33.297
4	1.168	5.840	43.247	1.168	5.840	43.247	1.631	8.154	41.451
5	1.126	5.631	48.878	1.126	5.631	48.878	1.486	7.428	48.878
6	.986	4.932	53.810						
7	.941	4.705	58.515						
8	.898	4.489	63.004						
9	.803	4.015	.6019						
10	.783	3.916	70.934						
11	.763	3.815	74.749						
12	.726	3.631	78.380						
13	.686	3.428	81.808						
14	.634	3.170	84.978						
15	.603	3.013	87.991						
16	.542	2.712	90.703						
17	.528	2.641	93.344						
18	.478	2.388	95.733						
19	.440	2.202	97.935						
20	.413	2.065	100.000						

Extraction Method: Principal Component Analysis.