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NUTRITIONAL STATUS AND MAJOR DETERMINANTS OF MALNUTRITION IN CHILDERN UNDER FIVE YEARS OF AGE IN HORO DISTRICT, HORO GUDURU WOLLEGA ZONE OF OROMIA REGIONAL STATE, ETHIOPIA

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ABSTRACT

Child malnutrition is one of the most serious public health problems in the developing world including Ethiopia. Recent survey in the country show that 38% of children are underweight, 10.5% wasted and 46.5% are stunted. However, underlying variations of these nutritional indicators and major determinants among regions and localities is poorly understood. The main objective of the study was to investigate the nutritional status and major determinants of child malnutrition under five age and identify the various causes and their relative contributions in urban and rural settings. A comparative cross sectional study was conducted in Horo district, Oromia region on a total of 493 children (321 from rural and 172 from urban areas) under five years of age. A multistage systematic sampling method was employed to collect quantitative data using structured questionnaire and anthropometric measurements. The study variables include; socio-economic and demographic characteristics, child and maternal related variables, feeding practice. Data were processed using SPSS for analysis. NCHS reference population standard of WHO utilized to convert height and weight measurements into Z-scores of the H/A, W/H and W/A indices considering age and sex of the children. Bivariate and multivariate logistic regression analysis methods were used to identify major determinants of malnourished children under five years and nutritional status to account for potential confounding factors. The result of the study indicated that 31.2 % of the children were stunted, 16.6% were wasted, and 21.4%t underweight. Nutritional status of severe stunting, wasting and underweight respectively were 15.4%, 6.99%, and 8.23%. No significant variation of child malnutrition by residence was observed. Main determinant factors of wasting were childhood illness indicated by fever, low household income and maternal lack of education, Low birth size of children, paternal lack of education, large family size on use of money and lack of animals were associated with chronic malnutrition (stunting). ARI in children, deficiency of windows of houses and low maternal BMI (<18.5) are most important determinants of underweight. Rural resident children were more exposed to nutritional risk factors than their urban counterparts. This study indicated that acute nutritional (wasting) problem is highly prevalent in the area and stunting problem is also of particular concern. It is recommended that prevention and treatment of children illness should be enhanced and feeding practice centers be established in short term. Moreover, women empowerment and efforts to alleviate poverty are crucial if the problem of malnutrition is to be solved in the long run gap of research.

KEYWORDS: Child malnutrition, SPSS, NCHS, Prevention and treatment.

1. INTRODUCTION

1.1. Background of the study

Nutritional status is the science that examines the relationship between diet and human health at different life spans. Among those, nutritional status is a major determinant of the health and well-being of children (DHS, 2005). Poor nutritional status is associated with inadequate or unbalanced diets intake and it is among the determinants as well as the consequences of chronic illnesses. Obviously, the nutritional status of children is closely related to the economic conditions of their family, which are a determining factor for both food

consumption and health care. But recent research suggests that other family-related factors like household wealth being and structure.

Hierarchies based on gender and generations determine intra-household relationships and decision-making processes in many societies (Mason and Smith, 2003) in particular, the economic and non-economic resources which are invested in children's growth may be differentiated according to the position which they and their mother hold in the family (relationship with the head of the family who may or may not be a parent of the child; children living with both, or only one, or none of their parents; number of brothers and sisters; presence of authoritative persons outside the family nucleus; etc.). From another point of view, it can be argued that in families in which the mother plays a role in decision-making and has more autonomy of action, "maternal altruism" influences positively the proportion of family resources destined to children (Desai and Johnson, 2005). Demographic and Health Surveys provided good internationally comparable data that offer the possibility of exploring at least some aspects of the relationships between children's nutritional status and the family: DHS obtained anthropometric measurements on children's height and weight that make possible the construction of internationally accepted indicators of nutritional status – weight by age, height by age and weight by height or BMI (Body Mass Index)– each of which illuminate a particular nutritional aspect. DHS also gathered a wealth of information on the structure of households, contained in the "household data sets", and asked questions about the decisional power of women data sets. That analyses, which refer to Ethiopia (DHS, 2005), and India (DHS, 1998-99).

The effects of malnutrition on human performance, health and survival have been the subject of extensive research for several decades and studies show that malnutrition affects physical growth, morbidity, mortality, cognitive development, reproduction, and physical work capacity (Pelletier .DL and Frongillo EA,2002).

Malnutrition is an underlying factor in many diseases in both children and adults, and it contributes greatly to the disability-adjusted life year's worldwide (Murray, CJL and AD Lopez, 1996).

Malnutrition is particularly prevalent in developing countries, where it affects one out of every three preschool-age children (UN, 2004). A well-nourished child is one with access to adequate food supply, care and health. Such a child will have weight and height measurements that compare very well with the standard normal distribution of heights (H) and weights (W) of healthy children of the same age and sex. Thus, the best way to evaluate the nutritional status and overall health of a child is to compare the child's growth indices with the set cut-off points in the standard normal distribution of well-nourished children that are associated with adequate growth. (Deonis M, Monteiro C, Akre J and G Clugston, 2003).

Factors that contribute to malnutrition are many and varied. The primary determinants of malnutrition, as conceptualized by several authors relate to unsatisfactory food intake, severe and repeated infections, or a combination of the two (UNICEF, 1998, and WHO, 1994). The interactions of these conditions with the nutritional status and overall health of the child - and by extension - of the populations in which the child is raised have been shown in the UNICEF Conceptual framework of child survival (UNICEF, 1998). Briefly, the model characterizes the correlates of malnutrition as factors that impair access to food, maternal and child care, and health care. It is these very factors that impact the growth of children. Consequently, the assessment of children's growth is a suitable indicator for investigating the wellbeing of children, and as well as for examining households' access to food, health and care (Deonis M, Monteiro C, Akre J and G Clugston, 2003; UNICEF, 1998).

Children under 5 years of age in Ethiopia experience one of the highest rates of malnourishment in the DHS of Ethiopia 2005. From this Survey, it is found that the rural children continue to have nutritional status outcomes than urban children. Therefore the nutritional status, major determinants of malnutrition of these children under five years, and their household characteristics and all significant externalities associated with household residential location that impact urban-rural differences in nutritional status and major determinants of malnutrition of children under five years of Horo District of Horo Guduru Wollega Zone would be investigated this study.

1.2. Statement of the Problem

Child malnutrition is among the most serious public health problem in Ethiopia. Study Result of the 1992 national rural nutrition survey indicated that about 64% of all children aged 6-59 months were chronically malnourished in the country (Albino, 1990). The incidence of underweight in Ethiopian children has been consistently reported at about 45%, which compares the average 33% incidence of underweight children in sub-Saharan Africa (WHO, 2000). This makes prevalence of underweight children in Ethiopia likely to be the highest in Africa (Deon is M, Monteiro C, Akre J and G Clugston, 2003).

Furthermore One of the five health outcome targets (out of eleven total targets for health) given st by the World Health Organization (WHO) in its recently revised "Health for all in the 21 century" has envisaged to reduce the percentage of children under five years who are stunted to be less than 20% in all specific sub-groups within countries by the year 2020 (FAO/UN, 1999).

Improvement in nutritional status of children has been least in Africa, where 9 of the 31 countries with more than one of the national survey exhibit a rising trend in stunting rates and 9 others shows no change (FAO/UN, 1999; WHO, 1996; UN, 2000). Over the past decades, Ethiopia has consistently faced severe pre-school child malnutrition problems, with malnutrition rates ranking amongst the worst in sub-Saharan Africa. While this has been sufficiently documented by case studies and national official surveys. The reasons behind it are still poorly understood. More than one quarter of the children born does not reach the age of five, the fifth mortality rate in the world (DHS, 2001).

No program carried out in health facilities and regular nutrition intervention conducted concerning nutrition status assessment in most part of the country (Serventi M, DalLago AM and DN Kimaro, 1995). Therefore the current study focuses on assessment of the nutritional status and major determinants of malnutrition of children under five years in the study area. Furthermore according to researcher experience and observation Horo Districts have seemed a problem nutritional status and major determinants of malnutrition of children. A considerable number of children become malnourished in the study area.

1.3. OBJECTIVES OF THE STUDY

1.3.1. General objective

To investigate the nutritional status and major determinants of malnutrition in children under five years of age in Horo District, Horo Guduru Wollega Zone of Oromia, Ethiopia.

1.3.2. Specific objectives

The Specific objectives of the study are

- To identify the nutritional status of children under five year of age in Horo District.
- To identify the major determinants factors of malnutrition (stunting, wasting and under nutrition) of children under five years in the study area.
- To compare the urban and a rural areas of nutritional status and major determinants factors of malnutrition of children under five years of age in the study areas.

1.4. Research questions

In order to arrive at successful achievement with the desired, objectives of the research the following questions are formulated and will be answered in the study.

- What % of children under five years is malnourished?
- What % of households is classified as, A. wealthy income B. middle income C. poor income?
- What are the major determinants of malnutrition in the study area?
- How does the relation between wealthy statuses of the house hold (mothers) and family size of the house hold relate to state of nutrition of children under five years?
- How does food habit and feeding practice of children related to the prevalence of malnutrition of children less than five years?

1.5. Significance of the study

The purpose of the study is to assess the nutritional status and major determinants of malnutrition of children under five years of age, in the study area.

Assessment of nutritional status and major determinant of malnutrition is very important to know their awareness to find necessary solution for problems occur due to malnutrition and delivery related problems.

To provide tangible report to the concerned bodies about the status of the problem to initiate some recommended measure.

It also tries to describe the reason behind of the children malnourished discontinuation of their utilization and to recommend based on the finding to concerned bodies to solve problems. Finally, the study may initiate further researcher who interested to conduct study on this area.

1.6. Limitation of the Study

As this research is based on the secondary data and utilizes physical/body measurements and age of children to asses nutritional/health outcomes, a couple of problems might affect the analysis. For example, it is expected that the age data could have been misreported by parents for various reasons and this might be the reason for the biologically "implausible" z-scores values given.

Similarly, in addition to the problems associated with data editing and entry, wrong data on height and weight could have been registered by the enumerator out of problems with measuring equipment. Also, children may not have been available for measurement in some of the survey rounds. Thus, these and other associated problems resulted in missing data which has led to dropping of these children from the analysis. This in turn resulted in a reduction in sample size and the possibility of introducing a selectivity bias into the estimates.

On the other hand, this research is entirely dependent upon quantitative data. Therefore, these and other similar problems could have affected the quality of the data and hence the statistical results, which in turn might affect the result, have led to wrong conclusions.

Time and financial constraint also the limiting factors.

2. REVIEW OF THE LITERATURE

2.1 Concepts and Definitions

The words "nutrition" and "health" are used interchangeably here for both outcomes are too related that it is difficult to disentangle one from the other, and

thus both may signify the same thing when children are considered. Though the word "malnutrition" is associated with both under nutrition and over nutrition (Smith and Haddad, 2000), in this paper it is meant to refer to under nutrition. The word "Anthropometric" is generally meant to represent the measure of people's growth indicators such as weights and heights (related to their age and sex). It is used for growth assessment and is a single measurement that best defines the health/nutritional status of a child (Blossner, *et. al*., 2005). According to this measure, the nutritional/health status of children is determined by comparing growth indicators with the distribution of the same indicators for "healthy" reference group, and identifying "extreme" or "abnormal" departures from this distribution.

The international reference standard that is most commonly used and recommended by the (WHO) is that of the data on the weights and heights of a statistically to See for e.g. (Behrman and Deolalikar, 1988; Strauss and Thomas, 1998; Glewwe, 1999; Schultz, 2002; Chaudhuri, 2003) valid population (US National Center for Health Statistics (NCHS)) of healthy infants and children in the US. There are three ways of expressing these comparisons: Z-score (standard deviation (SD) score), percent of median, and percentile. But the interest here is on the SD score (Z-score) and it is defined as the difference between the value for an individual and the median value of the reference population for the same age, height, or weight divided by the standard deviation of the reference population. Based on this comparison method, the three most commonly used anthropometric indicators for infants and children are:

- Weight-for-height (W/H): measures body weight relative to height and is normally used as an indicator of current nutritional status. Extreme cases of low W/H (Z-score below -2 SD) are commonly termed as "wasting".
- Height-for-age (H/A): reflects cumulative linear growth. Extreme case of low H/A (Z-score below -2 SD) is referred to as "stunting."
- Weight-for-age (W/A): reflects body mass relative to age. The severe case of low W/A (Z Score below -2SD) is commonly referred as "underweight" Depending on the value of the Z-scores of the above indicators, the degree of malnutrition could be categorized as; low (normal), medium (mild), high (moderate) and, very high (severe).

2.2. Children (preschool children) nutritional status

In Ethiopia, the nutritional status of children approximately 10 percent of children born will die before their first birthday and 17 percent will die before their fifth birthday (CSA and ORC Macro, 2001). According to formulas developed by (Pelletier *et al*., 1994), 57 percent of under-five mortality in Ethiopia is related to severe and mild to moderate malnutrition (ORC Macro, 2001). The consequences of malnutrition in children also include poor physical development and limited intellectual abilities that diminish their working capacity during adulthood.

2.2.1. Household economic status

In the case of women, the economic nutritional status of a household is also one of the most important determinants of child nutritional status (UNICEF, 1990).

2.2.2. Child morbidity

Diarrhea and other infectious diseases manifested in the form of fever affect both dietary intake and utilization, which may have a negative effect on improved child nutritional status. A comparative study on children's nutritional status (Sommerfelt *et al*., 1994) Indicated that stunting was highest among children with recent diarrhea.

2.2.3 Education of mother

Education is one of the most important resources that enable women to provide appropriate care for their children, which is an important determinant of children's growth and development (Engle and Menon, 1996). Studies in the Philippines (Aguillion et al, 1982), Libya (Popkin and Bisgrove, 1988), Uganda (Statistics Department and Macro International Inc., 1996), and Ethiopia (Yimer, 2000; Genebo et al., 1999) show a decreased incidence of malnutrition among young children with an increase in the level of mothers' education.

2.2.4. Age of child

Children's nutritional status is also more sensitive to factors such as feeding/weaning practices, care, and exposure to infection at specific ages. A cumulative indicator of growth retardation (height-for-age) in children is positively associated with age (Anderson, 1995, Aschalew, 2000). Local and regional studies in Ethiopia have also shown an increase in malnutrition with increase in age of the child (Yimer, 2000; Genebo et al., 1999; Samson and Lakech, 2000).

2.2.5. Birth interval of the child

Closely spaced pregnancies are often associated with the mother having little time to regain lost fat and nutrient stores (ACC/SCN, 1990). Higher birth spacing is also likely to improve child nutrition, since the mother gets enough time for proper childcare and feeding. Studies in developing countries showed that children born after a short birth interval (less than 24 months) have higher levels of stunting in most countries where DHS surveys have been conducted (Sommerfelt *et al*., 1994; and MI, 1999).

2.2.6. Birth order

It is expected that parents give less attention to older children when they give birth to a new child who needs much attention and care. One study showed that stunting is rare in birth order 2-3 (Sommerfelt et al., 1994), and higher birth order (5+) is positively associated with child malnutrition (Jeyaseelan, 1997).

2.2.7. Birth weight standards

Birth weight is regarded as one of the best indicators of overall nutritional status of the infant and its well-being. The normal birth weight range is considered to be between 2500 and 4200 g. above and below this range; babies have an increasing risk of stillbirth and disease in their first year of life. The World Health Organization has estimated that around 20.75 million low birth weight (LBW) babies, <2500 g, are born each year, 94% of whom are born in developing countries. However birth weight is not the sole criterion for risk; gestational age and intra-uterine growth are equally important. (De Groot, L**.** 1999).

2.3. Conceptual Framework

A theoretical framework for the determinants of nutrition is essential in order to analyze these variables in an organized manner and to be able to interpret empirical studies. (Behrman and Deolalikar, 1988). Therefore, the conceptual framework guiding the empirical analysis for this study is based on the United Nations Children's Fund's framework for the causes of child malnutrition (UNICEF 1990, 1998) and the subsequent extended model of care as presented in (Engel, Menon, and Haddad,1999), and cited in (Smith and Haddad,2000). It presents a useful generalized understanding of how child's nutritional status and/or health are the outcomes of a multisectoral development problem that can be most effectively analyzed in terms of immediate (the most proximate level), underlying, and basic (the deepest level) causes. It is shown in the framework that a child's nutritional status is the result of the interactions between the child's dietary intake and the child's health status, at the immediate level. (Smith and Haddad, 2000)

2.4. Determinants of Child nutritional Status

Various studies in different/same countries may find different results over the importance of the determinant factors behind children's nutrition outcomes. Estimates may differ depending on various factors including the nature of the data and estimating methodology. As is shown in the theoretical framework, the determinants of child health/nutrition can be grouped into three categories namely child characteristics, household characteristics and community characteristics.

Child characteristics may include dummies for age, gender, birth interval, birth order of the child etc. Parent and household characteristics may include parental schooling, age, health and nutritional status; household size and composition, household economic welfare, social capital etc. Access to services including sanitation facilities, clean water and healthcare facilities at community as well as at household level is important for their direct and spillover effects on child health/nutrition. Therefore, the following two sections review the empirical literature on Ethiopia and the rest of the world based on these three categories.

2.4.1. Child characteristics

Most studies report that child characteristics such as age, sex and birth order are important determinants. Some of them found that child height for age and weight-for-height vary substantially with age where by malnutrition rises with age in the first two years of life but then levels off (Strauss, 1990; Glewwe, 1999; Dercon and Hoddinott, 2003).

2.4.2. Parental and household characteristics

Parental and household characteristics such as parental age, education level, health knowledge, height, household size, household resources etc are all important in child nutrition outcomes. However, the most controversial result comes from parental education. Most of the studies reported maternal education to have a positive and statistically significant coefficient (Thomas, 1994; Chaudhuri, 2003; and Escobal, 2005).

2.4.3. Community characteristics

Access to services including sanitation facilities, clean water and healthcare facilities at community as well as at household level is important for their direct and spillover effects on child health/nutrition. Using Young Lives data obtained from a stratified nationwide sample of Peruvian 1,980 children aged between 6 and 18 months,(Escobal *et al*.,2005) Tried to explore the interaction of public assets, private assets and community characteristics and its effect on early childhood height-for-age. The finding is that service availability (electricity, piped water and sewerage) at the household level significantly affects height-for-age where mothers are less educated but not for more educated mothers.

2.5. Malnutrition

Malnutrition refers to disorders resulting from an inadequate diet or from failure to absorb or assimilate dietary elements. Stunting (low height-for-age) is a physical indicator of chronic or long term malnutrition and is often linked to poor mental development. Stunting is a cumulative process of poor growth that primarily occurs before the age of three years and is not easily reversed. This infers that these first years of life provide a window of opportunity for effective nutritional programming. Underweight (low weight-for age) is an indicator of both chronic and acute under nutrition (Frongillo EAJ, 1999). Wasting (low weight-for height) is an indicator of acute under nutrition.

2.5.1. Major Determinants of Malnutrition

Nutritional status of children is a manifestation of a host of factors including household access to food and distribution of this food with in the household, availability and utilization of health services, and care provided to the child. There is a general consensus today that a complex set of causes determines malnutrition ranging from factors as fundamental as political instability and slow economic growth to highly specific ones such as infectious diseases.

The international conference on nutrition classifies the many determinants of malnutrition in to three main factors. These are the immediate causes, underlying causes and, the basic causes. Inadequate and/or inappropriate dietary intake and infectious diseases are the immediate direct causes, while these interns are related to a number of determinant factors such as insufficient access to food, child care, water supply and environmental sanitation which are underlying causes. Political, cultural, religious, economic and social system including women's status in the society is considered to be the basic factors/causes (Gugsa Yimer, 2000; DHS 2001; WHO, 2000).

2.5.2. Measuring Malnutrition

A Variety of methods are commonly used for assessing the nutritional status of populations based on anthropometric, measurements. Anthropometric measurements (body dimensions and composition) are often used as proxies for assessing the eventual extent and severity of malnutrition. They are strong and feasible predictors at individual and community level of subsequent ill health, functional impairment and/or mortality. Anthropometry-based nutritional assessment has the advantage of being a universally applicable, inexpensive and noninvasive method. This procedure is also applicable to large sample sizes and helps to identify target groups of population for intervention, as a tool for nutritional surveillance, and in evaluation of success or failure of interventions directed towards economic and environmental factors underlying nutritional deprivation (Alemu M., Belele T, 2005, DHS, 2005, Chevassus-Agnès; FAO 1999, and Sununtar S.; 2005).

The most commonly used anthropometric measurements are four; body weight, height, age and sex of each individual, which allow calculating the following indices:

Weight-for-age; reflects body mass relative to chronological age; Often used if the child is normal, under or over weight. It is a simple index but does not take height into account. It is influenced by both the height (height-for-age) and weight (weight-for-height) of a child and its composite nature makes interpretation complex. For example, weight-for-age fails to distinguish between short children of adequate body weight and tall, thin children. However, in the absence of significant wasting in a community, similar information is provided by weight-for-age and height-for-age as both reflect the long-term health and nutritional experience of the individual or population.

Under weight is the most common assessment of child nutrition status. It is a good indicator for child under two years because of the need to do precise measurement of weight for these age groups.

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

Provided there is no severe food shortage, the prevalence of wasting is usually below 5 percent, even in poor countries. A prevalence exceeding 5 percent is distressing given a parallel increase in mortality that soon becomes apparent. On the severity index, prevalence rates between 10-14 percent are regarded as serious, and above or equal 15 percent as critical. Typically, the prevalence of low weight-for-height shows a peak in the second year of life.

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

The world-wide variation of the prevalence of low H/A is considerable, ranging from 5 percent to 65 percent among the less developed countries. In many such settings, prevalence starts to rise at the age of about three months; the process of stunting slows down at around three years of age, after which mean heights run parallel to the reference curve.

Therefore, the age of the child modifies the interpretation of the findings: for children below 2-3 years, low H/A probably reflects a continuing process of "failing to grow" or "stunting"; for older children, it reflects a state of "having failed to grow" or "being stunted".

For children under age five, the Z-score classification system is used for population-wide assessments including surveys and nutrition surveillance. For consistency with clinical screening, prevalence-based data are commonly reported using cut-off values, usually at minus two and plus two Z-scores from the median in the reference population. This implies that slightly more than 2 percent of the reference population will be classified as "malnourished" even if they are truly "healthy" individuals with no growth impairment.

2.5.3. Evidence from Ethiopia

The prevalence of malnutrition in Ethiopia has been and still is very high for so many years. As part of welfare monitoring survey, the central statistical authority of Ethiopia is permanently providing data on nutritional status of children every two years since 1996.

According to WMS (2004) report, about 10.4 million children (constituting 5.1 million female and 5.3 male) between the ages of 3-59 months are considered for anthropometric measurements.

The following table provides the prevalence of Wasting, Stunting, and Underweight by gender and survey year for the country.

Table 1: profile of child malnutrition by gender, place of residence and survey year.

	Underweight			Wasting			Stunting		
	Boys	**Girls**	**Both**	**Boys**	**Girls**	**Both**	**Boys**	**Girls**	**Both**
Country Level									
1996	47.8	42.9	45.4	7.8	6.9	7.3	67.6	65.7	63.8
1998	46.5	43.2	44.9	10.7	8.4	9.6	55.9	54.7	53.5
2000	45.9	44.1	45.0	10.2	8.9	9.6	58.1	56.7	55.3
2004	37.6	36.7	37.1	8.6	7.9	8.3	48.3	45.5	46.9
Rural									
1996	49.3	44.0	46.7	8.0	7.2	7.6	68.4	64.8	66.6
1998	47.9	44.7	46.3	10.8	8.6	9.7	57.4	55.0	56.2
2000	47.6	45.6	46.7	10.4	9.2	9.8	59.4	56.3	57.9
2004	39.1	38.3	38.7	8.8	8.1	8.4	49.9	47.1	48.5
Urban									
1996	35.1	33.6	34.4	6.4	4.1	5.3	61.0	55.5	58.4
1998	32.8	28.7	30.7	9.8	7.2	8.5	42.1	38.9	40.5
2000	26.7	27.4	27.0	7.0	5.8	6.4	44.2	44.7	44.4
2004	21.5	20.0	20.8	6.9	6.0	6.5	31.1	27.9	29.6

Source: Welfare Monitoring Survey, Analytical Report, June 2004.

As can be seen from Table 1, the results of successive surveys have indicated that over time there is a tremendous decrease in the rate of malnutrition measured by percentages of stunting and underweight throughout the country. At country level, stunting exhibits a sharp decline over the given period; from 65.7 percent in 1996 to 46.9 percent in 2004 while the level of underweight over the period (1996 to 2000) is shown to be relatively stable. Yet, there is a sharp decline in the level of underweight from year 2000 to 2004 which is also evidenced by the prevalence rate of both stunting and wasting. Nevertheless, the prevalence of wasting has slightly risen from 1996 (7.3 percent) to 1998 and 2000 (9.6 percent) for both male and female children, though this figure has come down to 8.3 percent in year 2004.

Although table 1 indicates child malnutrition to be declining over time in both urban and rural areas, the prevalence of malnutrition is higher in rural areas implying that rural children are more prone to all kinds of malnutrition. Similarly, in terms of gender, boys are indicated to be more vulnerable to malnutrition than girls with respect to the three indices over the given period (WMS, 2004).

In Oromia region prevalence of child malnutrition indicated that 34.4% are underweight with 11% severe underweight, 9.6% of the children are wasted (2.4 % severe wasting) and 41 % of the children are stunted with 21.8 sever stunting (DHS 2005).

2.5.4. Common forms of malnutrition in Ethiopia

Malnutrition is a major public health problem in many developing countries. It is one of the main health problems facing women and children in Ethiopia. The country has the second highest rate of malnutrition in Sub-Saharan Africa (SSA). Ethiopia faces the four major forms of malnutrition: acute and chronic malnutrition, iron deficiency anemia (IDA), vitamin A deficiency (VAD), and iodine deficiency disorder (IDD). The 2005 Demographic Health Survey (DHS) has shown that about 47 % and 11% of Ethiopian children under five years of age were stunted and wasted respectively. Thirty eight percent of children under five years of age were underweight and 11% were severely underweight. Malnutrition is also very high amongst women. One in four women (27%) in Ethiopia are thin i.e. they have body mass index of less than 18.5 (DHS, 2005). Malnutrition in one or more of its various forms frequently characterizes emergency situations, both natural and man-made. (CSA, 2005). Access to food and maintenance of adequate nutritional status is a critical determinant of people's survival in the initial stages of an emergency (Edris M., 2004).

Ensuring that the food and nutritional needs of disaster-stricken populations, refugees or internally displaced people are adequately met is often the principal component of the humanitarian, logistic, management and financial response to an emergency. When the nutritional needs of a population or population subgroup

– are not adequately met, some form of malnutrition soon emerges, usually among the most vulnerable individuals. Malnutrition can be the most serious public health problem and may be a leading cause of death, whether directly or indirectly (Anderson and per-pinstrup, 1981).

Health and nutrition are indeed closely linked: disease contributes to malnutrition and malnutrition makes an individual more susceptible to disease and consequently more likely to die. Severe malnutrition especially increases the incidence, duration and severity of infectious disease. The most common types of disease suffered by young children in both stable and emergency situations include: diarrhea, acute respiratory infections, measles and malaria. All of these conditions may in turn contribute to increased malnutrition through loss of appetite, malabsorption of nutrients, loss of nutrients through diarrhea or vomiting, or through altered metabolism which increases the body's need for nutrients. Death rates among children who are severely malnourished are about six times greater than among those who are healthy and well-nourished in the same population, and twenty to fifty times greater than the rate in rich and prosperous countries. (Eksmyr R., 1970).

The short-term implications of malnutrition include weight loss and growth faltering as well as increased susceptibility to disease. Long-term chronic malnutrition, or "stunting", has intergenerational implications as well. Stunted girls who reach motherhood are more likely to give birth to low birth weight (<2.5kg) babies, who in turn are more at risk of becoming malnourished. The condition of stunted children can rapidly worsen with the onset of Complications such as diarrhea, respiratory infections and measles and lead to increased rates of death (Merrill, W, 1984).

Ethiopia is a producer of a variety of agricultural products; it is nevertheless, one of the countries in the world with the highest number of malnourished population. Studies show that the health problem of the majority of the population of Ethiopia emanate from lack of adequate and balanced diet Children, pregnant women, lactating mothers and adults are most affected by the Problem. In addition to lack of adequate and balanced diet, the increasing growing number of people who are attacked by diseases that occur due protein-energy malnutrition and to lack of disease protecting foods especially low intake of vitamin A, iron and iodine, is an indication of the problem related to malnutrition. The 29% malnutrition prevalence among lactating mothers, the 5-15% prevalence of vitamin deficiency diseases (night blindness) among the pregnant women, the 30% prevalence of iodine among the general population and the 58% child death rate due to malnutrition. These statistics show the seriousness of the problem.

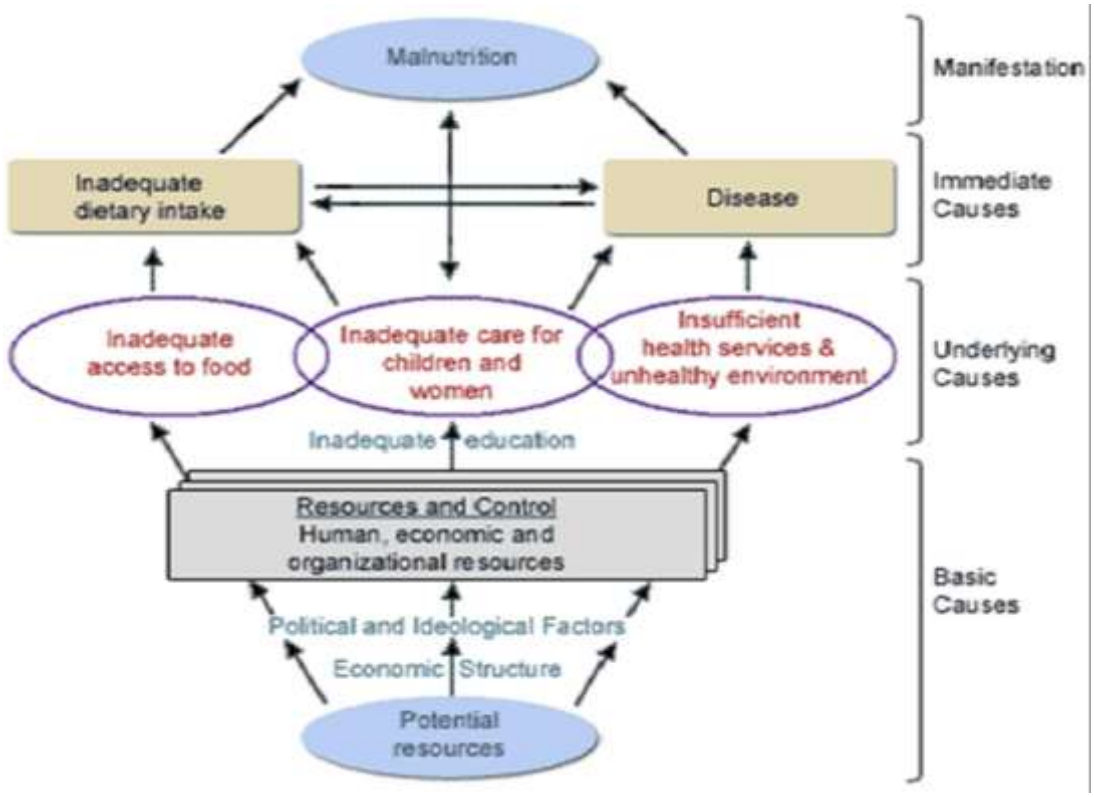

Figure 1: Cause of malnutrition. Source: Adapted from UNICEF.

The magnitude of malnutrition shows that:

- About 47% of children under the age of three are underweight and 46% are stunted.
- 74% of children between the ages of 6-35 months suffer from anemia.
- About 36% of women 15-49 years are undernourished.
- Prevalence of anemia among women is about 52%.

Malnutrition is predominantly seen among the rural population since the food of the population is based on crops. The knowledge of the rural population about the value and preparation of disease preventing and body building foods such as vegetables and fruits, and animal products is limited. The cultural practice the rural population has towards regularly feeding the family with these foods is not yet developed. The same is about giving supplementary food to children as an addition to breast milk. The main contributor of the above problems of malnutrition is not only low purchasing power of families and inadequate supply of food but the belief and the concept of the society about nutrition is low. Hence, social and traditional pressures have a lot of contribution to the problem of malnutrition in Ethiopia. (According to the 2000 Central Statistical) Authority study, more than 50% of Ethiopian children have not grown to the level they are expected to grow, 47% of them have weight below the standard weight set for their age and 11% are extremely malnourished (marasmic). This study also shows that the number of malnourished children under the age of 5 years is increasing Surplus food producing areas are also among the areas where the problem of malnutrition is predominantly seen(CSA 2000).

This family centered nutrition package is therefore, prepared to develop the knowledge and skills of the society about nutrition and to build its capacity for identifying and taking appropriate actions to eradicate malnutrition and prevent its resurgence. The health extension workers will be the implementers of the package. With regard to the implementation of the package, each region can improve the package to promote balanced food preparation methods based on the types of agricultural products and the nutritional food preparation methods and practices(CSA, 2000).

2.5.5. Consequences of malnutrition and major determinants for communities

The enormous consequences of malnutrition are often not appreciated because they may be hidden. Often there are no obvious signs, and the victims themselves are silent and not aware of the problem. Yet, data available CSA,2000 now indicates that, in Ethiopia, malnutrition starts very early in life for large numbers of children who become progressively more malnourished during the first two years of life by 24 months, considerable damage to the developing child has been done and satisfactory recovery becomes less likely,(DHS, 2005).

Well-nourished women are likely to be fit and healthy and able to look after their family well. The outcomes of pregnancy and lactation are improved when the woman is healthy herself. As you read in an earlier study session in this Module, the nutritional needs of a pregnant and a lactating woman are greater than at other times in her life. During pregnancy, the food the mother eats also helps to meet the nutritional needs of the unborn baby. During lactation, the food the mother eats helps in production of breast milk. The malnutrition has many causes, these are some of the causes and its effects are also multidimensional in nature. (DHS, 2005).

2.5.5.1. Increased risk of disease and death

Malnutrition, sub-optimal infant feeding practices, and vitamin A deficiency, significantly lower the resistance to infections and dramatically increase the risk of illnesses and death. Millions of children die of severe acute malnutrition each year.

2.5.5.2. Low productivity of the malnourished individuals

Stunting has a serious impact on the productivity of individuals. Stunted children grow up to become less productive adults. Studies show that labour productivity declines as severity of stunting increases. Iodine deficiency also significantly reduces the productivity of an individual.

2.5.5.3. Poor school performance and attendance

Proper nutrition is essential for mental and physical development and for school performance. Malnutrition reduces children's learning ability, school performance and attendance. Iodine deficiency lowers the ability of children to think and become creative and productive adults. Iodine is necessary for the normal development of the brain of the fetus during pregnancy.

2.5.5.4. Poverty perpetuation (a vicious circle)

Malnutrition affects children, women, and communities and will prevent them from reaching their full mental and physical capacity. As we have discussed earlier, a malnourished child will grow to a malnourished adult. The productivity of the adult will be decreased and poverty will continue (DHS2005).

2.5.5.5. Intergenerational cycle of malnutrition

Malnutrition has an intergenerational cycle. A malnourished mother will give birth to a low birth weight baby; the low birth weight baby will grow as a malnourished child, then to a malnourished teenager, then to a malnourished pregnant woman, and so the cycle continues.

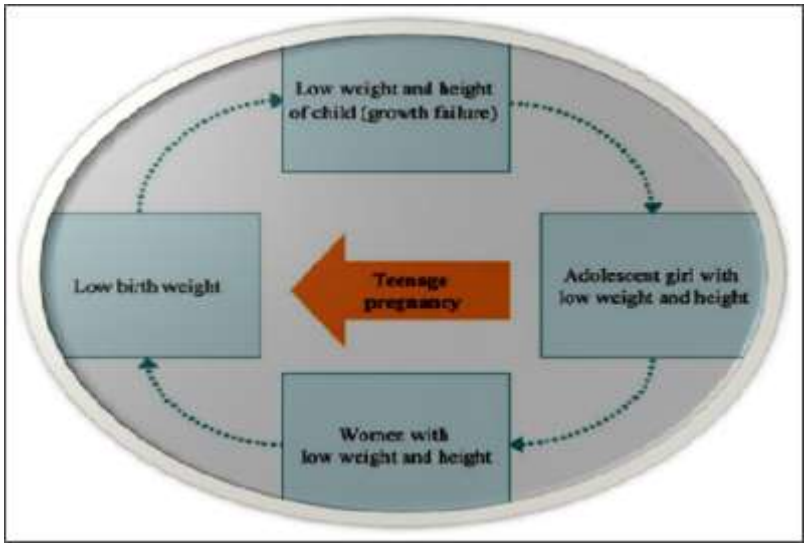

Figure 2: Intergenerational cycle of malnutrition.

2.6. Cause of malnutrition

The causes of malnutrition can be very complex. Malnutrition is influenced by many factors acting at multiple levels. These factors often act in a continuous cycle and include dietary intake issues, diseases, food insecurity, and inadequate maternal and child health care and sanitation services. Illiteracy and poverty may also influence the food intake of people in your community and become causes of malnutrition.

2.6.1. Immediate causes of malnutrition

The immediate causes associated with malnutrition include poor diet and disease.

Poor diet: If a child doesn't get an adequate diet they will become malnourished. The poor diet might be due to not enough food, or a lack of variety of foods in meals; low concentrations of energy and nutrients in meals; infrequent meals; insufficient breast milk; and early weaning. **Disease**: Diseases, especially infectious diseases, cause under nutrition because a sick child may not eat or absorb enough nutrients, or may lose nutrients from the body due to vomiting or diarrhea, or have increased nutrient needs which are not met. The diseases most likely to cause under nutrition are: measles; diarrhea; AIDS; respiratory infections; malaria; and intestinal worms. (DHS, 2000).

2.6.2. Underlying causes of malnutrition

Poor diet and disease are the immediate causes of malnutrition for children but it is always important to try to find out why that child has a poor diet or why they have developed the disease. The underlying causes differ within different communities and from family to family but it is useful to group them into: family food shortages; inadequate care of children and women; unhealthy environment and poor health services; and too many children in a family to feed. For each underlying cause you identify, there is probably another, 'deeper' cause. For example, a child may have a poor diet because the family has little food. But why is the family short of food? Perhaps they have too little land or a low income. But why have they too little land? Keep probing and asking 'But why?' Eventually you should be able to determine the basic causes. Let us now further examine the underlying causes under three of the main groups given above. (DHS, 2000).

Family food shortages: Many families do not have enough food to feed everyone properly throughout the year. But why are these families short of food? The possible reasons for family food shortages may be that there is a large number of families in the locality, leading to over-cultivation of their lands. Another might be the effects of low income or poor budgeting. Some people may spend so much on 'non-essential' things such as cigarettes and beer, so there is not enough money left for the family's food needs. There may also be poor distribution of food among families.

2.6. 3. Basic causes of malnutrition

The availability and control of resources (human, economic and organizational) at the various levels of society are a result of four major factors. (DHS, 2000). These are political factors, cultural factors, environmental factors, and social factors. Any one or a combination of these can be a basic cause of malnutrition.

2.6.3.1. Political factors

Certain political factors, such as policy decisions and economic situations caused by inflation or war, can cause under nutrition. A good example was the high level of malnutrition amongst many Ethiopian citizens during the Ethio-Eritrean war.

2.6.3.2. Cultural factors

There may be many and it can be hard to get people to realise that these beliefs have a negative impact on their or their children's bodies. For example, abrupt weaning due to pregnancy, the belief that food should not be given to a child who is suffering from measles or

diarrhoea, and sharing food from the same bowl between different children, can result in the child getting less than their body requirements, are examples of some of the cultural factors that may affect nutrition(DHS 2005).

2.6.3.3. Environmental or natural disasters
Drought, floods and earthquakes are other basic causes that can lead to malnutrition. The 1977 drought of Ethiopia is a good example of a natural disaster with terrible consequences.

2.6.3.4. Social factors
Poverty is the reason that some families cannot produce or buy more food. Men often leave home to search for work, leaving women to bring up children alone. Poverty can lead to family quarrels and child abuse. Often women have less access to money, land and other resources, and less control over family decisions than men. You have now studied the causes of under nutrition and thought about how these might be found in your own community.

3. MATERIALS AND METHOD

3.1. Description of the study area
The study was conducted in Horo District which is found in Horo Guduru Wollega Zone, Oromia Regional state, south western Ethiopia. It is located 315km from Addis Ababa. The district has three high school, two preparatory school four health centers and different private clinics which give service to the population of the district and the surrounding. The climatic condition of the district is woina-dega with altitude 1450-2084 meter above sea level. The district covers an area of 388,428.5Square Km. Based on figures from the Central Statistical Agency in 2005, this district has an estimated total population of 100,286 of which 65% rural and 35% urban whom 57,872 were males and 42,414 were females. The district has 20 kebeles from rural and three kebeles from urban.

3.2. Study design and period
In conducting the study ,both qualitative and quantitative methods of research design was chosen for the study the qualitative methods used because the complex nature of the phenomenon under the study, qualitative approach can better enable the researcher to bring participants voice to the study and thus again deeper insights in to their experience of the nutritional status and determinants of malnutrition of children under five year of age, to address the trustworthiness of the study, the researcher was critically inform the target group the purpose of the study and tell them to be honest while they give information regarding to the study. It helps the research to acquire contextualized and holistic understandings interpretations of phenomena that occur in particular types of contexts.

On the other hand, the quantitative methods was used, because probability sampling provides quantitative data more representative data of a larger population than non probability sample on nutritional status and determinants of malnutrition of children and it enables to generalization the finding. Therefore A cross sectional survey was conducted in Horo District to assess nutritional status and measurements of weight and height to determine the nutritional status of children aged less than five years of age is carried out in Horo Districts of Horo Guduru Wollega Zone.

Sampling was took into account all children in Horo Districts, of nutritional status and determinants of malnutrition in children under five years of age methods among children under five years of age from January 20—30,2018.

3.3. Population
3.3.1. Source population: All children aged under five years and living in Horo District was included in the study.

3.3.2. Study population: All under five children randomly selected in the from the study area.

Study unit: Were Children at house hold.

3.4. Study Variables
3.4.1. Independent variable
Four categories of factors were assessed as independent variables;

- Socio-economic and demographic variables; type of family, family size, income, maternal/paternal education and occupation of mother.
- Child characteristics; Age, Sex, birth order, birth size/wt and morbidly status.
- Child caring practices; feeding, health care seeking.
- Maternal Caring and characteristics; age, height, nutrition awareness, number of children ever born, pre-pregnancy weight, health status during pregnancy and use of extra food during pregnancy or lactation.

3.4.2. Indicators (Dependent variable)
Undernutrition (stunting, wasting and underweight).

Operational Definitions
Acute malnutrition (Wasting): A nutritional deficit state of recent onset related to sudden food deprivation or mal-absorption or poor utilization of nutrients which results in rapid weight loss. It refers to low weight-for-height < -2 SD of the median value of the national center for health statistics (NCHS/WHO) international weight – for- height reference. Sever wasting is defined <-3 SD.

Chronic malnutrition (stunting): Reflects long-term cumulative effects of inadequate nutrition and health. Stunting is defined as low height-for-age at < -2 SD of median value of the NCHS/WHO international growth reference. Sever stunting is defined as <-3 SD.
Underweight: an anthropometrics index of weight-for – age represents body mass relative to age. Weight for age

is influenced by height and weight, making interpretation of this indicator difficult. Underweight refers to a deficit and is defined as low weight for age at <-2 SD of the median value of the NCHS/WHO international reference.

3.5. Sample Size and Sampling Technique

A multi-stage Systematic sampling was implemented First, the study area was stratified in to urban and rural kebeles and then a total of seven kebeles was randomly select by using lottery method; one from urban and six from the rural kebeles. A systematic sampling method was applied to select study participants.

Sample Size

Applying two proportion sample size of determination of malnutrition of children under five year of age and taking the national prevalence of underweight for rural area 40 % and 23% for the urban area (DHS 2005) and a 95% Confidence interval, the sample size was calculated as follows:

$$\frac{(Z1 - \infty/2\ 2p(1-p) + z1 - ß\ p1(1-p1) + p2(1-p2))^2}{(P2-P1)^2}$$

Where P= (P1+P2)/2, P1=0.40, P2=0.23 Power of at least 80%, i.e. (1-B) =0.80, Z1-B = 0.84
(1.96 2 (0.32) (0.68) + 0.84 (0.40) (0.60) + (0.23) (0.77))
2 (0.23-0.40)2 n = n1+n2= 235 total samples

Considering design effect of 2=235*2 = 470 and allowance for possible non-response rate of 5% makes the final sample size; 470+23= 493 HHs.

Using proportional allocation to the rural and urban based on population; 321(65%) samples From the rural kebeles and 172 (35%) samples from the urban kebeles was selected.

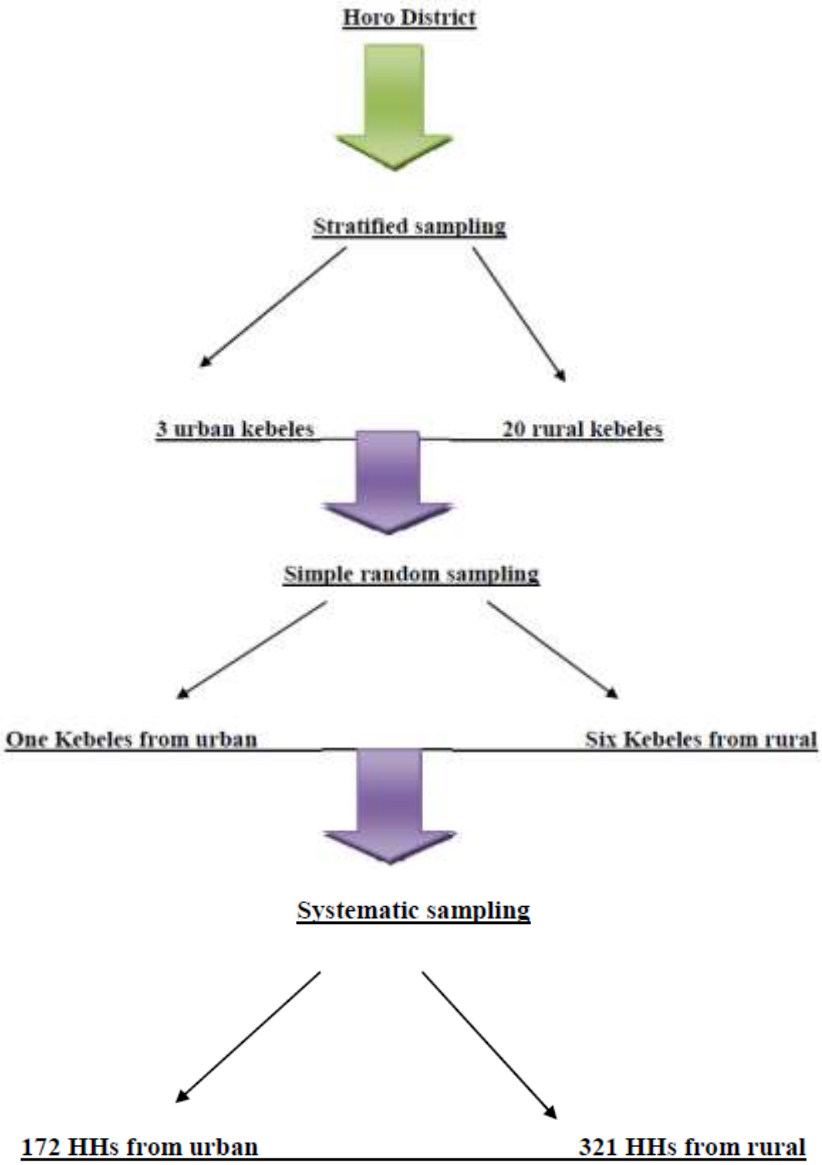

Fig. 3: Schematic presentation of sampling frame not the interval must be listed.

3.6. Data Collection Technique

Data collection was done by using well-structured questionnaire and interviewed, observation by well-trained data collectors with group member's critical supervision and giving help if any doubt. This was done after giving clear information about the purpose of the study and getting permission from the respondents. The data collection was start by lottery method selection of first house. The data was collected until it fulfills the sample size.

The children under five years in the house hold of that kebeles was included in the study during data collection time but children who come from other area (kebele) was not be included in the study. The questionnaire was translated to Afaan Oromo before going to data collection.

Quality Control

Pretest: the questionnaire was tested on non-participant and necessary correction was taken.

Training and supervision: I was give one day training for data collectors about the overall objective of the study, instructions and interviewing techniques, how to interview respondents and fill questionnaires, and also about ethical issues. The training was supported by role play.

Tool (instrument): questionnaire, pencil, and pen, time for Data Collectors & Data Analysis (SPSS, 16. version, stat transfer, and epi info software with computer). Anthropometric measurements in addition to these the formal observation also used as an instrument.

3.7. Data Analysis

The data was obtained from respondents via questionnaire, interview and from practices through observations was discussed, interpreted, summarized and analyzed descriptive. Interview was conducted with mothers of the children to fill the questionnaire and where impossible to get them or there was refusal next HH was considered for the study. In households with more than one children of age under five years, one child was selected randomly. Therefore all the data was checked and edited (at field & at office), verification to reduce error & cleaning, categorizing and analysis by using SPSS16.0 version, stat transfer, and epi info soft ware. Finally present the findings using tables, and statement forms

3.8. Ethical Consideration

Prior to data collection ethical clearance and permission was obtained from Wollega University Ethical Review Committee and was sending to Horo Gudrun Wollega Zone, Horo District administration, then would obtain permission for data collection. We was try to clearly define the purpose of the study to the respondents and the confidentiality maintain through the name of respondents don't write on the questionnaires.

4. RESULTS AND DISCUSSION

4.1 Demographic and socio-economic conditions

From the total of 493 planned study subjects, complete response was obtained 97.9. As Indicated in Table below:

Table 1: Demographic and Socio-Economic characteristics of study subjects by Residence, Horo district February 2018.

Variable	Residence			
	Rural (%)	**Urban (%)**	**Total**	**P-value**
Head of HH				
Male	96.5%	90%	458(94.2%)	1
Female	3.5%	10%	28 (5.8%)	0.005*
Marital status				
Married	86.5%	85.1%	430(88.5%)	1
Divorced	8.8 %	4.1 %	31(6.4%)	0.114
Widowed	4.7 %	1.3 %	21(4.3%)	0.713
Single			4(0.8%)	
Total Family size in HHs				
< 5	16.8%	71.8%	175(36%)	0.997
>5	83.2%	28.2%	311 (64%)	0.993
<5 years Children in House hold				
<5	75.3%	81.8%	377(77.6%)	1
>5	24.7%	18.2%	109(22.4%)	0.105
The highest grade you completed:				
Technical/vocational	43%	17%	165(34%)	1
Certificate	26.9%	30.6%	137(28%)	0.137
Diploma	20.6%	32%	120(24.7%)	0.000***
Degree	9.5%	20%	64 (13.4%)	0.332
Attending informal Education:				
Yes	62.4%	77%	327(67.3%)	0.165
NO	37.6%	22.9%	159(32.7 %)	

*Occupation of the mother:				
House wife only	31 %	25.9%	142(29%)	
Farmer	28.8%	7.1%	103(21.2%)	0.001**
Merchant/trade	11.7%	28.2%	30(17.5%)	0.000***
Private employee	5.7%	7.1%	31(6%)	0.340
Government employee	16%	17.6%	81(16.7%)	0.357
Daily labour	6.6%	14.1%	45(9.3%)	0.008**
Religion				
Orthodox	71.8%	63.9%	324(66.7%)	
Muslim	10%	4.4%	31(6.4%)	0.065
Protestant	17.6%	22.2%	100(20.6%)	0.164
Catholic	0.6%	9.5%	3(2%)	1.000
Monthly income in the HHs				
>500	66.4%	74%	337(69.3%)	0.441
<500	33.5%	25.3%	149(30.7%)	0.05*

From this analysis Male headed of HHs was 94.2 percent (90% urban, 96.5% rural), female headed HHs was 5.8 percent (urban 10 % rural 3.5 %) and 88.5 % of respondent were married, 6.4% were divorced and 4.3% was widowed.

Total family size was 54.1. % of the HHs has more than five family sizes. About 36. % of the HHs had under five year children and 9.9 % of the HHs had greater under five year children. There was no significant variation of these demographic conditions by residence.

Children less than five years live in the HHs was 77.6 % (75.3% rural, 81.8% urban).and Occupations of the heads of the households were farming (21.2%), daily laborer (9.3%), government employee (16.7%), house wife only 29.2%, private organization employee 6.2% and merchants/trade 17.5%.

Their religion was; 66.7% Orthodox Christian, 20.3% Protestants, 20.6 % Muslim 0.2 % catholic, other 6.2 % and their ethnicity 95.3% Oromo,(91.8% rural, 97.2% urban).

About 30.7% of the HHs earns monthly income of less than 500 birr (33.5 % in rural and 25.3 % in urban). About 69.3% of the HHs earns monthly income of greater than 500 birr (74% in urban and 66.4% rural area) respectively.

There is a significant variation by residence that urban resident HHs was 2.5 times more likely to get above 500 birr in a month than rural residents.

Regarding educational status 6 % of the mothers (2.9 % in urban and 7.6 % in rural) did not attend formal education but Secondary and above level education was attended by 92.4 % and 97% of mothers in urban and rural area respectively.

Lack of formal education of mothers in rural area is 2 times higher than those from urban area (OR=0.16, 95% CI: 3.2 – 5.2) However, there is no variation in maternal education level by residence.

4.2. Child characteristics

Table 2: Child characteristics and Caring practices by Residence, Horo district.

variable	Residence,			
	Rural (%)	Urban (%)	Total No (%)	P-value
Child sex				
Male	54.1%	48.8%	254(52.3%)	
Female	45.9%	51.2%	232(47.7%)	0.266
Birth order				
1year	31%	21.2%	134(27.6%)	
2year	42.7%	32.4%	190(39.1%)	0.681
3year	25.6%	46.5%	160(32.9%)	0.000***
Place of delivery				
home	60%	35.3%	250(51.4%)	
Healthy institution	39.9%	64.7%	236(48.6%)	0.017*

From the total children, 47.7% were females (45.9%rural, 51.2% urban). Their birth order was; first birth for 27.6%, second to fourth birth 72. %(68.9% rural 78.9% urban) and above forth birth order for 0.4% of the children with no significant variation by residence.

Place of delivery was at home for 51.4. % of the children (rural 60.1%, urban 35.3%) Home delivery in rural resident mothers was 2 times higher than in urban mothers (OR=8.6, 95%CI: 5.6-13.0).

About nutritional status of children 15.4% had malnourished problem (16% rural and 14% urban) and 25.9% don't know/were told the problem and there is no significant variation by residence.

Birth weight was very small for 19.3% of the children (rural 26.9%, urban 5.3%) and rural children were five times more likely to become very small birth size (OR=2.0, 95%CI: 1.1- 3.5) than urban children.

The gestational age at birth was 25.7 %(26.6%rural, 24.1%urban) greater than nine month respectively. So there is no significant variation in residence.

4.3. Child Caring practice

Child caring practice by Residence, in Horo district.

Variable	Residence,			
	Rural (%)	Urban (%)	Total No (%)	P-value
For how long do you think a child exclusive breast fed?				
in six month to	87.1%	87.3%	427(87.9%)	
in one year	4.1%	1.8%	16(3.3)	0.199
other specify	7.6%	11.2%	43(8.8%)	0.216
Who Taking care of baby feeding?				
mother	99.1%	98.2%	480(98.8%)	0.999
sister	0.9%	1.8%	3(0.6%)	0.999
grandmother			3(0.6%)	
you give the child pre-lactation food/fluid				
Yes	22.5%	7.1%	83(17.1%)	
No	77.5%	92.9%	403(82.9%)	0.001**
How long after birth did you out the child to breast feed.				
Immediately	69.9%	81%	360(74.1%)	
1hours	21%	14%	91(18.7%)	0.031*
2days	8.9%	4.1%	35(7.2%)	0.458
Was Your child weighted at birth				
yes	18.4%	74.7%	185(38.1%)	0.000***
no	81.6%	25.3%	308(61.9%)	.1

Breast Feeding; 87.9 % of children were exclusively breast fed for six month and 3.3% of children exclusively breast fed to one year (4%rural and 1.8% urban) and 8.8% are others Specified. Majority who take care of baby feeding is mother 98.8% (in rural 99.1%, urban 98.2%) respectively.

The difference was seen particularly in urban area where the disease seen in 25% (42.4% rural, 16.1% urban) of the children aged more than 2 years and none among children aged 2 and less years. Children of age two and less year in rural were affected 2.63 times higher than children of the same year in urban area. There was no statistical significant variation of these childhood illnesses by residence.

Table 3: Maternal characteristics by Residence, Horo district.

Variable	Residence,			
	Rural (%)	Urban (%)	Total No (%)	P-value
How many year difference b/n the last two of your children?				
less than 24month	57%	25.3%	223(45.9%)	1
within 24 to 48 month	43%	62.9%	243(50%)	0.000***
other specify	3%	11.8%	20(4.1%)	0.998
Total number of Children ever born?				
2	13.3%	8.2%	56(11.5%)	1
4	54.7%	64.7%	283(58.2%)	0.052
6	15%	1.8%	44(8.4%)	0.000***
3	18%	25.3%	104(21.5%)	0.997
During lactation/pregnancy Consume extra food,				
yes	67.1%	88.2%	362(74.5%)	1
no	32.9%	11.8%	124(25.5%)	0.000***
Healthy status during pregnancy				
good	72.2%	90%	381(78.4%)	1
not good/sick	27.8%	10%	105(21.6%)	0.000**
other				

Did you breast fed the child?				
yes	77.2%	87.1%	392(80.7%)	1
no	22.8%	12.9%	94(19.3%)	0.010
what do you think your child physically looks				
thin	24%	23.3%	113(23.3%)	
heavy	22.2%	19.3%	94(19.3%)	0.0319*
small	16.5%	15%	73(15%)	0.0655
tall	10.1%	11.9%	58(11.9%)	0.096
normal	26.9%	30.5%	148(30.5%)	0.078

As indicated in table 3, The total number of children ever born in the HHs 2-4 year was 95% (rural 86% and urban 98.2%) to a mother was gave birth of five and above children were 1.14 times higher than in rural with no significant variation by residence.

Majority of the healthy status during pregnancy of mothers (78.4%) good in healthy status(rural 72.2% and urban 90%) mothers in urban area who was good in healthy status were 1.2 times higher than rural mothers [OR=1.2, 95%CI: 1.8-8.0].

About 21% (10% in urban and 27.8% in rural, P-value >0.05) of the mothers not good during pregnancy to give birth of the child.

No extra food was taken from the usual time during pregnancy and lactation for 25.5% of the mothers (rural; 67.1% and urban; 11.8%) and rural mothers who did not received it were 5.7 times higher than urban mothers who did not received extra food (OR=5.7, 95%CI: 2-3.5). the year difference b/n the last two of the children is 45.9% less than 24month (in rural 57%, urban 25.3%) respectively.

4.4. Nutritional status of the children under five year

The nutritional status of malnutrition of children in urban and rural settings Overall nutritional status of stunting, wasting and underweight were 31.2% (urban; 35.3%, rural; 29.2%), 16.6% (urban; 13.5%, rural; 16. %) and 21.4% (urban; 19.4%, rural; 21.4. %) respectively. Prevalence of severe stunting; wasting and underweight were 15.4%, 6.99% and 8.23% respectively. There was no significant difference of the prevalence of malnutrition by residence. However, there was some variation of occurrence of malnutrition by child sex and age group.

Nutritional status of Child Malnutrition by Residence, in, Horo district, H/G/W/ZONE

Variable	Residence			
	Urban No (%)	Rural No (%)	Total No (%)	OR (95%CI)
Stunting	60 (35.3%)	92 (29.2%)	152(31.3. %)	1.081(0.694-1.684)
Severe Stunting	29 (17%)	46 (14.6%)	75 (15.4%)	1.151(0.683-1.940)
Wasting	23 (13.5%)	58 (16%)	81(16.6%)	1.087(.716-1.649)
Severe wasting	10 (5%)	24 (7.59%)	34(6.99%)	0.848(0.507-1.417)
Underweight	33 (19.4%)	71 (22.4%)	104 (21.4%)	1.368(0.903-2.072)
Severe underweight	15 (8.8%)	25 (7.9%)	40(8.23%	0.232(0.113-0.476)
Low MUAC(<12.5 cm)	21 (12.35%)	34 (10.7%)	55(11.3%)	1.2 (0.7-2.0)
Low MUAC(<11 cm)	8 (4.7%)	13 (4.8%)	21(4.3%)	0.574(0.349-0.945)

From the table above rural area of children were 2.4 times more severely stunted than urban (OR=0.8, 95%CI: 0.507-1.4) and rural area of children were 0.6 more stunted urban (OR=2.1, 95%CI:(0.694-1.684) Prevalence of severe stunting significantly increases in children aged above two years than those below it. Children with age 6 - 11 months were relatively protected from stunting in both rural and urban areas But, severe wasting increases in under two year aged children than those above it, however the differences was not statistically significant.

Those children who lived in rural area of the study area are more stunted than those living in urban by a factor of 1.081 (CI: 0.694-1.684) or children who were living in rural area of the study area have greater odds of stunting as compared to living in urban(AOR1.081:CI0.694-1.684).

Table 4: The nutritional status of Severe Stunting and Wasting in Child age category, Horo district.

Age category	Severe Stunting		Severe Wasting	
	No (%)	OR (95%CI)	No (%)	OR (95%CI)
6 - 11months	13 (15)	0.014 (0.002-.099)	8 (22.7)	0.000***
12 - 23 months	30 (34)	0.691 (.062-7.726)	15 (28)	1.000
24 - 35 months	15 (21)	0.016(.002-.124)	5 (25)	0.000 (0.8-10.5)
36 - 59 months	17 (30)	1.0	6 (24.2)	1.0

Significant at p<0.05

Being severe underweight has significant association with being stunted and wasted; severely underweight children were 1.87times more likely stunted (OR=1.081(0.694-1.684) and 0.87 times more likely wasted (OR=0.232(0.113-0.476)) MUAC measurement also indicated that 11.3% of the children were malnourished (<12.5 cm) and 4.3% of the children were severely malnourished, which is comparable with wasting Conditions.

4.5. The Determinants of Child Malnutrition

Malnutrition of children among under five were investigated by some selected variables related to demographic, socio-economic, child, and maternal.

Results from Bivariate and Multiple Logistic Regression analysis of selected correlates of Wasting, Horo district,

Variable	Wasting	Crude OR	AOR
	No (%)	(95% CI)	(95% CI)
Residence			
Urban	26 (68.2)	1.0	1.0
Rural	55 (75.3)	1.087(.716-1.649)	2.732(.938- 7.960)
Child sex			
Male	34 (52.2)	1.0	1.0
Female	47 (47.8)	18.278(9.507-35.140)	-
Child age			
Less than (=)24month	38 (17.9)	1.0	1.0
>24 month	43 (17.6)	1.10	-
Matern formal education			
Yes	51 (94)	1.0	1.0
No	30 (6)	4.452 (2.304-8.603)*	2.98(1.436-5.969)
Monthly HH income			
<= 500 birr	47 (86)	1.0	1.0
> 500 birr	34 (14)	1.118(.679-1.841)*	1.878 (0.729-4.834)
Place of delivery			
Home	53 (70.6)	1.0	1.0
Health facility	28 (29.4)	0.200(0.126-0.318)**	5.246(1.095-25.141)

*Significant at p<0.05, **Significant at p<0.01, ***p<0.001 level of significance, AOR=adjusted odds ratio, COR=crude odds ratio.

However, in multiple logistic analysis Maternal lack of education marginally associated with wasting (AOR=2.928, 95%CI:(1.436-5.969).

Stunting in children with very small family size were 1.8 times higher (43% prevalence) (Adjusted OR=1.8, 9%CI: 1.1-3.0) than those children with average and large family size (29.8% prevalence), 1.9 times higher (OR=1.9, 9%CI: 1.3-3.0) in children of maternal lack of education than in those children of maternal attended formal education and 1.8 times higher (OR=1.8, 9%CI: 1.22.8) in HHs lacking income than those HHs having income.

Results from Bivariate and Multiple Logistic Regression analysis of selected Correlates of Stunting, Horo district.

variable	Stunting	Crude OR	AOR
	No (%)	(95% CI)	(95% CI)
Residence			
Urban	62 (36.4%)	1.081 (.694-1.684)	5.292(0.8-2.0)
Rural	90 (28.5%)	1.0	1.0
Child sex			
Male	86 (33.8%)	1.0	1.0
Female	66 (28.44%)	3.915 (2.412-6.355)	14.625
Child age category			
Less than (=)24 month	72 (32.2)	1.0	1.0
>24 month	80 (32.9)	0.691 (.0.062-.7.726)	0.009 (0.8-1.8)
Marital Status			
Divorced	21 (4.3 %.)	0.436 (0.175-1.084)	3.884E6
Married	131 (26.95%)	1.0	1.0
Maternal formal education			
Yes	92 (28%)	1.0	1.0
No	60 (37.7)	1.479 (0.863-2.533) **	.050 (1.0-2.5) *

Family size			
<5	64 (36.5%)	0.219 (0.106-0.456) *	7.466E5(1.3-3.1)*
>5	88 (28.2)	1.0	1.0

*Significant at p<0.05, **Significant at p<0.01, ***p<0.001 level of significance, AOR=adjusted odds ratio, COR=crude odds ratio.

Underweight showed significantly high association (P-value<0.01) with children of mothers who did not take extra food during pregnancy and lactation, HHs monthly income less than 500 birr and lack of window for the houses.

Also, maternal BMI is being less than 18.5, paternal education being primary level, maternal lack of ANC and marital status being.

Widowed, unavailability of latrine and per-capita water use being less than 1 liter associated with underweight. Prevalence of underweight in these variables ranges from 21-25.2%.

Some variables including birth order, maternal age at childbirth, and length of exclusive breastfeeding, duration of breast feeding and family size were not found significantly associated with any of these nutritional outcomes.

Results from Bivariate and Multiple Logistic Regression analysis of selected Correlates of Underweight, Horo district

Variable	**Underweight**	**Crude OR**	**AOR**
	No (%)	**(95% CI)**	**(95% CI)**
Residence			
Urban	30 (17.6)	1.0	1.0
Rural	74 (23.4)	1.368 (.903-2.072)	2.787(1.627-4.772)
Child sex			
Male	54 (21.2)	1.0	1.0
Female	50 (21.5)	1.717 (1.138-2.592)	15.282(3.445-67.80)
Child age category			
Less than (=) 24. month	46 (20.6)	0.353 (0.190-0.659)	0.151 (0.067-0.342)
Above 24. month years	58 (23.8)	1.0	1.0
Marital Status			
- Widowed	11 (35.5)	0.266 (0.127-.557)	.042(.005-.377)
Married	93 (21.6)	1.0	1.0
Monthly HH income			
<= 500 birr	43 (13)	0.611 (0.307-1.213)	1.947 (0.847-4.474)
> 500 birr	61 (40)	1.064(0.677-1.672)	1.760(.791-3.914)
		1.0	1.0
Maternal BMI	32 (13.7)	1.8 (1.1-2.9) *	1.7 (0.8-3.7)
- <18.5	72 (31)	1.0	1.0
- >18.5			

*****Significant at p<0.05, ******Significant at p<0.01, *******p<0.001 level of significance, AOR=adjusted odds ratio, COR=crude odds ratio.

4.6. Determinants of Child Malnutrition by Urban-Rural residence

Analysis of those variables found significant factors in overall analysis of the determinants of malnutrition of children under five showed variation for urban and rural settings; some variables become insignificant factor and other variables strength of association with the nutritional outcomes varies by residence.

In rural area, bivariate analysis showed that low HH income, maternal lack of education, maternal educational level being primary, maternal lack of ANC and fever in children were set up association with wasting.

Place of delivery, of children, which are found to be risk Factors for child wasting in overall analysis, were not kept significant factor in rural area.

In multiple logistic analysis fever in children (AOR = 3.0, 95%CI: 1.2-7.5) and maternal lack of education (AOR = 2.1, 95%CI: 1.1-5.0) were main risk factors of wasting in rural area.

In urban area, wasting also associated only with presence of fever in children in both bivariate and multiple logistic analysis. Children having fever wasted 3.5 times higher (AOR = 3.5, 95%CI: 1.3-11.6) than those who did not have it. Also place of deliver being at home is significantly associated with wasting in urban area (OR= 2.8, 95% CI: 1.2-6.7).

Fever is an important significant factor of wasting in both urban and rural areas while ARI in children were not kept significant factor for wasting in both rural and urban area probably due to reduced sample size.

Analysis of Selected Determinant factors of Wasting by Residence, Horo District, May, 2013.

Variable	Urban		Rural	
	No (%)	Adjusted OR (95% CI)	No (%)	AOR (95% CI)
Child sex				
Male	10(12.3%)	1.0	33 (12.9)	1.0
Female	13 (16. %)	0.083 (0.016-0.424)	25 (10.7)	.
Child age category				
Less than (=)24month	12 (14.8)	1.0	23 (10.3)	0
Above 24 months	11 (13.5)	0.999	35 (14.4)	1.023
Maternal formal education				
Yes	15(8.8)	1.0	20 (6.3)	1.0
No	8 (5%)	0.550 (0.056-5.401)	38 (12)	0.996 (.408-2.430)*
Monthly HH income				
<= 500 birr	15 (16.8)	0.533 (0.207-1.371)	36 (11.3)	0.227 (0.110-0.468)
> 500 birr	8 (5)	1.0	22 (6.9)	1.0
Place of delivery				
Home	13(7.6)	1.0	42 (13.3)	1.0
Health facility	10 (6)	1.821(0.355-9.332)	16 (5)	9.255 (3.689-23.221)

*Significant at p<0.05, **Significant at p<0.01, ***p<0.001 level of significance, AOR=adjusted odds ratio, COR=crude odds ratio.

Analysis of Selected Determinant factors of Stunting by Residence, Horo district, May 2013.

Variable	Urban		Rural	
	No (%)	Adjusted OR(95% CI)	No (%)	Adjusted OR(95% CI)
Child sex				
Male	32 (19)	2.0 (1.0-4.1)	54 (17)	1.0
Female	28 (16.5)	1.0	38 (12)	0.9 (0.5-1.6)
Child age category				
Less than (=)				
2 years	36 (21.2)	1.2 (0.6-2.6)	45 (14)	0.7 (0.4-1.2)
Above 2 years	24 (14)	1.0	47 (15)	1.0
Marital Status				
- Divorced	11 (6.5)	1.0 (0.1-14.2)	8 (3)	1.0
- Married	49 (29)	1.0	84 (27)	
Maternal formal education				
- Yes	40 (23.5)	1.0	48 (15.)	1.0
- No	20 (11.76)	2.1 (0.8-5.4)	44 (14)	1.4 (0.8-2.6)

Main determinant factors of underweight in rural area are presence of ARI in children (AOR=7.0, 95% CI: 1.1-45.0) and lack of window (AOR=3.6, 95%CI: 1.2-11.0) for house.

Low maternal BMI (<18.5) is risk factor for children underweight in urban area (AOR =3.6, 95%CI: 1.2-11.0).

Analysis of Selected Determinant factors of Underweight by Residence, Horo district.

Variable	Urban		Rural	
	No (%)	Adjusted OR (95% CI)	No (%)	Adjusted OR (95% CI)
Child sex				
- Male	15 (8.8)	0.7 (0.2-2.1)	41 (13)	1.0
- Female	18 (11)	1.0	30 (10)	0.7 (0.3-1.9)
Child age category				
- Less than				
(=)2 years	21 (12.3)	1.1 (0.4-3.0)	30 (9.5)	1.0
Above 2 years	12 (7)	1.0	41 (13)	1.1 (0.4-3.2)
Marital Status				
Widowed	6 (4)	-	9 (3)	-
- Married	25 (15)	1.0	62 (20)	1.0

Monthly HH income <= 500 birr > 500 birr	 19 (11.0) 14 (8.2)	 2.5 (0.7-8.5) 1.0	 58 (18.3) 13 (4.1)	 2.1 (0.3-13.1) 1.0
Maternal intake of extra food - Yes - No	 21 (12.4) 12 (7.1)	 1.0 1.1 (0.4-3.6)	 24 (8) 47 (14.9)	 1.0 2.2 (0.8-6.5)
Maternal BMI - <18.5 - >18.5	 18 (11) 15 (9)	 3.6 (1.2-11.0) 1.0	 21 (6.5) 50 (16)	 1.0 (0.3-3.6) 1.0

5. DISCUSSION

From above analysis nutritional status and major determinants of child malnutrition was high in the district and in comparison to the DHS 2005 report of stunting, underweight and the respective sever forms; the findings of this study is higher. However, wasting (16.6%) and sever wasting condition (6.99%) of the children in the study area were higher than that of the national (10.5% wasting and 2.2% severe wasting) as well as regional (9.6% wasting and 2.4% severe form) DHS report.

There was very high prevalence of wasting in the study area alarming to increased risk of death to children. It signifies acute nutritional problem due to illness and/or recent food Shortage. High chronic malnutrition also signifies children's failure to grow; impact on both Physical and mental capacity of the affected children.

According to discussion with some community members, recently there was lack of modern agricultural application crop and affected income of the HHs to purchase food items.

Common staple food of the area is also maize and teff that cannot provide nutritious food particularly for children. Also, there is inadequate child caring practices mainly on child feeding. In this study, wasting was associated with fever in both bivariate and multivariate analysis.

This indicates that childhood illness is the main factor for acute nutritional problem. Illness affects dietary intake and utilization.

In an independent analysis of selected variables with wasting; low HH income, presence of ARI in children, place of delivery being at home and lack of maternal education were found significant risk factors.

As the proportion of these variables, except ARI, is significantly higher in the rural area, they are more important determinants of wasting in the rural area.

Variables including; low birth size, and maternal lack of education will become important factors of stunting particularly in rural area because their proportion is higher in the rural area. Underweight associated with presence of ARI in children and lack of windows for house after controlling for potential confounders. However, in the bivariate analysis many variables were significantly associated with it. Particularly low income of the HHs and mothers not receiving extra food during pregnancy and lactation were associated significantly with underweight (P value< 0.001).

Also maternal low BMI were significant factors. Many of these findings were in agreement with other studies; Income growths at the HH and National levels imply similar rates of reduction in malnutrition (Lawrence H., et.al: 2003).

Study in the country indicated that private income growth and enhanced female adult Education would reduce the prevalence of child stunting by about 5 to 10% each with the effect of the latter intervention typically a little bit larger. Together, they would eliminate between 10 and 20% of Ethiopia's child stunting using the diagnostic capability of mothers as a proxy for their nutritional knowledge (Christiansen, L., Alderman, H., 2001).

It is also indicated that a high prevalence of stunting in children of illiterate mother than children of literate mothers (Lisa C. Smith and Lawrence H.2000, Timotewos G., Jamal Haidar et al., 1999). Education enables women to provide appropriate care for children.

A study explored the relationship between women status, defined by the women's power relative to men, and children's nutrition in three developing region; Sub-Saharan Africa, South Asia and Latin America and Caribbean indicated that higher women status has positive effect on children's nutritional status. It was also noticed that women's status impacts child nutrition because women with higher status have better nutrition themselves, are better cared for, and provide higher quality of care for their children (Lisa C. Smith et.al, 2003).

In Ethiopia, three consecutive welfare monitoring surveys over the period of 1996-1998 identified household resources, parental education, food prices and maternal nutritional knowledge as key determinants of growth faltering. Community sanitation, health and communication infrastructure are also important determinants of child malnutrition ((Lawrence H., *et.al*: 2003).

Young lives research project in Ethiopia April 2004 - December 2005 indicated that there is need for greater attention on intra-household access to resources and power in consideration of livelihoods and food security interventions. The result found out that while access to independent income for women was generally positive, caring practices also suffered due to arduous hours worked by women and a compulsion to wean children prematurely (Young Lives Research Project: Childhood Poverty in Ethiopia, Project Number:102447).

This study finding is also consistent with the study in Bangladesh which showed birth size as an important risk factor for all the three categories of malnutrition (stunting, wasting and underweight). Children of well-nourished mothers had a lower risk of being underweight Compared to children of acutely malnutrition mothers. The reason may be that thin or malnourished mother cannot provide sufficient breast milk because of their nutritional deficiency.

Acute malnutrition of mother could be an impediment for her child's growth. Maternal nutrition influences fetal growth and birth weight as there is an intergenerational link between maternal and child nutrition. Studies showed that a high proportion of low birth weight and stunted children were observed among malnourished mothers (Md. Israt Rayhan and M. Sekander Hayat Khan; 2006).

Another study in Bangladesh showed, children who were very small in size at birth had two times higher risk of being stunted than those who were larger in size at birth. Prevalence of wasting and underweight were also remarkably high among low birth weight children.(Sanghvi et al.,2001) investigated the risk factors for underweight status in children under 3 years of age in Kerala, India. Their statistical analysis showed that infant birth weight ($p = 0.01$) and maternal body mass index ($p = 0.03$) were significant risk factors for current child underweight status. Wasting and underweight status of under five children showed significant relationship with mothers BMI (Md. Israt Rayhan and M. Sekander Hayat Khan; 2006).

Mothers living in developing countries are often exhausted by the combination of pregnancy and child birth which can end in the loss of their lives. Low birth weight and/or immature and malnourished infants born to such women are vulnerable to life-threatening diseases and nutritional problems according to (UN ACC/SCN, 1990).

The external impacts of community level of access to these services are an important determinant of the probability a child is underweight and the external impact of access to water is larger for children living in rural areas.

This report also indicated that biological factor; child's age and mother's height and social economic factors; household wealth and mother's education, are important determinants of a child's nutritional status (World Bank policy Research working paper 3489, 2005).

Prevalence of chronic energy deficiency (<18.5 Kg/m2 BMI) of mothers (24.8%) in the study area was lower than the national (DHS 2005) finding which was 27.0%. However, it was Comparable with the Oromia regional finding of the DHS (24.3%).

Although evidences show that urban children generally have a better nutritional status than their rural counterparts particularly for liner growth (stunting) and underweight (Lisa C. et.al, 2005), this study could not find significant difference by urban-rural settings. It is suggested that accelerated rates of urbanization currently observed in the developing world raise new Concerns regarding increasing rate of urban malnutrition (Lisa C. et.al, 2005.).

However, significance and strength of the determinant factors varies by residence in this Study. Analysis of prevalence of severe malnutrition conditions by child age group point out that severe wasting is higher in children aged 3-5 years which indicates that the children are already in the state of being stunted as a result of cumulative effect of the risk factors On the contrary, prevalence of severe wasting is higher in children of age less than two years.

CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

Based on findings of the study it can be concluded that; acute nutritional problem is at critical stage alarming to hasten mortality of children. High prevalence of stunting in the area is also of particular concern in both rural and urban areas.

In both rural and urban setting's childhood illness which is indicated by fever and maternal lack of education in rural area are important determinants of wasting.

Also, in bivariate analysis low family income, place of delivery being at home, maternal lack of ANC becomes significant factors of wasting in rural area.

Low birth size, lack of animal, paternal lack of education and decision making on use of money being only husband were key determinants of stunting. In rural area, children birth sizes being very small and in urban area child sex are important factors of stunting.

In rural area presence of ARI (upper respiratory infection) in children and lack of widow for house were main determinants of underweight while low maternal BMI is risk factor for children being underweight in urban area.

Rural resident children are more exposed to nutritional risk factors than their urban counterparts.

6.2. RECOMMENDATIONS

Based on the finding of this research the following points are recommended:

- Awareness creation among the societies in the study area in particular for caregivers and mothers.
- Intervention initiatives should focus on improving HH food security; support income generation, nutrition education, promotion of education and status of women and agricultural diversification.
- Promotion of better child and maternal caring practices.
- Improved multi-sectorial interventions to address multifaceted causes of malnutrition.
- A balanced strategy of income growth and investment in more direct interventions are essential to accelerate reductions in malnutrition and met MDG.
- Non-governmental organizations operating locally, nationally and internationally include promotion of adequate food and nutrition for young children and families.
- The Ethiopian government should formulate, implement, monitor and evaluate a comprehensive national strategy on infant and young child feeding.
- Manufacturers and distributors of industrially processed foods intended for infants and young children also have a constructive role to play in achieving the aim of the policy.
- Parents and other caregivers are most directly responsible for feeding children, ever keen to ensure that they have accurate information to make appropriate feeding choices, parents nevertheless are limited by their immediate environment.
- Further research in child caring practices and dietary assessments are required in the study area.
- Similar research should be conducted in similar district.

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