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Disclosing the Relationship between Maternal Empowerment and Food Security Status on Stunting, Underweight and Wasting among 6-36 Month Old Children in Gurage Zone, Southern Ethiopia

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Declaration

The undersigned declared that this thesis work is my original work in partial fulfillment of the requirement for the degree of Master in Public Health. All source of materials used for this thesis work and all people and institutions who gave support during this thesis work are fully acknowledged.

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List of Acronym and Abbreviations

AOR---Adjusted Odds Ratio

BMI--Body Mass Index

COR ---Crude Odds Ratio

EDHS---Ethiopia Demographic and Health Survey

ENA-- Emergency Nutrition Assessment

FANTA ---Food and Nutrition Technical Assistance

GTP---Growth and Transformation Plan

HAZ---Height for Age

HIV --Human Immuno-deficiency Virus

HFIAS--Household Food Insecurity Access Scale

IUGR---Intrauterine Growth Restriction

LBW--Low Birth Weight

MUAC ---Mid Upper Arm Circumference

NCHS --National Center of Health Statistics

NNS--National Nutritional Strategy

PEM--Protein Energy Malnutrition

OPD---Out Patient Department

SD--Standard Deviation

STI ---Sexually Transmitted Infection

SUN--Scaling –Up-Nutrition

SNNPR --Southern, Nations, Nationalities and People‘s Region

SPSS---Statistical Package for Social Science

USAID---United Sates Agency for International Development

VIF--Variance Inflation Factor

WHO--- World Health Organization

WHZ---Weight-for-Height Z-scores

WAZ-- weight-for-Age Z-scores

Abstract

Background: Globally, malnutrition is one of the most common causes of morbidity and mortality in children under the age of five year. In our nation 51% of all causes of death in children under the age of five year were associated with malnutrition. But, little information is available on whether maternal empowerment and food insecurity are contextual underlying determinants of protein energy malnutrition among 6-36 month old children, especially in the case of gurage zone. Therefore, this study aimed to assess the relationship between household maternal empowerment and food security status on protein energy malnutrition (PEM) among 6-36 month old children

Methods: A health facility based unmatched case–control study was conducted from February 20 to April 20, 2015 among 6-36 month old children who visited to Butajira hospital and health center in Butajira town of Gurage zone. A total of 346 (116 children with undernutrition and 232 children free of undernutrition) children were included in the study. Though eligible case participants were selected consecutively, control participants were selected by systematic sampling technique. The data were collected using interviewer administered structured questionnaire with anthropometric measurement instrument. Data were entered into EPI data 3.1 computer program and analyzed using statistical package for social science version 21. Crude and adjusted odds ratios were calculated through simple and binominal multiple logistic regressions model.

Result:-A total of 115 cases and 231 controls were included in the analysis. After adjusting for the potential confounders, stunting among children was significantly associated with household maternal disempowerment[AOR 6.66 (2.32-19.14)], moderate[AOR 4.894 (1.66-14.35)] and severe food insecurity [AOR 9.465 (3.13-28.57)]. Sever food insecurity [AOR 2.880 (1.282-6.469)] and maternal disempowerment[AOR 2.658 (1.067-6.621)] was significantly associated with Underweight. However, from hypothesized variables only sever food insecurity were shown an association with wasting[AOR 2.79 (1.09-7.16)]

Conclusion: Maternal disempowerment and severe food insecurity were independently associated with wasting, stunting and underweight among 6-36 month old children who visited to Butajira Hospital and Health center of Gurage zone. Besides, living in rural residence, having low wealth status and being in age group less than or equal to 24month were found to be factor influencing the nutritional status of children.

Introduction

The World Health Organization (WHO) defines malnutrition as the cellular imbalance between supply of nutrients and energy and the body's demand for them to ensure growth, maintenance, and specific functions and it both include over nutrition and under nutrition. In the context of developing countries, under-nutrition is generally the main issue of concern, though industrialization and changes in eating habits have increased the prevalence of over-nutrition, malnutrition in this setup (developing country) refers to under nutrition unless specified(1). Protein energy malnutrition (PEM) is currently defined as combined deficiencies in Protein, Energy and Micronutrients that are needed for growth and development. PEM covers wide spectrum of pathological conditions, the extremes being nutritional marasmus, kwashiorkor and marasmic kwashiorkor (3). It occurs more frequently in infant and young children (3).

Generally, the causes of malnutrition are multiple and operating at different levels or simultaneously and classified as immediate causes (inadequate intake of nutrients and Illnesses), underlying causes (food insecurity, poor care and sanitation), and basic causes (ecological, social, political… etc (2).

For practical purposes there are two different approaches that are important for diagnosing and classifying PEM. The first one is clinical (qualitative) approaches which diagnose malnutrition by using sign and symptom and classify malnourished children as kwashiorkor, marasmus, and marasmickwash.

The second one is called subclinical/public health (quantitative) approach which uses anthropometric measurement for diagnosis and classification. This approach classify children as wasted, underweight and stunted by comparing their z-score or percent of the median or percentiles with the cut of point of WHO child growth standard ,which bases national center of health statistics as reference(NCHS) (1). Z-score is the difference between the value for an individual and the median value of the reference population for the same age or height, divided by the standard deviation of the reference population (1). The most commonly-used cut-off with z-scores is -2 standard deviations, irrespective of the indicator used (1). This means children with a z-score of weight for height or height for age or weight for age below -2 SD (standard deviation) are considered moderately or severely malnourished.

1. Statement of the problem

Globally, malnutrition is one of the most common causes of morbidity and mortality in children under the age of five years (4). Global estimation on child hood malnutrition revealed that 165 million children were stunted, 101million were under weight and 52 million were wasted in 2011. Africa and Asia account the ninety (90 %) of this statistics (5). Malnutrition is a health outcome as well as it can increase the risk of both morbidity and mortality associated with other disease (6). Worldwide, it is estimated that 45% of all child deaths directly and indirectly associated with under nutrition and hence, of 6.9 million of death occurred 3.1 million were associated with malnutrition (7).

Ethiopia is the second-most populous country in Africa that inhabits approximately 84 million people and of these; around 14% of them were children under five years of age (8). These children and their mothers were suffering disproportionately from poor health and nutrition in the country (9). In 2011, 44.4 %, 28.7 % and 9.5% of children under the age of five year were stunted, underweight and wasted respectively (10). Similarly 51 % of all causes of death in under five year children were associated with malnutrition (10). National Nutrition Programme Implementing Sector also declares that we as a government found that high malnutrition rates reported in EDHS so we shall work through enhanced strategic partnerships to prioritize the elimination of malnutrition from Ethiopia as one of the most viable strategies for achieving the Growth and Transformation Plan (GTP)and the Millennium Development Goals(4).

In Southern Nations, Nationalities and Peoples‘ Region(SNNPR) of Ethiopia 44.1% ,28.6 and 7.4% of under five children were stunted, under weight and wasted in 2011 respectively (10). As study done by Girmay in 2010 the prevalence of underweight, stunting and wasting in infant in Butajira hospital district sites estimated as 21.2%, 37.7% and 12.5%(11). Currently, unpublished report show that malnutrition is one of the top five causes of morbidity in children under the age of five year in Butajira area.

Between 2000 and 2011, the prevalence of stunting declined from 57.8 to 44.4 % and underweight declined from 42.1 to 28.7, wasting declined from 12.9 to 9.7 %, nationally (10). Hence, the prevalence of underweight and stunting is declined by 1.34 % per year and wasting is

declined by only 0.32 %. While this trend is clearly progressing in the right direction, its baseline level is high. Therefore, still it show as a public health problem of the country.

Looking at the policies on problem, the government of Ethiopia has demonstrated its policy commitment to nutrition by developing a standalone National Nutrition Strategy (NNS) and a National Nutrition Programme (NNP), along with a set of guidelines. The government has also incorporated nutrition, in particular stunting, into its GTP. The Food Security activity is included as one major component of NNS by considering it as an effective means of address many of the underlying causes of malnutrition related to food. Through referring research finding done in different part of the world, the author of National Nutrition Programme of Ethiopia acknowledged maternal empowerment as it is highly correlated and interconnected with livelihood security at household and community levels throughout life (gestation, infancy, childhood, adolescence, adulthood and old age). Later, they set enhancing women empowerment as a key intervention strategy to improve nutritional well being of people in all age group (4).

Reviewing the research finding on the determinant factors of malnutrition, the risk factors of malnutrition are multifaceted and complex, and the relative importance of each of the known risk factors of malnutrition including household food insecurity is likely to vary between settings. it has long been recognized that poor socioeconomic status, low education, sub-optimal nutrition and poor environmental and personal hygiene condition, poor nutritional status of the mother as a major risk factor of under nutrition. Some studies also explore low maternal empowerment and food insecurity as risk factor of moderate and acute malnutrition. However, there is no empirical study that simultaneously investigates the role of maternal empowerment and food insecurity on the risk of protein energy malnutrition in 6-36 month old children. This study, therefore, aimed at to examine the association between maternal empowerment and food insecurity with undernutrition in 6-36 month old children after adjusting for the other known determinant of malnutrition.

2. Justification

Having good nutrition is a human right of anybody. Healthy children are a potential resource for the development of nation and world too, but this potential resource is compromised by protein energy malnutrition. Given, the risk factors of malnutrition are likely to vary between settings, but nationally there is no sound empirical study that explores whether household maternal empowerment status is significantly associated with stunting, underweight and wasting. Besides, there were a multiple of epidemiological studies done on determinants of childhood malnutrition, but, to the best of author's knowledge, none of them simultaneously examine the role of food security and maternal empowerment status on chance of stunting, underweight and wasting.

3. Significance of the study

This study could provide us whether household maternal empowerment and food security status were contextual underlying determinants of protein energy malnutrition among 6-36 month old children, especially in the case of Gurage zone. Dissemination of the findings to local health programmer and policy maker including to those who work at area similar to study area will have very important positive impact for setting context specific nutritional intervention. In addition it will re-strengthen the already launched government strategy that directs maternal empowerment and food security activities as a key intervention component for assuring food security and child nutritional wellbeing. The study could also provide baseline information for conducting more strong analytical studies.

4. Literature review

Healthy child growth and development is a basic human right of children and it is the basis of human development. Good nutrition is the cornerstone for survival, health and development for current and succeeding generations. Well-nourished children will have good school performance, healthy adult stature during conception and inurn they give a health children at start of their life. (12).

Conversely, the impact of malnutrition is multidimensional and has a great impact on country development by causing direct losses of future productive children, poor childhood development, poor school performance and unnecessary medical cost. If we don‘t intervene at there, the grown child will enter into motherhood as malnourished and which again perpetuate malnutrition ultimately poverty (12).

5.1 Factor associated with protein energy malnutrition

The determinant factors for under nutrition were widely varied country to country with few consistent epidemiological patterns. Some of the identified risk factors are described below.

5.1.1 Protein energy malnutrition and infection

Infections and malnutrition operate in a vicious cycle to affect child health. Infections adversely affect nutritional status in young children through reductions in food intake caused by loss of appetite as well as changes in intestinal absorption, changes in metabolism, and excretion of specific nutrients (17). Malnutrition can increase a child‘s susceptibility to infection by negatively affecting the barrier protection afforded by the skin and mucous membranes and by inducing alterations that reduce the child‘s immunity (18).

5.1.1 Maternal empowerment and protein energy malnutrition

Maternal empowerment is a difficult concept to define, conceptualize and to measure also. There is no agreed definition up on maternal empowerment but there are plenty of a few overlapping terms like: options, choice, control, and power included in the definition of the empowerment in various literature (19). Most often these terms are referring to women‘s ability to make decisions on issue that affect themselves and their families. They also frequently referred to as ability to affect one‘s own wellbeing, and make strategic life choices (19).

Maternal empowerment has an inevitable role in production of food, management resources, income generation, household food and nutrition security and child welfare (20). Moreover, where rural women control assets and decide what to produce, they tend to favor the production of food crops that ensure food security for the family in contrast to Men who more frequently show a preference for cash crops sold on markets (21). Various initiatives have thus sought to promote homestead food production—particularly of fruits, vegetables, and livestock—by women who can combine such production on gardens with household chores and the care of children, with encouraging results in dietary diversity (22).

Greater household autonomy allow women to choose the most efficient and economical use of their time. Hence, the more control a woman has over her own time and household resource, the more likely; to make a timely decision to treat her sick child after discovering an illness, to make use of health services and follow through with treatment recommendations, to have the child immunized, to obtain and prepare a special food for a child, and feed it to the child at an appropriate frequency and with the degree of patience required. She may also be more likely to make use of health services for her own care during illness, for ongoing gynecological care, and for prenatal and birthing care (23).

There is no universal consensus on measurement of maternal empowerment but one review demonstrated that household decision making, access to or control over resources, mobility/freedom of movement are almost universal direct indicator of empowerment at household/individual level (19). Two separate indicator of empowerment were developed in EDHS 2011. These indices are: the number of participation in decision making process and the number of situations in which a woman considers wife beating is justifiable. These indices use three questions on decision making process and five questions on attitude toward wife beating separately. They were developed based on the idea that, if the mother lacks autonomy on three decisions making process and justified wife beating, it reflects women‘s low status and can predict demographic and health outcomes, including contraceptive use, ideal family size, unmet need for family planning, access to reproductive health care, and, for the Woman‘s children, childhood mortality(10).

Many studies have looked for associations between indicators of women's empowerment and child nutrition and survival (24) .Some literature read that enhancing women's status leads to more investment in their children's education, health and overall wellbeing (15, 19). Maternal disempowerment is not only related with child nutrition and growth but also it undermine nutritional outcomes as young children grow older (24).Epidemiological studies done in India indicate that intra-household women's empowerment has a strong association with better long-term nutritional status of children (25-26). According to the lancet, evidence supports that there are positive associations between women's empowerment and improved maternal and child nutrition and negative associations between disempowerment such as domestic violence and child nutrition outcomes. A study done in Japan revealed that domestic violence had significant and negative effects on both height- and weight-for-age of children under the age of five year (27). Studies done in Ethiopia, Tanzania and India also indicated that involvement in decision making related to maternal own and child care had a significant association with an association with protein energy malnutrition (28-30).

A case control study done in Northwest of Ethiopia indicated that only paternal decision making to use money in the household expenditure was strongly associated with malnutrition among under five children than that of decision made by both father and mother jointly (31). Another studies done in south Africa, Egypt and India also supported that involvement in decision making related to household expenditure had a relationship with risk of undernutrition (32 ,33 and 34). However, studies done in Bangladesh , and Tanzania established that maternal involvement in decision making process of household resources allocation /expenditure didn't had statistical association with PEM in that particular set up (29 and 35). To study done in India, the risk of PEM had shown significant difference among children of mothers who had freedom of mobility and not (33).

5.1.2 Food insecurity and protein energy malnutrition

According to the United States Agency for International Development (USAID), food security is defined as a state in which all people at all times have both physical and economic access to sufficient food to meet their dietary needs for a productive and healthy life(36). The USAID in 1992 also acknowledged food insecurity as one of the three most important underlying causes of malnutrition in children under the age of five year (36).

Because of its complexity, multidimensional concept, measuring food insecurity become a challenges for both researcher and practitioners too. To solve this challenge, USAID Food and Nutrition Technical Assistance (FANTA) project prepare Household Food Insecurity Access Scale (HFIAS), which provide a means for food security programs to easily measure the impact of their programs on the access component of household food insecurity (36).The method is based on the idea that the experience of food insecurity (access) causes predictable reactions and responses that can be captured and quantified through a survey and summarized in a scale(36). It uses nine generic questions that represent apparently universal domains of the household food insecurity experience and can be used to assign households and populations along a continuum of severity, from food secure to severely food insecure. Of course, understanding and measuring the impact of programming on the utilization component of food insecurity is equally important, but is better accomplished using other measurement tools, such as anthropometric indicators (36).

The risk factors of malnutrition are multifaceted and complex, and the relative importance of each of the known risk factors of malnutrition including household food insecurity is likely to vary between settings (37). Food insecurity is probably one of the determinant factors of malnutrition in developing countries, but its role remains unclear (37). In particular, it is not known whether all children suffer from household food insecurity and at what extreme levels. Some studies have shown that in times of food insecurity, mothers are likely to reduce their own intakes to secure those of infants and small children (38 and 39).

A cross-sectional study done in Colombia revealed that there is an important link between household food insecurity and child nutritional status in participants of a food assistance program (40). Similar study in Ghana demonstrated that compared to children in food insecure households, children in food secure households were 46% protected from chronic malnutrition (38). Study from Nepal established that there is a significant association between household food insecurity and childhood stunting (39). However, another study done the same country Nepal showed that there is no significant association between household food insecurity and under nutrition among children in the age group of 6-36 month (33, 37 and 41). Additional studies done in different part of the world revealed that there is significant association between food insecurity

and malnutrition (32, 33, 38-41 and 42-44). A study done in Brazilian children showed that children living with some level of food insecurity have worse rates of stunting, even controlling for demographic and socioeconomic factors (40).But, studies done in east rural Ethiopia found that food insecurity had no significant association with protein energy malnutrition (30 and 45).

5.1.3 Unhealthy environment and protein energy malnutrition

Although lack of food is obviously an important reason for malnutrition, recent reports and studies ever more consistently suggest that much of malnutrition is actually caused by poor sanitation and disease, especially in young children (46 and 47). But, contrary to popular perception, in many countries where malnutrition is widespread, insufficient food production is often not the determining factor of malnutrition (47 and 48). Repeated infections, especially diarrhea, and helminthes, caused by poor environmental conditions (inadequate water and sanitation provisions and poor hygienic practices) are the cause for the 50 percent of malnutrition (stunting, underweight) in children under the age of five year (47 and 48).These growth-faltering effects, in turn, make individuals more predisposed to infections and even to chronic diseases later in life (49). Poor environmental condition can result in maternal anemia in pregnant women by exposing them to malaria and hookworm infections. These condition causes malnourishment of the fetus called intrauterine growth restriction (IUGR) which a potential predicator of low birth weight and ultimately, growth failure (49). Study done in Kwara State of Nigeria and Somalia region of Ethiopia showed that malnutrition had a significant association with sanitation in children under the age of five year (50, 51). Unmatched case control study conducted in Machakel Woreda of Northwest Ethiopia also found that using unprotected source of water for drinking had a significant association with protein energy malnutrition (31). In contrast, similar study in southern Ethiopia demonstrated that unavailability of latrine in household has no significant association with protein energy malnutrition among children under the age of five year (28).

5.1.4 Child feeding practice and Protein energy malnutrition

Human breast milk provides all the nutrients newborns need for healthy development and also provides important antibodies against common childhood illnesses. Exclusive breastfeeding prevents babies from ingesting contaminated water that could be mixed with infant formula. The protective benefits of breastfeeding have been shown to be most significant with 6 months of

exclusive breastfeeding and with continuation after 6 months, in combination with nutritious complementary foods (solids), up to age two (52).

There are a multiple of epidemiological done on the relationship between malnutrition and child feeding practice both nationally and globally. A prospective cohort study in Abidjan, Coˆ Te d'Ivoire, evidenced that adequate feeding practices around the weaning period are crucial to achieving optimal child growth. Unmatched case control study done in Mekakele woreda of south west Ethiopia indicated that squeezed out of colostrums has significant positive association with protein energy malnutrition (31). Similar study conducted in southern Ethiopia revealed that suboptimal complementary feeding has significant positive association with protein energy malnutrition (28). A community based matched case control study done in southern Ethiopia revealed that inadequate complementary feeding and exclusive breast feeding have a significant positive association with protein energy malnutrition (28). Similar study in Gondar hospital also revealed that lack of exclusive breast feeding and initiation of complementary feeding after one year of age have a significant positive association with protein energy malnutrition (53). Many studies done in different part of the world like Ethiopia, Bangladesh and Nepal explored that practice of exclusive breast feeding had a negative significant association with protein energy malnutrition (29, 30, and 53-54).

5.1.5 Protein energy malnutrition and socio-demographic characteristic

Evidence in Bangladesh showed that there is a strong relationship between household wealth status and stunting and it recommend that to improve the health and nutritional status of children by giving due consideration to household wealth is crucial (58 and 59). Another study in this country showed that unlike the education of mothers, the education of fathers independently influenced the nutritional status of children and they deduced that a one-year increase in schooling of the father can reduce 11% of stunting in children (55). Analysis of a national survey in Zambia also showed that sex and age of the Childs were found to be strong predictors of childhood nutritional status (60).

To bring to close the review, the risk factors of malnutrition are multifaceted and complex, and the relative importance of each of the known risk factors of malnutrition including household food insecurity is likely to vary between settings. it has long been recognized that poor

socioeconomic status, low education, sub-optimal nutrition and poor environmental and personal hygiene, low nutritional status of the mother as a major risk factor of under nutrition. Some survey studies also explored that low maternal empowerment and food insecurity as risk factor of moderate and acute malnutrition.

To criticize on methodological aspect of studies done before, , there is no sound empirical study that simultaneously investigates the role of maternal empowerment and food insecurity on the estimated risk of PEM in 6-36 month children, especially in Ethiopia. Of course, food security can be resulted by enhancing maternal empowerment, but an empowered mother can be food insecure because the cause of food insecurity can be from other direction. Therefore, after checking their co linearity it is better to control food security status of the household during analysis to detect existing effect of household maternal empowerment on nutritional status of children under the age of five year.

5.2 Researcher questions

- ✓ Does household maternal empowerment status significantly associated with stunting, underweight and wasting among children aged 6-36 month who visited to Butajira hospital and health center.
- ✓ Does household food security status have a significant association with stunting, underweight and wasting among children aged 6-36 month who visited to Butajira Hospital and Health Center

Hypothesis

- ✓ **H_{A1}:** There is a significant association between household maternal empowerment status and stunting, underweight and wasting among children 6-36 month age children to Butajira hospital and health center.
- ✓ **H_{A2}:** There is a significant association between food security status and stunting, underweight and wasting among 6-36 month old children who visited to Butajira Hospital and Health Center.

5.3 Conceptual Framework

The conceptual framework presents a useful generalized understanding of how PEM is the outcomes of a multi-sectoral development problem that can be most effectively analyzed in terms of immediate, underlying, and basic causes. Inadequate dietary intake and suffering from illness are the two immediate causes of PEM and operate at individual level. This outcome thus refers to a physiological process that influenced by both diet and illness. The double arrow between diet and infection indicate that a well known diet-infection cycle which describe inadequate nutrient intake results in lowering of immunity and ultimately increased incidence, severity and duration of illness and at the same time, illness increases nutrient requirements and exacerbate loss of nutrients associated with a loss of appetite, cycling back to further lower nutrient intake.

Household food insecurity, inadequate maternal and child care, and inadequate health services and health environment are the underlying causes of malnutrition and they operate at household level. In the conceptual framework, the degree to which the three underlying causes are expressed, positively or negatively, is a question of available resources. These include the availability of food, the physical and economic access which an individual or household has to that food, the caregiver‘s knowledge of how to utilize available food and to properly care for the individual child, the caregiver‘s own health status, and the control the caregiver has over resources within the household that might be used to improve the nutritional status of the child. Additionally, the level of access to information and services for maintaining health, whether curative services are available, and the presence or absence of a healthy environment with clean water, adequate sanitation, and proper shelter all contribute to determining the nutritional status of an individual child.

The less control a woman has over her own time and household resource, the less likely; to make a timely decision to treat her sick child after discovering an illness, to make use of health services and follow through with treatment recommendations, to have the child immunized, to obtain and prepare a special food for a child, and feed it to the child at an appropriate frequency and with the degree of patience required. She may also be less likely to make use of health

services for her own care during illness, for ongoing gynecological care, and for prenatal and birthing care (23).

Given the link between maternal empowerment with underlying cause of malnutrition it can be affected by level of education, employment status, particularly employment for cash, and media exposure. Women who are educated, employed, and exposed to the media are likely to be better equipped with the information and the means needed to function effectively in the modern world. Contextual factors such as urbanization and socio economic development foster the above factors in terms of availing opportunities to education, employment and media access (61-62).

The three underlying causes of malnutrition are in turn the result of more basic causes.
The basic cause of malnutrition are related to the availability and control of human, economic and organizational resources in a society, themselves the result of previous and current technical and social conditions of production together with political, economic and ideological-cultural factor. Food security is frequently discussed at this level and it is useful to examine the distinction between global or national food security and household food security to better understand the relationship between food security and nutrition.

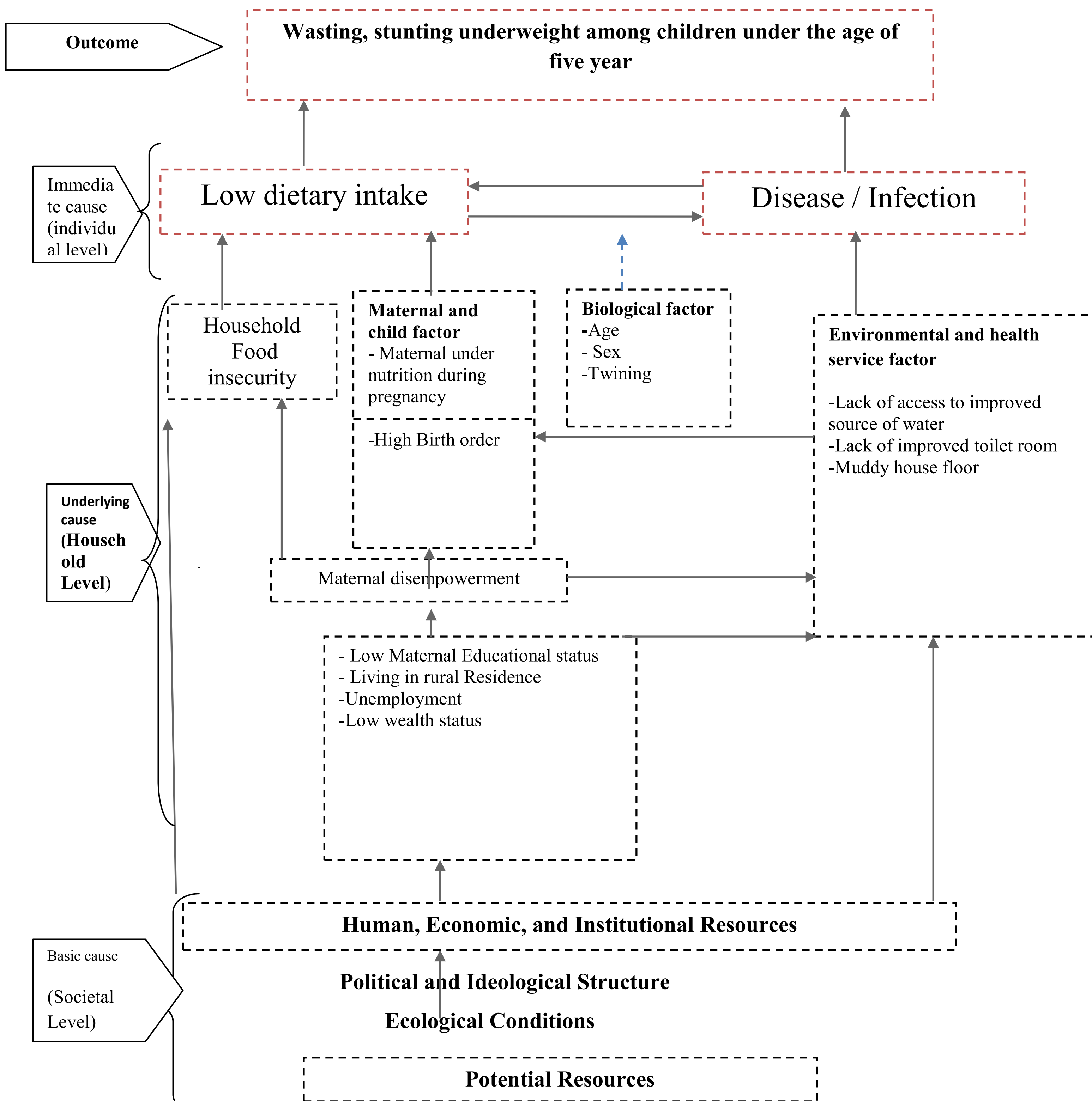

Figure : Conceptual framework on cause of malnutrition in children under the age of five year adapted from UNCEF 1990 (63).

5. Objective

6.1 General objective

- To assess the relationship between household maternal empowerment and food security status with stunting, underweight and wasting among 6-36 month old children who visited to Butajira hospital and health center in Butagira town of Gurage Zone during period of February 20 to April 20, 2015.

6.2 Specific Objectives

- To determine the link between household maternal empowerment status and stunting, underweight and wasting among children aged 6-36 month who visited to Butajira hospital and health center in Butajira town of Gurage Zone
- To determine the association between household food security status and wasting, stunting and underweight among children aged 6-36 month who visited to Butajira Hospital and Health center in Butajira town of Gurage Zone

6. Methods

7.1 Study area and period

The study was conducted in Butajira hospital and health Center located in Butajira town of Gurage Zone. The area is located 135 km south of Addis Ababa and 50 km to the west of Zeway town. Various ethnic groups are living in the town but predominantly it is inhibited by Gurage and Silte. Islam and Orthodox Christianity have most followers relative to other religions. The livelihood of the residents is mainly based on agricultural product and hence, Khat and chilli-peppers, teff are the main cash crops, while maize and enset (**False banana)** are the main staples food of the resident. High cereal prices during the harvest and immediate post-harvest period (Nov and Dec), pest infestation of enset (January –April), lack of pasture and water for livestock (April to May) and unstable summer rain fall (June to August) are the most common causes of food insecurity in the zone. Currently, Butajira town has one hospital, one health centre and several privately owned drug stores and clinics. The health centre has been offering different health care service and therapeutic feeding. Butajira hospital is the zonal hospital of Gurage Zone which constitutes a total of 144 beds and five major wards like pediatric, gynecology, obstetric, surgery, and medical wards and one therapeutic feeding center. Malnutrition, pneumonia, malaria, neonatal sepsis and diarrhea are the top five causes of morbidity in children under the age of five year in this particular set up. The data for the study were collected during period of February 20 to April 20, 2015.

7.2 Study design

Health facility based unmatched case–control study design was applied to determine the existing exposure difference between case and control

7.3 Source population

All 6-36 month children who visited the selected health institution were the source population of the study.

7.4 Study population

All eligible 6-36 month old children who visited the outpatient department (OPD) of the selected health institution during study were the study populations.

Inclusion criteria

1. Children who visited to the selected health institution for medical purpose
2. Children who fallen in the age group of 6-36 month
3. Children who had a mother as a caregiver
4. A child and mother who lived in Gurage zone for at least six month.

Exclusion criteria

1. Orphan children or children separated from his or her mother by any reason
2. Children with mother who can't speak and give organized information
3. Children with HIV (applicable only for control)
4. Children with severe burn, coma for both population
5. A child with mother who had widowed ,divorced and single marital status

7.5 Sample size determination

The total Sample size was calculated through statistical program of Epi-info v.7. Two major exposure variables (food insecurity and maternal disempowerment) were taken in to consideration during sample size calculation and the same assumptions were used for both variables except the proportion of exposure among controls (Table 1). Finally, the one which come up with maximum sample size was taken. The following assumptions were taken to come up with the final sample size.

- ✓ 95% confidence level
- ✓ power of 80%
- ✓ case to control ratio of 1:2
- ✓ detecting 2.1 times difference in food insecurity among cases
- ✓ Proportion of food insecurity among normal children =25.3 %

Based on the above assumptions, with additional 10% for non response rate, total sample size required to detect the existing difference was equal to 348 with 116 cases and 232 controls.

Table Tabular presentation of total sample size needed to investigate each major exposure variable

Major exposure variable to be studied	Assumptions					Total sample size with 10 % non response		
	Two sided Confidence level	Power	Odd ratio	Proportion of controls exposed	Case to control	Case	Control	Total
husband is the predominant decision maker in household money expenditure	95%	80%	2.1	56 %	1:2	115	231	346
Food insecurity	95%	80%	2.1	25.3%	1:2	116	232	348

7.6 Sampling techniques and procedures

For proportionally allocating the total sample size to the purposely selected health institution, 2014 quarterly patient flow for three consecutive months was used and based on that the average monthly patient flow was calculated. Then, the total sample size that was allocated to Butajira hospital was 265 (192 controls and 73 cases and to Butajira health center is 83(40 controls and 43 cases) (Figure 4.2). In each health institution, control participants were selected by systematic sampling technique. the first control participant (in both hospital and health center) was selected by lottery method from the first three card registry at the beginning of the day; then the third order patient that was come after the first selected control was selected as the second control participant and then the whole selection procedure was continued as such daily until the allocated sample size was attained. All cases who visited to OPD of both health institutions were selected as case participant without living any interval between them if they were eligible for the study (Figure 2).

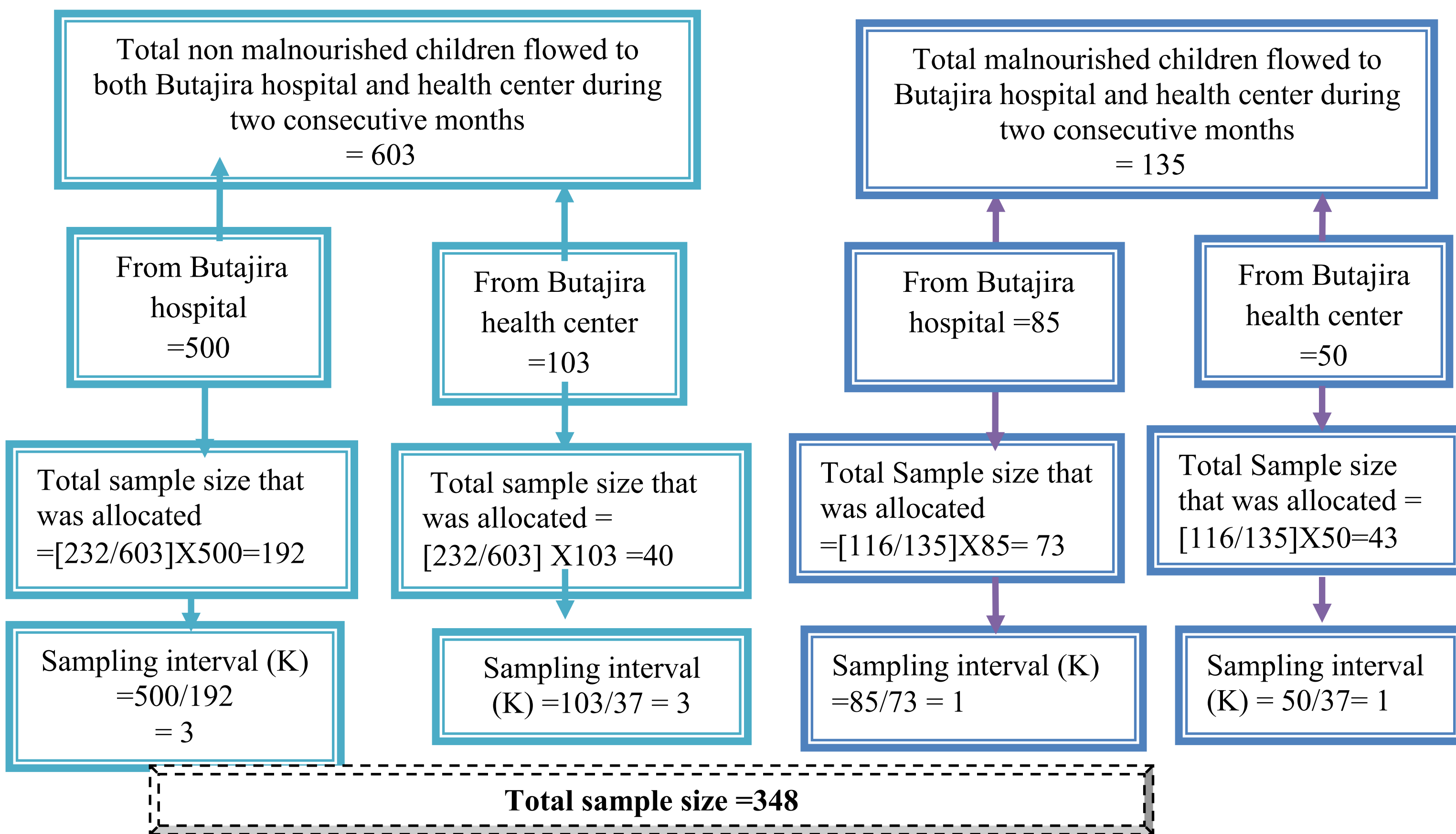

Figure : Schematic presentation of sampling techniques

7.7 Study variables

Dependent variable

- ✓ **Wasting**
- ✓ **Stunting**
- ✓ **Underweight**

Independent variables

- ✓ household food security status
- ✓ Household maternal empowerment status
- ✓ Justification for wife beating
- ✓ Household wealth
- ✓ Maternal height
- ✓ Maternal BMI
- ✓ Maternal age
- ✓ Maternal occupation
- ✓ Educational level of the mother
- ✓ Access to improved water sources
- ✓ Sanitation
- ✓ Flooring type of the household
- ✓ Sex of the child
- ✓ Age of the child
- ✓ Birth order of the child
- ✓ Twinning
- ✓ Religion
- ✓ Residence

7.8 Operational definitions

Adequate Access to improved source of water: - Getting water from piped, protected ground water (wells, springs) source within one kilometer or <15 minute which is enough for daily need.

Improved sanitation: A sanitation that constitutes one of the following: Connection to a public sewer, Connection to a septic tank system, Pour-flush toilet, Hygienic pit toilet, Ventilated improved pit (VIP) toilet (47).

Unimproved sanitation: A Sanitation options which are not considered “improved” include: Public or shared toilet, open pit toilet, Bucket toilet (37).

Disempowered mother: - A mother who lack autonomy to decide lonely or jointly with her husband in any of the following three decisions making process: (1) her own and child health care (2) allocation of household resource / household expenditure and (3) visits to family or relatives or health institution.

partially disempowered mother: A mother who have the autonomy to participate lonely or jointly with her husband in one or two of the following three decisions making process: (1) her own and child health care (2) allocation of household resource /income for household expenditure/purchase, and (3) visits to family or relatives or health institution

Empowered mother: A mother who has the autonomy to participate lonely or jointly with her husband in all of the following three decisions making process: (1) her own and child health care (2) allocation of household resource /household expenditure and (3) visits to family or relatives or health institution.

Wife beating unjustified: If a mother doesn‘t give any justification for wife beating

Wife beating justified: If a mother justified wife beating in at least one of situation from the five justifications: if the wife burns the food, argues with her husband, goes out without telling husband, neglects the children, or refuses sexual intercourse with her husband.

Food secured household: A household experiences none of the food insecurity (access) conditions, or just experiences worry for not having enough food at most two times in previous four week.

Mildly food insecured household: A household who worries about not having enough at least for three times in previous four week, and/or A household who unable to eat preferred foods at least once in previous four week and/or eats a more monotonous diet or some foods considered undesirable at most two times in previous four week

Moderately food insecured household: A household who eat undesirable foods at least three times in previous four week and/or has started to reduce the size of meals or number of meals at least for one times and at most for ten times in previous four week

Severely food insecured household: A household who has started to reducing the size of meals or number of meals more than ten times in previous four week and /or experiences any of the three most severe conditions (running out of food, going to bed hungry, or going sleep a whole day and night without eating), at least once in previous four week

Cases:-Those children who had Weight for height Z<-2 SD (wasted or Weight for age Z<-2 SD (under weight) or Height for age Z<-2 SD (stunted) or for those who had no edema or Child who had bilateral pitting edema.

Controls: Those children who had Z>= -2 SD in any of anthropometric index provided that free of edema.

7.9 Data collection procedures and techniques

Structured and interviewer administered questionnaires was adapted from literature. It was consists of questions that could measure maternal empowerment status, socio-economic and demographic factors, child characteristics, and environmental health condition of the household and nine generic questions that were used to measure household food insecurity. Since it was written in English version it was translated in to Amharic version for common understanding.

Prestige scale and measuring board instruments were used to measure the weight and height of children. Weight was measured in undressed or with minimum clothing and the weighting scales was calibrated with known weight object regularly. The scales indicators were checked against zero reading after weighing every child and mother. Edema was checked by simultaneous pressing of the feet of the child for three second. Then, if there was bilaterally pitting the child was ascertained as a case of undernutrition.

By basing previous experience on data collection activity and supervision, three diploma nurses and one health officer were recruited from Meskan districts of Gurage zone.

7.10 Data quality management

The sample of questionnaire was pre- tested on population out of study area and later, necessary modification was taken. Intensive two day training was given for both the data collectors and supervisor on the objective of the study, procedure and technique that they should follow during interviewing and measuring anthropometry. During period of data collection close supervision was done by supervisor and principal investigator.

7.11 Data analysis

To minimize data entry error, the collected data were entered into EPI data 3.1 computer programs and exported to Statistical Package for Social Sciences version 21 for cleaning, recoding, categorizing and analyzing. To identify case and controls anthropometric data were used and analyzed manually by using WHO growth reference with WHO child growth standards and rechecked through Emergency Nutrition Action software (ENA). Other statistical analysis was done by SPSS version 21. The wealth statuses of the households were assessed by using twelve major variables (electricity, electric mitad, fridge, automobile, television, radio, latrine type, type of household floor, land and availability of poultry and other farm animal) and analyzed through principal component analysis. Before doing principal component analysis the value of each wealth variables were recoded as ‗0‘ and ‗1‘. Later principal component analysis was done and the result of the finding was categorized into five groups: first quintile, second quintile, third quintile, fourth quintile, fifth quintile and coded 1,2,3,4 respectively. The empowerment status of mothers were assessed by using three questions that focused on decision related to resource allocation, own and child health care and mobility. The mothers were asked about whether they made decision lonely or jointly with their husband. If they responded as lonely or jointly they were categorized as ‗yes‘ and coded ‗1‘ and responded as husband only they were categorized as ‗no‘ and coded ‗0' and the responses from three questions were summed to produce index of empowerment. The index had shown significant internal consistency (Cronbach‘s alpha = 0.70). Later on, those participants who had index score of ‗0‘ categorized as disempowered and coded ‗3‘; those who had score of ‗1or 2‘ categorized as partially empowered and coded ‗2‘; and those who had score of ‗3‘ were categorized as empowered and coded ‗1‘.

Household food insecurity status of the participants was assessed by using nine generic questions of HFIAS that were developed by FANTA. The respondent were asked about question related to Anxiety and uncertainty about the household food supply, Insufficient Quality (includes variety and preferences of the type of food), Insufficient food intake and its physical consequences in the past four weeks with their frequency. By using the standard criteria of household food insecurity (access) prevalence domain, households were categorized into four level (Foods secure, and mild, moderately and severely food insecure). This domain was selected because result from complete set of questions does a better job of distinguishing the household food insecurity level than result from each individual questions.

Descriptive statistics like mean, frequency and percentage were calculated as univariate analysis. To evaluate the association between a single independent variable with dependent variable crude odds ratio was used and those variable that had p-value of less than 0.05 were included in the advanced model of analysis. By using the Variance Inflation Factor (VIF) and tolerance test multicollinearity was tested among eligible independent variables. The result of the VIF ranges from 1.225–2.519 while the tolerance test was less than one; both were within the normal limit. Since the outcome variable was categorical type, adjusted odds ratio was calculated through binomial multiple logistic regressions model. Model fitness was checked by Hosmer and Lemeshow goodness of fit test and later 95% CI were used to test statistical significance of the association between dependent and independent variables.

7.12 Ethical considerations

The research proposal was submitted to research ethics committee of Addis Ababa University, School of Public Health and later, ethical clearance was obtained from there. Letters of permission was obtained from Gurage zone health bureau by referring them to communicate with letter of Addis Ababa University, School of Public Health. Cooperation letter to Butajira Hospital and Health Center was obtained from both the School of Public Health and Gurage Zone health bureau and then, People at different managerial levels in the study area were communicated through written letters from the two institutions. The objective of the research, procedure that was going to be done, risk and benefit of the research, way of securing the confidentiality of the information and voluntariness of participation was explained in right way to selected participant. Finally, informed consent was obtained from the selected respondent prior to the interview.

13.12 Dissemination of the findings

The main finding of this research will be disseminated to the concerned body in the form of presentation, hard copy and publication. The hard copy of the whole research paper will be submitted to School of Public Health of AAU and Gurage Zone Health Bureau. It will be presented to the Gurage Zone Health Bureau and different workshop on thematic area if there is.

7. Results

A total of 348 child-mother pairs (116 cases and 232 controls) were planned to be studied in the project but for various reason only 115 cases and 231 controls were delightful for invitation, which give us the overall response rate of 99.4 %.

8.1 Results from univariate analysis

8.1.1 Socio-demographic characteristic

Of those children who were included in the analysis, most of cases and controls were Muslim**.** While the majority of controls were from urban area, almost fifty percent of stunted, underweight and wasted children were from were from rural area. The majority of stunted, under weight and wasted children and children free of theses morbidity had parents who had formal education. Pertaining to maternal occupation more than 95 % of mother of stunted ,underweight and wasted children engaged in work other than government or private organization. Similarly, more than 85% of normal children were had unemployed mother. 9 (7.8%) of cases and 37(16%) of controls were working as an employee in governmental and nongovernmental organization. (Table 2).

Table : The result of univariate analysis by socio demographic covariates of undernutrition in Butajira Hospital and Health Center, Gurage Zone, SNNPR, April, 2015

Explanatory variable	Category	Child nutritional status					
		Stunted Nº(%))	Normal Nº (%)	Under weight	Normal	Wasted	Normal
Maternal educational level	Never attend school	26 (38.2%)	72(26.3%)	34(37.8%)	64(25.3 %)	30(49.2%)	68(24.2%)
	Primary	31(45.6%)	120(43.8 %)	36(40%)	115(45.6%)	18(29.5 %)	133(47.3%)
	Secondary	10(14.7%)	46 (16.9%)	15(16.7%)	41(16.3%)	10(16.4%)	46(16.4 %)
	Vocational/Diploma	1 (1.5%)	36(13.1%)	5(5.6%)	32(34.7%)	30(49.2 %)	68(24.2%)
Paternal level of educational	Never attend	50(18.1%)	29(41.1%)	33(35.9%)	46(18.1%)	22(35.5%)	57(20.1%)
	Primary	103(37.3%)	21(30%)	32(34.8%)	92(36.2%)	22(35.5%)	102(35.9%)
	Secondary	71(26.0%)	12(17.4%)	16(17.4%)	67(26.3%)	13(20.9 %)	70(27.6%)
	Vocational/Diploma	32(11.6%)	4(5.8%)	6(6.5%)	30(11.8 %)	3(4.8%)	33(11.6 %)
	Higher education	21(7.6%)	3(4.3%)	5(5.5%)	19(7.5%)	2(3.2%)	22(7.7 %)
Maternal occupation	Employer	3(4.3%)	43(15.5%)	9(9.8 %)	37(14.6%)	3(4.8%)	43(15.1%)
	Merchant	12(17.4%)	50(18.1%)	18(19.6%)	44(17.3%)	12(19.3%)	50(17.6%)
	house wife	54(78.3%)	184(66.4%)	65(70.7%)	173(68.1 %)	47(75.8%)	191(67.3%)
Paternal occupation	Employer	12(17.1%)	77(27.9%)	20(21.7%)	69(27.2 %)	10(16.1%)	79(27.8%)
	Farmer	33(47.1%)	81(29.3%)	42(45.7%)	72(28.3%)	33(53.2%)	81(28.5%)
	Merchant	25(35.7%)	118(42.8%)	30(32.6%)	113(44.5%)	19(30.6 %)	124(43.7%)
Maternal age group	15-20	7(10.1%)	14(16.7%)	3(3.3%)	18(7.1 %)	0(%)	21(7.4%)
	21-25	27(39.1%)	104(37.5%)	38(41.3%)	93(36.6%)	21(33.9%)	110(38.4%)
	26-30	27(39.3%)	126(45.5%)	37(40.2%)	116(45.7%)	28(45.1%)	125(44.0%)
	>=31	8(11.6%)	33(11.9%)	14(15.2%)	27(10.6%)	13(21%)	28(9.8 %)
Maternal height	<145cm	2(2.9%)	1(%)	5(%)	225(%)	1(%)	5(%)
	>=145cm	67(97.1%)	89(%)	248(%)	29(%)	59(%)	278(%)
Maternal BMI	>=18.5	66(95.7%)	244(89.1 %)	85(92.4%)	225(88.6 %)	57(91.9%)	253(89.1%)
	<18.5	3(4.3%)	30(10.8%)	7(7.6%)	29(11.4%)	5(8.1%)	31(10.9%)
Household wealth	1st quintile	3(4.3%)	48(13.3%)	8(8.7 %)	43(16.9%)	6(9.7%)	45(15.8%)
	2nd quintile	21(30.4 %)	100(36.1%)	28(30.4%)	93(36.6%)	17(27.4%)	104(36.6 %)
	3rd quintile	3(4.3 %)	22(7.9%)	5(5.4%)	20(7.9%)	2(3.2%)	23(8.1%)
	4th quintile	18(26.1%)	41(14.8%)	22(23.9%)	37(14.6%)	14(22.6 %)	45(15.8%)
	5th quintile	24(34.9%)	66(23.8%)	29(31.5%)	61(24%)	23(37.1%)	67(23.6%)
Religion	Orthodox	19 (27.5%)	86 (31%)	23(25%)	82(32.3%)	17(27.4%)	88(30.9 %)
	Muslim	46 (66.6%)	171 (61.7%)	63(68.5%)	154(60.6%)	41(66%)	176(62%)
	Protestant	4 (5.7%)	20 (7.2%)	6(6.5%)	18(7.1%)	4(6.5%)	20(7.4%)
Residence	Urban	29(43.9%)	191(69 %)	42(47.8%)	178(70.1%)	27(45.8%)	193(67.9%)
	Rural	37(56.1%)	76(27.4 %)	46(52.3%)	67(27.3%)	32(54.2%)	81(28.5%)

8.1.2 Child characteristics

Almost equal proportions of children in both cases and controls were male. Higher proportion of children in both groups were aged 24 month and below. More than ninety five percent of cases (stunted, wasted and underweight) and controls were singleton. Looking at the birth order of the participants, small proportion of cases and controls had fourth and above order (Table 3).

Table : Characteristics of the study children by their nutritional status in Butajira Hospital and Health Center, Gurage Zone SNNPR, April, 2015

Explanatory variable	Category	Children nutritional status					
		Stunted	Normal	Under weight	Normal	Wasted	Normal
Sex of child	Male	34(49.3%)	146(52.7%)	41(44.6%)	139(54.7%)	31(50.0%)	149(52.5%)
	Female	35(50.7%)	131(47.3%)	51(55.4%)	115(45.3%)	31(50.0%)	135(47.5%)
Child age group	6-24month	43(62.3%)	210(75.8%)	73(79.3%)	180(70.9%)	53(85.5%)	200(70.4%)
	>24 month	26(37.9%)	67(24.2) %)	19(20.7%)	74(29.1%)	9(14.5%)	84(29.6%)
Birth order	First order	23(33.3%)	101(36.5%)	28(30.4%)	96(37.8%)	17(27.4%)	107(37.7%)
	Second order	20(29%)	102(36.9%)	28(30.4%)	94(37.0%)	15(24.2%)	107(37.7%)
	Third order	12(17.4%)	40(14.5%)	16(17.4%)	36(14.2%)	12(19.4%)	40(14.1%)
	>= Fourth order	23(33.3%)	33(12%)	20(21.7%)	28(30.4%)	18(29.0%)	30(10.6%)
Twining	Yes	3(0.4%)	1(0.3%)	3(0.3%)	1(0.4%)	3(4.8%)	1(0.3%)
	No	66(9.6)	276(99.7)%)	89(9.7%)	253(95.2%)	59(99%)	283(99.7%)

8.1.3 Indicator of maternal empowerment status

More than fifty percent of stunted, under weight and wasted children had mothers who couldn‘t decide on their own and child health care. In contrast, only thirty percent of children free of wasting, stunting and underweight had mothers who couldn‘t decide on their own and child health care. More than sixty percent of stunted, under weight and wasted children and free of wasting, stunting and underweight had mothers who could decide on both small and large household expenditure respectively. Even if the proportion varies for case and control, the

proportion of mothers who could decide on their mobility to relevant places were less than fifty percent. Regarding justification for wife beating, almost more than fifty percent of percent of of cases and controls had mothers who justified wife beating. Table 5 below showed that the result of the indicator of maternal empowerment status by the nutritional status of study children in study area (table 4).

Table : Indicators of maternal empowerment by study children nutritional status in Butajira Hospital and Health Center, Gurage Zone SNNPR, April, 2015

Empowerment indicators		Study children nutrition status					
		Stunted	Normal	Under weight	Normal	Wasted	Normal
Decision maker on own and child health care	Mother only or jointly with husband	16(23.2%)	200(72.2%)	39(42.4%)	177(69.7%)	28(45.2%)	188(66.2%)
	Husband only	53	77 (27.8%)	53(57.6%)	77(30.3%)	34(54.8%)	96(33.8%)
Decision maker on both small and large household expenditure	Mother only or jointly with husband	49 (71.1%)	177 (64%)	58(63.0%)	163(64.2%)	38(61.3%)	173(60.9%)
	Husband only	20 (29%)	100	34(37.0%)	91(35.8%)	24(38.7%)	111(39.1%)
Decision maker on mobility to relatives, friends or	Mother only or jointly with husband	12 (71%)	120 (43.3%)	69(75%)	145(57.1%)	16(25.8%)	116(40.8%)
	Husband only	57 (82.6%)	157 (56.7%)	23(25%)	109(42.9%)	46(74.2%)	168(59.2%)
Justification for wife beating	Mothers agree with at least one specified	46 (66.6%)	145 (52.3%)	62(67.4%)	129(50.8%)	44(71.0%)	147(51.8%)
	Mothers didn‘t agree with any of specified reason	23 (33.3%)	132 (47.6%)	30(32.6%)	125(42.9%)	18(29.0%)	137(48.2%)

8.1.4 Maternal empowerment status

By considering control over resources, freedom of movement, the autonomy to decide upon own and child health care as direct indicator of household maternal empowerment, this study explored that 41(59.4%) stunted, 41(44.6%) underweight, and 27(44.3%) of wasted children had disempowered mother respectively where as of 231 children free of stunting, underweight and wasting 46(16.6%), 46(18.1%), 46(18.1%) of them had disempowered mother respectively. Table 6 below showed that the tabular presentation of the frequency distribution of empowerment status across the two population (table 5)

Table : **Table: Maternal Empowerment status by study Children nutritional status in Butajira Hospital and Health Center, Gurage Zone, SNNPR, April, 2015**

Overall maternal empowerment status	Children nutritional status					
	Stunted	Normal	Under weight	Normal	Wasted	Normal
Empowered	**6(8.7%)**	**92(33.4%)**	**13(14.1%)**	**85(33.5%)**	**9(14.8%)**	**89(31.6%)**
Partially empowered	**22(31.9%)**	**139(50.2%)**	**38(41.3%)**	**123(48.4%)**	**26(42.6%)**	**135(47.9%)**
Disempowered	**41(59.4%)**	**46(16.6%)**	**41(44.6%)**	**46(18.1%)**	**46(18.1%)**	**60(21.3%)**

8.1.5 Household food security status

Based on Household Food Insecurity Access Scale (HFIAS) which was developed by USAIDS, this analytical study comes up with the following finding. Almost twenty five percent of stunted ,under weight and wasted children were assured severe food security and the rest seventy percent experienced deferent degree of food insecurity i.e. mild to severe type food insecurity. Concerning the household food security status of normal children, almost forty six (46%) percent of them had household who assured food security where as the rest 54.3% of them experienced different degree of food insecurity like cases. Table below showed that the frequency distribution of household food security status across the two population(table 6).

Table : Household food security status by the study children nutritional status in Butajira Hospital and Health Center, Gurage Zone, SNNPR, April, 2015

Food security status	Children nutritional status					
	Stunted	Normal	Under weight	Normal	Wasted	Normal
Food secured	**14 (20.6%)**	**131(47.6%)**	**24(26.1%)**	**119(47.2 %)**	**16(26.3%)**	**129(45.7%)**
Mildly insecured	**12(17.6%)**	**52(20%)**	**13(14.1%)**	**50(19.8%)**	**9(14.8%)**	**55(19.5%)**
Moderately insecured	**13(19.1%)**	**53(19.3%)**	**20(21.7%)**	**47(18.7%)**	**14(23%)**	**52(18.4%)**
Severely insecured	**29(42.6%)**	**39(14.2%)**	**34(37%)**	**36(14.3%)**	**22(36%)**	**46(16.3%)**

8.1.6 Result from bivariate and multivariate analysis

This study tried to explore the linkage between maternal empowerment and food security status with the specific variants of undernutrition called stunting, wasting and underweight. After adjusting for potential confounder, maternal disempowerment, moderate and sever food insecurity and living in rural residence were significantly associated with stunting with (AOR 6.66 (95% CI 2.32-19.14), (AOR 4.894 (95% CI 1.66-14.35), (AOR 9.465 (95% CI 3.13-28.57), (AOR 12.17 (95% CI 2.730-54.28) respectively. similarly, underweight were significantly associated with maternal disempowerment, sever food insecurity , living in rural residence and in low wealth quintile household(AOR 2.658 (95% CI 1.067-6.621), (AOR 2.880 (95% CI 1.282-6.469), (AOR 7.102 (95% CI 2.13-23.59), (AOR 5.951 (95% CI 1.70-31.42) respectively . Maternal disempowerment and living residence were not independently associated with wasting but sever food insecurity and being in age group of 24 month and below were significantly associated with wasting(AOR 2.79 (95% CI 1.09-7.16), (AOR 2.5 (95% CI 1.04-6.1) respectively. Tables 7, 8 and 9 in next three pages showed as the result of bivariate and multivariate result by major explanatory variables of stunting, under weight and wasting respectively.

Table : The result of biviariate and multivariate analysis by major explanatory variable of stunting, Gurage Zone, SNNPR, April, 2015

Explanatory variable	Category	Stunting		COR (95 %CI	AOR	95%CI	
		Yes	No			Lower	Upper
Maternal educational level	Never attend school	26 (38.2%)	72(26.3%)	2.69(1.2-5.8)	.29	.07	1.18
	Primary	31(45.6%)	120(43.8 %)	1.9(0.9-4.0)	.67	.23	1.99
	Secondary and above	11(16.2%)	82(30%)	1.00	1.00		
Maternal occupation	Employer	3(4.3%)	43(15.5%)	1.00	1.00		
	Farmer	12(17.4%)	50(18.1%)	3.44(0.9-12.9)	5.40	.86	33.80
	Merchant	54(78.3%)	184(66.4%)	4.3(1.2-14.4)	4.63	.86	24.85
Household wealth	1st quintile	3(4.3%)	48(13.3%)	.163(0.0-0.6)	3.29	.59	18.14
	2nd quintile	21(30.4 %)	100(36.1%)	0.5(0.2-1.1)	1.84	.21	16.25
	3rd quintile	3(4.3 %)	22(7.9%)	0.4(0.09-1.2)	1.70	.20	14.42
	4th quintile	18(26.1%)	41(14.8%)	1.14(0.6-2.3)	1.23	.119	12.78
	5th quintile	24(34.9%)	66(23.8%)	1.00	1.00		
Residence	Rural	37(56.1%)	76(27.4 %)	3.3(1.9-5.8)	12.17	2.730	54.28
	Urban	29(43.9%)	191(69 %)	1.00	1.00		
Child age group	6-24month	43(62.3%)	210(75.8%)	1.00	1.00		
	>24 month	26(37.9%)	67(24.2) %)	1.8(1.1-3.2)	3.50	1.58	7.74
Birth order	First order	23(33.3%)	101(36.5%)	1.00	1.00		
	Second order	20(29%)	102(36.9%)	0.86(0.4-1.7)	.58	.23	1.46
	Third order	12(17.4%)	40(14.5%)	1.3(0.6-2.9)	.614	.20	1.84
	>= Fourth order	23(33.3%)	33(12%)	1.9(0.9-4.3)	.75	.21	2.60
Decision maker on own and child health care	Mother only or jointly with husband	16(23.2%)	200(72.2%)	1.00	1.00		
	Husband only	53 (76.8%)	77 (27.8%)	8.8(4.8-16.5)	8.68	3.8	19.78
Decision maker on both small and large household expenditure	Mother only or jointly with husband	20 (29%)	177 (64%)	1.00	1.00		
	Husband only	49 (%)	100 (36.1%)	4.5(2.5-7.9)	5.03	2.22	11.38
Decision maker on mobility to relatives, friends or health institution, market	Mother only or jointly with husband	12 (71%)	120 (43.3%)	1.00	1.00		
	Husband only	57 (82.6%)	157 (56.7%)	3.7(1.9-7.2)	2.90	1.19	7.06
Justification for wife beating	Unjustified	23 (33.3%)	132 (47.6%)	1.00	1.00		
	Justified	46 (66.6%)	145 (52.3%)	1.9(1.1-3.3)	0.86	0.38	1.96
Overall maternal empowerment status	Empowered	6(8.7%)	92(33.4%)	1.00	1.00		
	Partially empowered	22(31.9%)	139(50.2%)	2.2(0.9-5.2)	1.27	.431	3.74
	Disempowered	41(59.4%)	46(16.6%)	9.1(4.0-20.6)	6.66	2.32	19.14
Food security status	Food secured	14 (20.6%)	131(47.6%)	1.00			
	Mildly insecured	12(17.6%)	52(20%)	1.7(0.7-4.3)	3.018	.93	9.72
	Moderately insecured	13(19.1%)	53(19.3%)	3.3(1.5-7.2)	4.894	1.66	14.35
	Severely insecured	29(42.6%)	39(14.2%)	7.5(3.5-15.7)	9.465	3.13	28.57

Table : The result of biviariate and multivariate analysis by covariates of underweight

Explanatory variable	Category	Under weight		COR (95 %CI	AOR	95%CI	
		Yes	No			Lower	Upper
Maternal educational level	Never attend school	34(37.8%)	64(25.3%)	3.4(1.2-9.5)	1.1	.2	7.1
	Primary	36(37.8 %)	115(45.6 %)	2.0(0.7-5.5)	1.599	.3	9.1
	Secondary	20(22.2%)	73(29.0%)	2.3(0.7-7.1)	3.39	.6	18.6
Maternal occupation	Employer	9(9.8 %)	37(14.6%)	1.00	1.000		
	Farmer	18(19.6%)	44(17.3%)	1.7(0.7-4.2)	2.099	.630	6.995
	Merchant	65(70.7%)	173(68.1 %)	1.5(0.7-3.3	1.335	.461	3.870
Household wealth	1st quintile	8(8.7 %)	43(16.9%)	0.4(0.2-0.9)	4.384	0.91	23.7
	2nd quintile	28(30.4%)	93(36.6%)	0.6(0.3-1.2)	5.951	1.70	31.42
	3rd quintile	5(5.4%)	20(7.9%)	0.5(0.2-1.5)	4.885	.94	26
	4th quintile	22(23.9%)	37(14.6%)	1.3(0.6-2.5)	2.281	1.01	6.31
	5th quintile	29(31.5%)	61(24%)	1.00	1.00	1.00	
Residence	Rural	46(52.2%)	67(27.3%)	2.9(1.7-4.8)	7.102	2.13	23.59
	Urban	42(47.7%)	178(72.7%)	1.00	1.00		
Child age group	6-24month	73(79.3%)	180(70.9%)	1.00	1.00		
	>24 month	19(20.7%)	74(29.1%)	0.633(3.5)	.675	.342	1.332
Birth order	First order	28(30.4%)	96(37.8%)	1.00	1.00		
	Second order	28(30.4%)	94(37.0%)	1.1(0.5(1.8)	.880	.422	1.838
	Third order	16(17.4%)	36(14.2%)	1.5(0.73.1)	.756	.295	1.940
	>= Fourth order	20(21.7%)	28(30.4%)	2.4(1.2-4.9)	.852	.302	2.410
Decision maker on own and child health care	Mother only or jointly with husband	39(42.4%)	177(69.7%)	1.00	1.00		
	Husband only	53(57.6%)	77(30.3%)	3.1(1.9-5.1)	2.3	1.3	4.2
Decision maker on both small and large household expenditure	Mother only or jointly with husband	58(63.0%)	163(64.2%)	1.00			
	Husband only	34(37.0%)	91(35.8%)	3.1(1.9-5.0)	2.5	1.34	4.61
Decision maker on mobility to relatives, friends or health institution, market	Mother only or jointly with husband	69(75%)	145(57.1%)	1.00	1.00		
	Husband only	23(25%)	109(42.9%)	2.3(1.3-3.8)	1.306	0.333	1.267
Justification for wife beating	Unjustified	30(32.6%)	125(42.9%)	1.00	1.00		
	Justified	62(67.4%)	129(50.8%)	2(1.2-3.3)	1.064	0.56	2.022
Overall maternal empowerment status	Empowered	13(14.1%)	85(33.5%)	1.00			
	Partially empowered	38(41.3%)	123(48.4%)	2.0(1.015-4.0)	1.441	.660	3.146
	Disempowered	41(44.6%)	46(18.1%)	5.8(2.8-11.9)	2.658	1.067	6.621
Food security status	Food secured	24(26.1%)	119(47.2 %)	1.00			
	Mildly insecured	13(14.1%)	50(19.8%)	1.3(0.6-2.8)	1.179	.486	2.859
	Moderately insecured	20(21.7%)	47(18.7%)	2.0(1.025-3.9)	1.794	.806	3.992
	Severely insecured	34(37%)	36(14.3%)	4.7(2.5-8.9)	2.880	1.282	6.469

Table : The result of biviariate and multivariate analysis by major explanatory variable Wasting, Gurage Zone, SNNPR, April, 2015

Explanatory variable	Category	Wasting		COR (95 %CI)	AOR	95%CI	
		yes	No			Lower	Upper
Maternal educational level	Never attend school	30(49.2%)	68(24.2%)	2.7(1.3-5.0)	.52	.20	1.24
	Primary	18(29.5 %)	133(47.3%)	0.8(0.3-1.8)	1.69	.50	5.73
	Secondary and above	13(21.3%)	80(28.5 %)	1.00	1.00		
Maternal occupation	Employer	3(4.8%)	43(15.1%)	3.4(0.9-12.0)	1.00		
	Farmer	12(19.3%)	50(17.6%)	3.5(1.05-11.9)	5.46	.90	33.67
	Merchant	47(75.8%)	191(67.3%)	1.00	5.52	1.004	30.33
Household wealth	1st quintile	6(9.7%)	45(15.8%)	0.4(0.1-1.03)	2.57	.32	20.72
	2nd quintile	17(27.4%)	104(36.6 %)	0.5(0.20.9	3.33	.55	20.22
	3rd quintile	2(3.2%)	23(8.1%)	0.3(0.05-1.2)	1.26	.15	10.74
	4th quintile	14(22.6 %)	45(15.8%)	0.9(0.4-1.9)	1.58	.54	4.66
	5th quintile	23(37.1%)	67(23.6%)	1.00	1.00		
Residence	Rural	32(54.2%)	81(28.5%)	2.8(1.6-5.0)	1.39	.35	5.63
	Urban	27(45.8%)	193(67.9%)	1.00	1.00		
Child age group	6-24month	53(85.5%)	200(70.4%)	2.5(1.1-5.2)	2.5	1.04	6.1
	>24 month	9(14.5%)	84(29.6%)	1.00	1.00		
Birth order	First order	17(27.4%)	107(37.7%)	1.00	1.00		
	Second order	15(24.2%)	107(37.7%)	0.8(0.4-1.9)	.89	.36	2.19
	Third order	12(19.4%)	40(14.1%)	1.9(0.8-4.3)	1.144	.39	3.29
	>= Fourth order	18(29.0%)	30(10.6%)	3.8-1.7-8.2)	1.845	.59	5.75
Decision maker on own and child health care	Mother only or jointly with husband	28(45.2%)	188(66.2%)	1.00	1.00		
	Husband only	34(54.8%)	96(33.8%)	2(1.1-3.7)	0.9	0.4	2.1
Decision maker on both small and large household	Mother only or jointly with husband	24(38.7%)	173(60.9%)	1.00	1.00		
	Husband only	38(61.3%)	111(39.1%)	2.5(1.4-4.3)	1.6	0.8-	3.4
Decision maker on mobility to relatives, friends or health institution, market	Mother only or jointly with husband	16(25.8%)	116(40.8%)	1.00	1.00		
	Husband only	46(74.2%)	168(59.2%)	2.3(1.4-4.2)	1.08	0.5	2.4
Justification for wife beating	Unjustified	18(29.0%)	137(48.2%)	1.00		1.00	
	Justified	44(71.0%)	147(51.8%)	2.3(1.3-4.1)	1.2	0.5	2.6
Overall maternal empowerment status	Empowered	9(14.8%)	89(31.6%)	1.00	1.00		
	Partially empowered	26(42.6%)	135(47.9%)	1.9(0.9-4.3)	.56	1.32	.52
	Disempowered	27(44.3%)	60(21.3%)	4.5(2-10)	.33	.581.7	
Food security status	Food secured	16(26.3%)	129(45.7%)	100	1.00		
	Mildly insecured	9(14.8%)	55(19.5%)	1.6(0.7-3.9)	1.50	.53	4.28
	Moderately insecured	14(23%)	52(18.4%)	2.3(1.04-5.24)	2.16	.84	5.57
	Severely insecured	22(36%)	46(16.3%)	4.8(2.3-10.08)	2.79	1.09	7.16

8. Discussion

By using unmatched case-control study design, this study assessed the association of household maternal empowerment and food security status with undernutrition among children of aged 6-36 month. To its own importance, this study tried to explore the linkage between maternal empowerment and food security status with the specific variants of undernutrition called stunting, wasting and underweight. Generally the study indicated that both maternal empowerment and food security status had significant association with various form of protein energy malnutrition after other confounding factors had been taken into account.

Children who had mothers who couldn‘t decide on their own and child health care lonely or jointly with their husband had more risk of undernutrition compared to the other children. Especially, the risk of stunting and underweight were higher among children of mother who couldn‘t decide on their own and child. This difference can be best explained by the fact that mothers who have no the autonomy to decide on their own or child health care have the less likely to make a timely decision to treat their sick child after discovering an illness; to make use of health services and follow through with treatment recommendations; to have the child immunized; to obtain and prepare a special food for a child; and feed it to the child at an appropriate frequency and with the degree of patience required. She may also have less likely to make timely decision on use of health services for her own care during illness, for ongoing gynecological care, and for prenatal and birthing care (23). This finding was in line with that of studies done in Ethiopia and Tanzania (29 and 57).

Maternal participation in decision making process related to household expenditure had showed significant association with under nutrition. Stunting and underweight were strongly associated with lack of opportunity to decide on household resource allocation/expenditure. This may be best explained by; mothers who had the autonomy to decide on household resources allocation/expenditure devoted a greater proportion of resources to child-centered expenditures. It may also due to maternal control over financial resources be able to effectively change the composition of household purchases. Additional explanation for rural mother may be if rural women have control over assets, they tend to favor the production of food crops that ensure food security for the family in contrast to Men who more frequently show a preference for cash crops

sold on markets (21).The finding was in line with that of studies done in North West Ethiopia, South Africa, Bangladesh and India (25, 31, 32, and 33). But, it was inconsistent with studies done in Bangladesh and Tanzania that describes maternal participation in decision making process of household resources allocation /expenditure didn‘t showed statistical association with PEM in that particular set up (29 and 34). This difference may be due to the difference in measurement tool or context

The risk of undernutrition had shown significant difference among children of mothers who had freedom of mobility and not. Compared to children of mother who had freedom of mobility, children of mother who had no freedom of mobility had 3.5 times more likely to develop stunting. This may be due to children of mother who had no freedom of mobility have less likely to utilize preventive and curative health care service timely, less likely to assure the household food security through different marketing and agricultural activity. This finding was consistent with study done in India (33).

Justification for wife beating which was considered as another indicator of empowerment didn‘t show a valid statistical significant association with any types of undernutrition. This may be due to; the very subjective nature of the question that measured the attitude toward wife beating which may enforces even the disempowered mother not to justify wife beating. Hence, information bias secondary to reporting halfhearted information may be the best explanation. Though justification for wife beating lost its statistical significance in this study, its relative importance shouldn‘t be under estimated. Given the contextual setting, it is possible that this factor does not enhance the nutritional status of children.

The overall empowerment status of the mother found to be the first in its kind in affecting the risk of undernutrition. Among study children maternal disempowerment were strongly associated with stunting and underweight. This can be best explained by the more control a woman has over her own time, household resource and mobility, the more likely; to make a timely decision to treat her sick child after discovering an illness, to make use of health services and follow through with treatment recommendations, to have the child immunized, to obtain and prepare a special food for her child, and feed it with an appropriate frequency, secure household food security

through engaging different productive work activity. She may also be more likely to make use of health services for her own care during illness, for ongoing gynecological care, and for prenatal and birthing care. Empowerment status didn‘t associated with child wasting .this may be due to the fact that empowerment is process and there may not be total disempowerment for certain period of time up to causing as such acute malnutrition . a disempowered mother today tomorrow will be empowered so this fluctuation in empowerment status more likely to cause chronic malnutrition tan acute malnutrition.

Looking at the detail of the linkage between household food security status and, children of severely food insecured household had more chance to develop stunting, underweight and wasting compared to children living in food secured household. The most likely explanation for the association may be, in households experiencing severe food insecurity, not all members have access to enough food, and they may have reduced food intakes, consume poor-quality food, or have disrupted eating patterns and go to bed hungry and sleep hungry which ultimately can lead to acute malnutrition . Compared to study done in different part of the world this finding was very consistent with studies in Nepal, East-Central Uganda, and Colombia (32, 38-40, 41 and 42-44). However, the finding is not in line with those of similar studies done in east rural Ethiopia and Nepal which found that food insecurity had no significant association with undernutrition (30, 45). This inconsistency may be due to the copying mechanism of the food insecured household which forces mother to reduce their own intakes to secure their infants and small children. The difference may also be explained by the high prevalence of food secured household and its insufficiency to secure the nutritional wellbeing of the children. Study done in slum area of South Africa also showed inconsistent result. This inconsistency may be due to the difference in measurement tools, use of convenient sampling technique which is a potential source of selection bias, and also may be due the copying mechanism of the setup.

From all socio-demographic variables wealth index, maternal occupation and residence had shown significant association with undernutrition. Study Children lived in rural area was more likely to stunt and underweight compared to children of urban area. The most likely unsuitable climate, unimproved sanitation and non utilization of different curative and preventive health service in rural area may be the best explanation for the difference. Children from household

with low wealth quintile had more chance to be under weight. Children who had merchant mother had more chance of wasting compared to children of employed mother. The most likely explanation may be the decrease contact times with their mother my compromised their mother care. Maternal educational status had no significant association with undernutrition this can be attributable to the fact that the majority of mother had primary and above level of education and it‘s in sufficiency to prevent undernutrition in the area. The finding was consistent with studies done in different part of Ethiopia and Nepal (30, 45, 53, 56, and 50). But it was inconsistent with studies in different part of the world including Ethiopia, Bangladesh, and Iraq, (31, 54, 57 and 64). The variation in this finding may be due to the context. Age of the mother didn‘t show an association with our variable of interest. This can be attributable to difficulty of getting accurate age of mother which can cause to non differential exposure misclassification bias that nullifies the actual effect.

In this study all child characteristics were found to be non influencing factor for undernutrition except their age group. The likelihood of wasting among children aged less than 24 month was 2.5 times higher than children age d greater than 24 month in this study twinning had no association with undernutrition; this may be explained by the fact that only 2.6 percent of cases and 0.4 percent of controls were twin. Since this sample was insufficient to detect the existing exposure difference between case and control, the result come up with its insignificant association with undernutrition. Biological characteristic like the sex and age of the child had no significant association with undernutrition in the study area.

9. Strength and limitation of the study

This study had some strength. Because the finding of this study was based a prospective case control study, it could give a more strong evidence on causation compared to cross-sectional and other descriptive study. Besides, to identify the existing difference, study populations were selected by using probability sampling technique. To minimize the selection bias, clear case definitions, inclusion and exclusion criteria and standard measurement instruments were used. For minimizing information bias, the questionnaire was prepared in the form of closed ended question; intensive training, focused on enhancing heartfelt response from respondent, was given for the data collectors and supervisor; pretest was done for assuring applicability of the questionnaire in the study area, throughout period of data collection the data collectors were blind up on their participant outcome and exposure status and also the respondents too. For assuring whether the data collector follow the activity in a protocol, strict supervision was there; this may also further minimizes the information bias.

This study may have some limitations. Since it is a case control study it is difficult to establish temporal relationship. Besides, Household maternal empowerment had no standard measurement and its ascertainment was based on subjective response of the participants, this difficulty may introduced exposure misclassification bias. Even if, data associated with food security was based on standard measurement tool it was based on subjective response and one month recall period these may also cause reporting and recall bias respectively and eventually differential misclassification bias. Even if the investigator tried to make the data collector to be blind upon outcome and exposure status of the study participants, their previous knowledge up on the issue may mask the advantage of blinding and may cause another information bias. Since the study employed the anthropometric measurement, error might be there. This study used a little beat different exclusion criteria for both case and control this may cause selection bias ultimately external validity of the finding. In addition, the data collection area was confined to Butajira Hospital and Health Center and hence, generalizablity of the finding to children of Gurage zone is under question mark.

10. Conclusion

Maternal disempowerment and severe food insecurity were independently associated with undernutrition among 6-36 month old children who visited to Butajira Hospital and Health center of Gurage zone. Besides, living in rural residence, having low wealth status , having merchant mother and being in age group less than or equal to 24month were found to be factor influencing the nutritional status of children.

11. Recommendations

This study suggested that there is a possibility of intervention to undernutrition. to prevent undernutrition in the area , local policy maker ,health programmer and nongovernmental organization in this thematic area should enhance the nutritional status children through ;Enhancing the household food security status ;promoting mother to decide lonely or jointly with their husband on issue that affects their own self or child health ,household resource allocation /expenditure and freedom of mobility ,improving the wealth status of the household. The risk of wasting is high in children 6-24 month so to prevent this morbidity emphasis should be given for this age group. Given the above recommendations, this is an institutional-based study therefore further community based studies are also recommended to further strengthen the finding and recommendations.

12. References

1. Bhatia P. Measuring and Interpreting Malnutrition and Mortality. Rome: World food program, Nutrition Service 2005.
2. Solomon B. Assessment and analysis of macro and cross-cutting issues contributing to malnutrition. Washington, DC, USA: International Food Policy Research Institute, 2005.
3. http://whqlibdoc.who.int/monograph/WHO_MONO_62_%28chp2%29.pdf.
4. National nutrition programme June 2013-june 2015: 2014, Addis Ababa.
5. Mercedes de Onis DB, Monika. Levels & Trends in Child Malnutrition. Geneva World Health Organization and UNICEF, 2012.
6. Blössner M, de Onis, Mercedes. Quantifying the health impact of malnutrition at national and local levels. Geneva: World Health Organization, 2005.
7. Robert E, Cesar G, Susan P etal. Maternal and child under nutrition and overweight in low income and middle-income countries. Journal of Lancet .2013; 382(9890): 427–451.
8. The 2007 housing and population census of Ethiopia. Addis Ababa, Ethiopia Central Statistical Agency 2007.
9. Ethiopia: situation analysis for Transform Nutrition: 2013.
10. Ethiopia Demographic and Health Survey 2011. Addis Ababa, Ethiopia: Central Statistical Agency, 2012.
11. Girmay M. Prevalence and predictors of under nutrition among infants aged six and twelve months in Butajira, Ethiopia: The P-MaMiE Birth Cohort. BMC Public Health. 2010; 10:27.
12. Eticha K. Prevalence and Determinants of Child Malnutrition [partial fulfillment of the requirements of the degree of Masters of Public Health]: Addis Ababa University; 2007
13. Haroon S, Tim De M, Michel L. Garenne etal. What_s new? Investigating risk factors for severe childhood malnutrition in a high HIV prevalence South African setting. Scand Journal of Public Health Supply. 2010; 69:96-106.
14. Benson T. Framework document for a National Nutrition Strategy for Ethiopia. International Food Policy Research Institute. Addis Ababa.2005
15. Sisay M. World Vision programme for severe acute malnutrition in SNNPR. 2014.

16. WHO/UNICEF Joint Monitoring Programmed (JMP) for Water Supply and Sanitation.2008
17. Stephenson. Burden of Infection on Growth Failure. Journal of Nutrition.1999; 129 (2): 534–38.
18. Brown, K. Nutrition and Infection, Prologue and Progress since 1968—Diarrhea and Malnutrition. Journal of Nutrition. 2003; 133 (1): 328–32.
19. Anju, Sidney R, Carol B. Measuring Women‗s Empowerment as a Variable in International Development. Research and training institute. 2002; 1(1):17-26.
20. Agnes R, Quisumbing S, Ruth S etal. Empowering women to achieve food security. Washington, DC: international food policy research institute, 2001.
21. FAO, IFAD, and ILO Gender Dimensions of Agricultural and Rural Employment: Differentiated Pathways out of Poverty. Rome: FAO, IFAD, and ILO 2010.
22. Asian Development Bank. Gender equality and food security—women‗s empowerment as a tool against hunger Mandaluyong City, Philippines: Asian Development Bank, 2013.
23. Smith, Ramakrishna U, Ndiaye A etal. The Importance of Women‗s Status for Child Nutrition in Developing Countries. Washington, DC: IFPRI 2003.
24. Sethuraman K. The Role of Women‗s Empowerment and Domestic Violence in Child Growth and Under nutrition in a Tribal and Rural Community International Center for Research on Women. 2008.
25. Schmidt E. The Effect of Women‗s Intrahousehold Bargaining Power on Child Health Outcomes in Bangladesh: Colgate University; 2012.
26. Bhagowalia P Menon P Quisumbing R. What Dimensions of Women‗s Empowerment Matter Most for Child Nutrition? The International food policy research institute, 2012.
27. Kamiya Y. Socioeconomic Determinants of Nutritional Status of Children in Lao PDR: Effects of Household and Community Factors. Journal of Health and Population Nutrition.2011; 29(4):339-34.
28. Dereje N. determinants of severe acute malnutrition among under five children in Shashogo woreda, southern Ethiopia: community based a matched case control study. International Journal of Research 2014; 1(6):2348-6848.
29. Ross-S, Hannah M. Maternal Autonomy as a Protective Factor in Child Nutritional Outcome in Tanzania. Atlanta, Georgia: Georgia State University; 2010.

30. Gudina E, Yemane B and Alemayehu W. Predictors of acute undernutrition among children aged 6 to 36 months in east rural Ethiopia: a community based nested case - control study BMC Pediatrics. 2014; 14:91.
31. Bantamen G. Assessment of Factors Associated with Malnutrition among under Five Years Age Children at Michael Worde, Northwest Ethiopia: A Case Control Study. Journal of Nutrition and Food Science. 2014; 4:256.
32. A de Villiers, M .Senekal. Determinants of growth failure in 12-24-month-old children in a high-density urban slum community in East London, South Africa European Journal of Clinical Nutrition 2002; 56(12):1231-41.
33. Mona S. Paula Glenda A etal. Maternal autonomy is inversely related to child stunting in Andhra Pradesh, India. Marten Child Nut. 2005; 5(1): 64-74
34. Rushdie R. Intrahousehold Resource Allocation in Egypt: Does Women‗s Empowerment Lead to Greater Investments in Children? Economic Research Forum; Cairo 2004.
35. Priya B, Agnes R, Vidhya S etal. Unpacking the Links between Women's Empowerment and Child Nutrition: Evidence Using Nationally Representative Data from Bangladesh Independent Consultant, New Delhi2010.
36. Jennifer A, Bilinsky P. Household Food Insecurity Access Scale (HFIAS) for Measurement of Household Food Access Indicator Guide (v. 3). Washington, D.C: 2007.
37. Akoto O, Pooja P, David S etal. Household food insecurity and nutritional status of children aged 6 to 23 months in Kailali District of Nepal. United Nations University Food and Nutrition Bulletin. 2010; 31(4).
38. Saaka M, Osman M. Does Household Food Insecurity Affect the Nutritional Status of Preschool Children Aged 6–36 Months. International Journal of Population Research. 2013.
39. Kathmandu. Household food insecurity is highly prevalent and predicts stunting among preschool children and anemia among their mothers, in Baitadi district of Nepal. Nepal: 2010.
40. Leonardo S. Relationship between food insecurity and nutritional status of Brazilian children under the age of five. Rev Bras Epidemiol. 2013; 16(4):984-86.

41. Francis Lwanga RKW, Joseph KB Matovu etal. Food Security and Nutritional Status of Children Residing in Sugarcane Growing Communities of East-Central Uganda: A Crosssectional Study. Journal of Food Security. 2015; 3(2): 34-39
42. Ariana P, Maureen M. Black, Carol B etal. Food Insecurity and Risk of Poor Health among US-Born Children of Immigrants. American Journal of Public Health 2009; 99(3):556–562.
43. Ihab Ali, Rohana Jalil, Wan M etal. Association between household food insecurity and nutritional outcomes among children in Northeastern of Peninsular Malaysia. Journal of Nutrition Research and Practice. 2014; 8(3):304-11.
44. Michelle Hackett HM-Q, 1 and Martha Cecilia Álvarez 2. Household food insecurity associated with stunting and underweight among preschool children in Antioquia, Colombia.Pan America Journal of Public Health 2009; 25(6): 506–10.
45. Paudel, Pradhan B, Wagle R, etal. Risk Factors for Stunting Among Children: A Community Based Case Control Study in Nepal. Kathmandu University Medical Journal. 2012; 39 (3):18- 24
46. World Health Report 2007. A Safer Future: Global Public Health Security in the21st Century. Geneva: WHO, 2007.
47. World Bank report 2007.Repositioning Nutrition as Central to Development: A Strategy for Large-Scale Action. Washington, DC: World Bank, 2006.
48. Prüss Üstün and C. Corvalán. Preventing Disease through Healthy Environments: Towards an Estimate of the Environmental Burden of Disease. Geneva: World Health Organization, 2006.
49. International Bank for Reconstruction and Development report 2008. Environmental health and child survival: epidemiology, economics, experiences. Washington, DC: World Bank, 2008.
50. Mandefro A, Mohammed T and Lamessa D. Prevalence of undernutrition and associated factors among children aged between six to fifty nine months in Bule Hora district, South Ethiopia. Journal of BioMedCentral Public Health. 2015; 15:14
51. Olagunju F, Fakayode S, Sola-Ojo F. Prevalence and Determinants of Malnutrition among Under-five Children of Farming Households in Kwara State, Nigeria. Journal of Agricultural Science. 2011; 3(3):173

52. WHO Collaborative Study Team on the Role of Breastfeeding on the Prevention of Infant Mortality. Effect of Breastfeeding on Infant and Child Mortality Due to Infectious Diseases in Less Developed Countries: A Pooled Analysis Lancet. 2000
53. Solomon A, Zemene T. Risk factors for severe acute malnutrition in children under the age of five: A case-control study. Ethiopian Journal of Health and Development. 2008; 22(1):21-5.
54. Aklima J Shelby Y, Ahmad M etal. Prevalence and Determinants of Chronic Malnutrition among Preschool Children: A Cross-sectional Study in Dhaka City, Bangladesh. Journal of Health Population Nutrition. 2011; 29(5):494-499.
55. Mandefro A, Mohammed T and Lamessa D. Prevalence of undernutrition and associated factors among children aged between six to fifty nine months in Bule Hora district, South Ethiopia: Journal of BioMedCentral Public Health. 2015; 15:41
56. Teshale F, Sahilu A and Lamessa Dube. Factors associated with stunting among children of age 24 to 59 months in Meskan district, Gurage Zone, South Ethiopia a case-control study. Journal of BioMedCentral Public Health. 2014; 14:800.
57. Solomon Demissie, Amare Worku. Magnitude and factors associated with malnutrition in children 6-59 months of age in pastoral community of Dollo Ado district, Somali region, Ethiopia. Science Journal of Public Health. 2013 1(4):175-83.
58. Hong R, Banta E and Betancourt J .Relationship between household wealth inequality and chronic childhood under-nutrition. International Journal for Equity in Health 2006; 5:15.
59. Kanjilal B, Mazumdar G, Mukherjee M etal. Nutritional status of children in India: Household socio-economic condition as the contextual determinant. International Journal for Equity in Health. 2010; 9:19
60. Masiye F, Chama C, Chitah B. Determinants of Child Nutritional Status in Zambia: An Analysis of a National Survey. University of Zambia 2006.
61. Jejeebhoy S. Women‗s autonomy in rural India: Its dimensions, determinants and influence in the context of India: Women‗s empowerment and demographic processes. New York: Oxford University Press. 2000.
62. Gender Inequality and Women‗s Empowerment; In-depth Analysis of the Ethiopian Demographic and Health Survey 2005. Ethiopian Society of Population Studies. 2008.
63. UNICEF. «Strategy for Improved Nutrition of Children and Women in Developing countries». A Policy Review. New York. 1990.
64. Elham K, Kavosi Z, Aliasghar N, etal. Prevalence and determinants of under-nutrition among children under six: a cross-sectional survey in Fars province, Iran. International Journal of Health Policy and Development. 2014; 3(2):71-6.

13. Annex

14. **Consent form**

ADDIS ABABA UNIVERSITY **ID: _______**

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Informed consent form (English version) to do an interview on determinants factor of protein energy malnutrition among children aged 6-36 month in Gurage zone, SNNPR.

Solid rules that should be followed by interviewer to select eligible study participant before reading the information sheet and asking verbal consent form.

Rule 1: Mother **must be** married i.e. not widowed, divorce, single
Rule 2: Care giver **must be** the actual mother of the child and can communicate verbally
Rule 3: Age group of the child **must be** within 6-36 month
Rule 4: Child and mother **must** lives for six month in Gurage zone
Rule 5: Control **must be** Free from TB, HIV, and persistent diarrhea\, sever burn, coma

N.B. IF the visited mother and child don't full fill all the aforementioned rules please stop here the interview and wait the next participant. Give ID number only for those who full fill all the

I: Information sheet
Greeting: Good morning /good afternoon MAM!
My name is ___________________________ address_____________
I am working as a data collector in study conducted by **Andamlak Dendir,** who is a postgraduate student of Addis Ababa University, college of health science, school of public health The objective of the study is to assess factor associated with malnutrition with special emphasis on maternal empowerment and food insecurity in the Butajira hospital and health center. The reason for why the researcher focused on this research area is, there are different governmental and nongovernmental organizations that run on the promotion of childhood nutrition but child hood malnutrition is still recognized as a deep rooted public health problem across the country and in this set up too. Now you get the chance to participate in this study.

Now the information that will get from you is very crucial to made valid conclusion on determinant of malnutrition. I would very much appreciate your participation. If you are ok to participate, the following activity will be done: 1) yours and your child height, weight, MUAC will be measured, and 2) there will be 10-15 minute interview that focused on child caring behavior, environmental condition, socio-demographic characteristic, food insecurity and maternal empowerment.

Participation will not have any harm and a direct financial or other benefit for you but your information is invaluable to achieve the objective of the research. Whatever information you provide it will be kept confidentially and to assure that we will use code number , name is will not be written and in addition the document will not be shared with anyone other except people participating in this study.

Participation is purely voluntary, and if I come up with any question that you don't want to answer, just let me know it and I will go on to the next question. Besides that, you will have 100 % freedom to stop the interview at any time. I hope you will participate in this study since your information is very crucial.

At this time, do you want to ask me anything about this research?

May I begin the interview now? If she said ‗yes' proceed the next interview ,if said ‗no' ,say thank you and go to the next participant

Signature of interviewer: ________________________ Date-: ____________________

Address of the principal investigator

Phone number: 0912242332

Gmail: andamlakdendir@gmail.com

Address of the interviewer

Phone number: __________

Email: ____________

Address of research ethics committee

Phone number: _______________

email: --------------------------

P.O. Box ____________

II: Verbal informed consent form

I briefly informed and clearly understood the objectives, the associated risk and benefit of the will be conducted by Andamlak Dendir. Since it doesn‘t affect my personnel life in any way, I here verbally approve my consent to voluntarily participate in the study as an interviewee.

Name of interviewer ______________________signature_____________________

Address of the principal investigator

Phone number: 0912242332

Email: andamlakdendir@gmail.com

Address of the interviewer

Phone number: ___________

Gmail: ________________

Address of research ethics committee

Phone number: __________

email: ____________

P.O. Box ____________

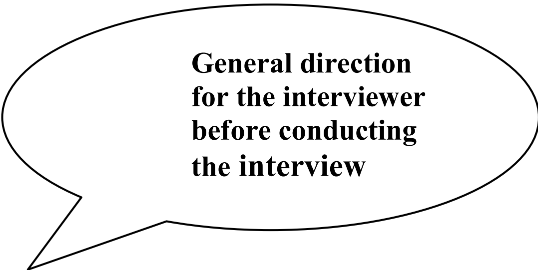
ADDIS ABABA UNIVERSITY **ID: _______**

COLLEGE OF HEALTH SCIENCES

SCHOOLOF PUBLIC HEALTH

14.2 English version questionnaire)

Structured interviewer administered Questionnaire prepared to assess the determinants factor of Protein Energy Malnutrition Emphasis on Maternal Empowerment and Food insecurity among Children Aged 6-36 Month in Gurage Zone, SNNPR.



- ✓ Check whether the questionnaire has nine part and seven page including this page
- ✓ Check the questionnaire contains socio-demographic characteristics, child and mother characteristics, child caring behavior, environmental condition, food insecurity and maternal empowerment and anthropometric measurement.

PARTE I: SOCIO DEMOGRAPHIC CHARACTERISTIC

	Questions	Response options	Code	Skip to
1. 1	Age of the mother _____________			
1.2.	What is your Religion?	1. Orthodox 2. Catholic 3. protestant 4. Muslim 5. Other	|___|	
1.3.	Have you ever attended formal school?	1. Yes 2. No		IF ‗No' Skip to Q1.5

1.4.	What is the highest level of school you attended?	1. primary 2. secondary 3. technical/vocational 4. Higher education	|___|	
1.5.	What is your occupation, that is, what kind of work do you mainly do?	1. Government or private Employer 2. Farmer 3. Merchant 4. Housewife	|___|	
1.6.	Residence	1. Urban 2. Rural	|___|	
1.7.	Did your husband ever attend formal school?	1. Yes 2. No	|___|	IF ‗No' Skip to Q1.9
1.8.	What is the highest level of school he attended?	1. primary 2. secondary 3. technical/vocational/diplo ma 4. higher education	|___|	
1.9.	2. What is your husband occupation?	1. Employer /gov.t/private 2. Farmer 3. Merchant 4. Other (specify) ---------	|___|	
PART II : Household wealth				
2.1.	Electricity?	1. Yes 2. NO	|___|	IF ‗No' Skip to Q2.5
2.2.	An electric mitad?	1. Yes 2. No	|___|	
2.3.	3. A television?	1. Yes	|___|	

		2. No		
2.4.	4. A refrigerator	1. Yes 2. No	|___|	
2.5.	5. A radio?	1. Yes 2. No	|___|	
2.6.	6. Milk cows, oxen or bulls?	1. Yes 2. No	|___|	
2.7.	7. Goats, Sheep poultry?	1. Yes 2. No	|___|	
2.8.	8. Horses, donkeys, or mules?	1. Yes 2. No	|___|	
2.9.	automobile like car ,Bajaj ,truck motor cycle	3.	|___|	
PART III: Child characteristic				
	What name is given to your child? __________		|___|	
	How old is she /he now in month___________			
	What is the sex of your child? ____________	1. male 2. female	|___|	
	Is he / she the first, second, the third or the last child of you?	1. The first 2. The second 3. The third 4. Other specify___	|___|	
	Is she/ he twin or not?	1. Yes 2. No	|___|	
PART IV: Anthropometric assessment for child				
4.1.	Does he /she have Bilateral pitting leg Edema	1. Yes 2. No	|___|	
4.2.	Height of the child in cm ______			
4.3.	Does the child measured in line down or standing up position?	1. Is the Lying down position?	|___|	
4.4.	Weight in Kg if he or she have no edema ___			

	PART V: ANTHROPOMETRIC ASSESSMENT FOR MOTHER				
5.5.	Height of the mother in cm _____				
5.6.	Weight in Kg ______				
5.7.	MUAC in cm if she is pregnant______				
5.8.	BMI--------(AFTER DATA COLLECTION)				
6.6.					
6.2.					
Part VII: Maternal empowerment					
7.1.	Who usually makes decisions about health care for yourself and your child	1. you 2. husband/partner only 3. Jointly by your husband and you	|___|		
7.2.	Who usually makes decisions about household expenditure during holiday, buying land and house hold amenities and other expenditure like for food , drug purchasing	1. you 2. your husband/partner only 3. Jointly by your husband	|___|		
7.3.	As we know that some husbands are not much satisfactory to let their wife to go alone to health facility, their family or relatives while they are not around there or not. What about your husband? He is Ok! Or not Ok!	1. He is Ok! 2. He is Not Ok!	|___|		
7.4.	Who made decision on if you want to go your family or relative?	1. you 2. your husband/partner only 3. Jointly by you 4. Your husband and you	|___|		

7.5.	In your opinion, in which situation wife biting is necessary?	1. If she goes out without telling him? 2. If she neglects the children? 3. If she argues with him? 4. If she refuses to have sex with him? 5. If she burns the food?	|___|		
	VIII: Environmental factor				
8.1.	What is the main source of water used by your household for cooking, drinking and hand washing?	1. pipe 2. rain 3. river 4. protected spring 5. protected well 6. unprotected well 7. un protected spring	|___|		
8.2.	Does the water that you get from your main source of water is enough for daily need?	1. Yes 2. No	|___|		
8.3.	How many minute it take to fetch water from main source?	1. <15 minute 2. >15 minute	|___|		
8.4.	By approximation, how far is your main source water from your house in kilometer?	1. <=1km 2. >1km	|___|		
8.5.					
8.6.	What type of toilet do you mainly use?	1. A toilet connected to a public sewer or septic tank system 2. Pour-flush toilet	|___|		

		3. Hygienic pit toilet 4. Ventilated improved pit (VIP) toilet 5. Public or shared toilet 6. open pit toilet 7. Bucket toilet		
8.9.	In what material your household floor made of?	1. Cement 2. Mud		

Part 9: Household Food Insecurity Access Scale (HFIAS) Measurement Tool

S. NO	Question	Response options	Code	Skip
9.1.	In the past four weeks, did you worry that your HH would not have enough food?	0 = No 1=Yes	|___|	If ‗No' skip to Q9.2
9.1.a	How often did this happen?	1 = Rarely (once or twice in the last 4 weeks) 2 = Sometimes (3-10 times) 3 = Often (more than ten times)	|___|	
9.2.	In the past four weeks, were you or any HH member not able to eat the kinds of foods you preferred because of a lack of resources?	0 = No 1=Yes	|___|	If ‗No' skip to Q9.3
9.2.a	How often did this happen?	1 = Rarely (once or twice) 2 = Sometimes (3-10 times) 3 = Often (more than ten times)	|___|	
9.3	In the past four weeks, did you or any HH member have to eat a limited variety of foods due to a lack of resources?	0 = No 1 = Yes	|___|	If ‗No' skip to Q9.4
9.3.a	How often did this happen?	1 = Rarely (once or twice) 2 = Sometimes (3-10 times)	|___|	

		3 = Often (more than ten times		
9.4.	In the past four weeks, did you or any HH 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 1 = Yes	|___|	If ‗No‘ skip to Q9.5
9.4.a	How often did this happen?	1 = Rarely (once or twice) 2 = Sometimes (3-10 times) 3 = Often (more than ten times)	|___|	
9.5.	In the past four weeks, did you or any HH member have to eat a smaller meal than you felt you needed because there was not enough food?	0 = No 1 = Yes	|___|	If ‗No‘ skip to Q9.6
9.5.a	How often did this happen?	1 = Rarely (once or twice) 2 = Sometimes (3-10 times) 3 = Often (more than ten times)	|___|	
9.6.	In the past four weeks, did you or any other HH member have to eat fewer meals in a day because there was not enough food?	0 = No 1 = Yes	|___|	If ‗No‘ skip to Q9.7
9.6.a	How often did this happen?	1 = Rarely (once or twice) 2 = Sometimes (3-10 times) 3 = Often (more than ten times)	|___|	
9.7.	In the past four weeks, was there ever no food to eat of any kind in your HH because of lack of resources to get food?	0 = No 1 = Yes	|___|	If ‗No‘ skip to Q9.8
9.7.a	How often did this happen?	1 = Rarely (once or twice) 2 = Sometimes (3-10 times) 3 = Often (more than ten	|___|	

		times)		
9.8.	In the past four weeks, did you or any HH member go to sleep at night hungry because there was not enough food?	0 = No 1 = Yes	|___|	If ‗No' skip to Q9.9
2.8.a	How often did this happen?	1 = Rarely (once or twice) 2 = Sometimes (3-10 times) 3 = Often (more than ten times)	|___|	
9.9.	In the past four weeks, did you or any HH member go a whole day and night without eating anything because there was not enough food?	0 = No 1 = Yes	|___|	If ‗No' skip Q9.9a
9.9.a	How often did this happen?	1 = Rarely (once or twice) 2 = Sometimes (3-10 times) 3 = Often (more than ten times)	|___|	

15. Amharic version questionnaire

አዲስ አበባ ዩኒቨርሲ ተራ ቁጥር : ------

ጤና ሳይንስ ኮሌጅ

የህብረተሰብ ጤና ትምህርት ቤት

በምግብ እጥረት ዙሪያ ላይ ጥናት ለማድረግ ሲባል ተሳታፊዎች በጥናቱ ዉስጥ ከመሰተፋቸው በፊት በፍቃደኝነት እንዲሳተፉ ሲባል የተዘጋጀ የፍቃድ ቅፅ

ለመረጃ ሰብሳቢዎች **፣** ማንኛውም መረጃ ሰብሳቢ ይህ የፍቃደኝነት ጹሁፍ ለተሳታፊዎች ከማንበቡ በፊት ተሳታፊው/ዋ ለጥናቱ ብቁ ነው ወይስ አይደለም ብሎ መለየት ይኖርበታል ፣ ይህን ለመለየት መረጃ ሰብሳቢው የግድ የሚከተሉትን መመልመያ መስፈርቶች መከተል ይኖርበታል፡፡

1. የልጅ እናት የግድ በትዳር ላይ የሆነች መሆን አለባት
2. የልጅ አሳዳጊ የግድ የልጁ ትክክኛ እናት መሆን አለባት
3. የልጁ እድሜ ገደብ በ6-36 ወራት ውስጥ መሆን አለበ/ባት
4. ልጁ ከእናቱ ጋር በጉራጌ ዞን ውስጥ ቢያንስ ለ6 ወር የቆየ መሆን አለበት/ባት
5. ከምግብ እጥረት ነጻ የሆኑ ህጻናት ከቲቢ ፣ ኤች አይ ቪ ፣ ከረጅም ግዜ ተቅማጥ ፣ ከባድ ቃጠሎ ፣ በበሽታ እራሳቸውን የሳቱና ምግብ ለመብላት የሚያስቸግር የተፈጥሮ ጉድለት ሊኖርባቸው አይገባም፡፡

መልዕክት : ህፃኑ ተራ ቁጥር ሊሰጠው የሚችለው ከላይ የተጠቀሱት መስፈርቶች ሁሉንም ካሟላ ብቻ ነው፡፡

ጥናቱ በተመለከተ ለተሳታፊዎች ግንዛቤ ለመስጠት የተዘጋጀ ጹሁፍ

ሰላምታ : ደህና አደርሽ /ደህና ዋልሽ

ስሜ -------------------- እባላለሁ፡፡ **አድራሻዬ**--------------- ነው፡፡ እኔ በአዲስ አበባ ዩኒቨርስቲ ሁለተኛ ድግሪውን እየተከታተለ በሚገኘው ተማሪ እንደምላክ ደንድር በሚሰራው ጥናት ላይ መረጃ ሰብሳቢ ነኝ፡፡ የጥናቱ ዋና አላማ በዚህ ቡታጅራ ሆስፒተልና ጤና ጣቢያ አካባቢ በሚኖሩ ህፃናት ላይ ከሚንፀባረቀው የምግብ እጥረት በሽታ ጋር ተያያዥነት ያላቸው ችግሮች በተለይ የእናቶች የቤት ውስጥ ውሳኔ የመስጠት ሁኔታና የቤት ውስጥ የምግብ ዋስትና ከችግሩ ጋር ያላቸው ትስስርነት ማጥናት ነው፡፡ ጥናት አድራጊው ይህንን ጥናት እንዲያጠና ያነሳሳው ነገር ቢኖር እንደሚታወቀው በሀገራችን ላይ በህጻናት ምግብ ዙሪያ ላይ ብዙ መንግስታዊና መንግስታዊ ያልሆኑ ድርጅቶች አሉ ነገር ግን የምግብ እጥረት በሽታ በእነዚህ ህጻናት ላይ ስር የሰደደ ችግር ሆኖ እየታየ ነው፡፡ ስለዚህ ይህን ችግር ለመቅረፍ ከችግሩ ጋር ተያዥነት ያላችው ጉዳዮች ላይ ጥናት ማድረግ ግድ ነው፡፡ አንቺ ጥናቱ ላይ እንድትሳተፊ እድሉን አግኝተሻል. አሁን ከ አንቺ የምናገኘው መረጃ ከዚህ በሽታ ጋር ትስስርነት ያላቸው ተጓዳኝ ችግሮች ላይ ትክክለኛ ውሳኔ ለመስጠት በጣም አስፈላጊ ስለሆነ በጥናቱ ላይ እንድትሳተፊ እጅግ በጣም እፈልጋለሁ፡፡ ጥናቱ ሲጀምር ሊደረጉ የሚችሉ ተግባሮች ቢኖሩ ያንቺና የልጅሽ ቁመት ፣ክብደት፣የክንድ ጡንቻ መጠን መለካት ነው፡፡ በተጨማሪም ለ15 ደቂቃ የሚቆይ መጠይቅም ይኖረናል፡፡ ተሳትፎው ምንም አይነት ጉዳትም ሆነ በእጅ የሚሰጥ ገንዘብ ወይም ስጦታ አይኖረውም ነገር ግን መረጃሽ አላማችንን ለማሳካት እጅግ በጣም ወሳኝ ሲሆን አንቺ ደግሞ መቶ በመቶ ጥናቱ ላይ ያለመሳተፍ መብት ይኖርሻል፡፡ በተጨማሪም እየተሳተፍሽ እያለ ማንኛውም የማትፈልጊውን ጥያቄ ይገፍብሽ ከቀረብኩኝ አለመመለስ ወይም ከፈለግሽም መጠይቁን በየትኛውም ሰዓት አቋርጠሽ መውጣት ትችያለሽ፡፡ ያው መረጃሽ እጅግ እጅግ አስፈላጊ ስለሆነ በዚህ ጥናት ላይ እንደምትሳተፊ ተስፋ አደርጋለሁ፡፡ ስለጥናቱ በተመለከተ የያለው ነገር ይህ ነው አሁን አንቺ የምትጠይቂኝ ነገር አለ?

መጠይቁን መቀጠል እችላለሁ? /እሺ ካለች ወደሚቀጥለው መጠይቅ ይሂዱ ፈቃደኛ ካልሆነች ደግሞ አመስግነው ወደ ሚቀጥለው ተሳታፊ ይሂዱ፡፡

የቃል ፍቃደኝነት መስጫ ቅጽ

እኔ በ አንዳምላክ ድንድር በሚሰራው ጥናት ላይ ግልጽ የሆነ አጭር መረጃ አግኝቻለሁ፡፡ጥናቱ በእኔ ህይወት ላይ ምንም አይነት ጉዳት ስለማይሰከትልብኝ በጥናቱ ላይ ተሳታፊ ሆኜ መረጃ ለመስጠት ፍቃደኛ ስለመሆኔ በቃሌ አረጋግጣለሁ፡፡

የመረጃ ጠያቂው ስም------------------------ ፊርማ-------

የዋና የጥናት አድራጊው አድራሻ

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የመረጃ ጠያቂው አድራሻ

ስልክ---------------------------------

Email-

የአዲስ አበባ ዩኒቨርስቲ የምርምር ስነ-ምግባር ኮሚቴ አድራሻ

ስልክ---------------------------------

Email-------------------------------------

p.box -----------------------------------

አዲስ አበባ ዩኒቨርስቲ

ጤና ሳይንስ ከሌጅ

የህብረተሰብ ጤና አጠባበቀ ተምህረት ቤት

በ6-36 ወራት ዕድሜ ክልል ውስጥ ሆነው ቡታጅራ ሆስፒታልና ጤና ጣቢያ በሚመጡ ህጻናት ላይ ከምግብ ጥራት ጋር ተያያዥነበት ያላቸው ነገሮች ላይ ጥናት ለማድረግ የተዘጋጀ የቃል መጠይቅ፡፡

መረጃ ሰብሳቢዎች መረጃ ከመሰብሰባቸው በፊት መከተል ያለባቸው መርሆች

1. መጠይቁ ዘጠኝ ክፍሎች እና አስር ገጾች መኖሩን ያረጋግጡ
2. መጠይቁ በማህበራዊ ጉዳዮች ፤በቤት ውስጥ ንብረቶች ፤በምግብ ዋስትና፤ በእናቶች ውሳኔ ሰጪነት ሁኔታ፤የህፃንመለዎች፤በህጻናት አጠባበቅ ላ፣ የህፃናትናየእናቶች የሰውነት ልኬት ፣ የግልና የአካባቢ ጤና በተመለከተ ጥያቄ መያዙን ያረጋግጡ፡፡

ክፍል፣ ማህበራዊ ጉዳዮችን በተመለከተ የተዘጋጀ መጠይቅ

ተ.ቁ	**ጠያቄ**	**አማራጭ መልሶች**	ኮድ	ሚዘለሉ ጥያቄዎች አመልካቸ ረድፍ
1.1. 1	እድሜዎ ስንት ነው ------------		-----	
1.2. 2	የምን ሃይማኖት እምነት ተከታይ ኖት?	1. ኦርቶዶክስ 2. ሙስሊም 3. ፕሮቴስታንት 4. ሌላ ከሆነ ይጠቀስ	|__|	
1.3. 3	ከዚህ በፊት መደበኛ ትምህርት ቤት ተከታትለው ያውቀሉ?	1. አዎን 2. አልውቅም	|__|	(አላውቅም ካሉ ጥያቄ 1.4 ይዝለሉት
1.4.	እሰከ ስንት ትምህርት ደረጃ ነው የተከታተሉት?	1. የመጀመርያ ሳይክል 2. ሁለተኛ ደረጃ ሳይክል 3. ቴክኒክና ሙያ/ዲፕሎማ 4. ከፍተኛ ደረጃ/ዲግሪ እና ከዛ በላይ	|__|	
1.5.	ባብዛኛው ጊዜ የሚሰሩት የስራ አይነት ምንድን ነው?	1. የመንግስት/የግል ድርጅት ቅጥረኛ ግብርና	|__|	

		2. ንግድ 3. የቤት እመቤት 4. ሌላ ከሆነ ይጥቀሱ		
1.6.	በ አብዛኛው ጊዜ የሚኖሩት ከተማ ነው ወይስ ገጠር ነው?	1. ከተማ 2. ገጠር	|__|	
1.7.	ባለቤቶ ከዚህ በፊት መደበኛ ት/ት ተከታትሎ ያውቃል?	1. አዎን 2. አያውቅም	|__|	(አያውቅም ካሉ ጥያቄ 1.8 ይዝለሉት
1.8.	እሰከ ስንት ትምህርት ደረጃ ነው የተከታተለው?	1. የመጀመርያ ሳይክል (1-8 2. ሁለተኛ ደረጃ ሳይክል(9-12) 3. ቴክኒክናሙያ/ዲፕሎማ 4. ከፍተኛ የት/ት ደረጃ/ ድግሪ	|__|	
1.9.	ባለቤቶ በአብዛኛው ጊዜ የሚሰራው የስራ አይነት ምንድን ነው?	1. የመንግስት የግል ድርጅት ቅጥረኛ 2. ግብርና 3. ንግድ 4. ሌላ ከሆነ ይጠቀስ----	|__|	
ክፍል ሁለት ፤ የቤት ውስጥ ንብረት በተመለከተ የተዘጋጀ መጠይቅ እቤቶ ውስጥ፡-				
2.1.	ሙብራት አሎት?	1. አዎን 2. የለም	|__|	መልሰዎ የለም ከሆነ ጥያቄ 2.2፣2.3፣2.4፣ ይዝለሏቸው
2.2.	በኤሌልክትሪክ ምጣድ አሎት?	1. አዎን 2. የለም	|__| |__|	
2.3.	ቴሌቭዥንአሎት?	1. አዎን 2. የለም	|__| |__|	
2.4.	ፍሪጅ አሎት?	1. አዎን 2. የለም	|__| |__|	
2.5.	ሬድዮ አሎት?	1. አዎን 2. የለም	|__|	
2.6.	ተሽከርካሪ ማለትም መኪና፣ባጃጅ፣ሞተር ሳይክል ከመሳሰሉ ተሽከርካሪዎች ቢያንስ አንዳቸው አሎት?	1. አዎን 2. የለም	|__|	

2.7.	የወተት ከብት፤ በሬ፤ ወይፈን ከመሳሰሉት የቤት እንስሳቶቸህ ቢያንስ አንዳቸው አሎት?	1. አዎን 2. የለም	⊔	
2.8.	ፍየል፤ በግ ፤ ዶሮ ከመሳሰሉት ቢያንስ አንዳቸው አሎት?	1. አዎን 2. የለም	⊔	
2.9.	ፈረስ ፤አህያ፤ በቅሎ የመሳሰሉት የጋማ ከብቶች አሎት?	1. አዎን 2. የለም	⊔	
2.10.	የራሶ የሆነ የመኖሪያ ወይም የ እርሻ መሬት አሎት?	3. አዎን 4. የለም	⊔	

ክፍል ሶስት ፡ የህጻን መለያ ባህሪያት በተመለከተ የተዘጋጀ መጠይቅ

ተ.ቁ		**አማራጭ መልሶች**	**ኮድ**	
3.1.	የህፃን ስም---------------			
3.2.	የህፃን እድሜ በወራት-----------			
3.3.	የህፃን ጾታ-----------------	1. ወንድ 2. ሴት	⊔	
3.4.	ይህ ልጅ ስንተኛ ልጅዎ ነው/ናት?	1. የመጀመርያ 2. ሁለተኛ 3. ሶስተኛ 4. አራተኛ ና ከዛ በላይ	⊔	
3.5.	ይህ ልጅዎ መንታ ነው/ናት?	1. አዎ 2. አይደለም	⊔	

ክፍል አራት ፡ የልጅ የሰውነት ልኬትና ምልክት በተመለከተ የተዘጋጀ መጠይቅ

4.1.	የእግር እብጠት (በመረጃ ሰብሳቢዎቸች የሚረጋገጥ)	1. አለ 2. የለም	⊔	
4.2.	የልጁ ቁመት በሳ.ሜትር-----------			
4.3.	የልጅ ክብደት በኪ.ግ (እብጠት ከሌለው ይተግበር)			
4.4.	የልጁ ቁመት የተለካው ተኝቶ ነው ወይስ ቆሞ	1. ተኝቶ 2. ቆሞ	⊔	
ክፈል አምስት የእናት የሰውነት ልኬት በተመለከተ የተዘጋጀ መጠይቅ				
5.1.	የእናት ቁመት በሳንቲ ሜትር--------			
5.2.	የእናት ክብደት በኪሎ ግራም---------			

5.3.	የእናት የክንድ ጡንቻ መጠን --------			

ክፍል ስድስት ፡ ህጻን አጠባበቅ ዙሪያ በተመለከተ የተዘጋጀ መጠይቅ

6.1.	ለስንት ግዜ ያህል ማለትም ለስንት ሰዓት ፣ቀን፣ወራት ድረስ ነው ይህ ልጅ ጡቶን ብቻ ሲጠባ የኖረው/የኖረችው? ----------	1- ከስድሰት ወር በታች 2- ልክ እስከ ስድስት ወር 3- ስድስት ወር ካለፈው በኋላ	⊔	
6.2.	ጡቶን ቢቻ በሚጠባበት/በምትጠባበት ወቀት በቀን ስንቴ ያጠቡት ነበር/ያጠቧት ነበር?	1- ከ ስምንት ጊዜ በታቸ 2- ለስምነት ጊዜ ና ከዛ በላይ	⊔	

ክፈል ሰባት ፡ የእናቶችንየቤት ውስጥ ውሳኔ መስጠትን በተመለከተ የተዘጋጀ መጠይቅ

7.1.	አብዛኛውን ጊዜ ስለልጅዎ ና ስለራስዎ ጤና አጠባበቅ ውሳኔ በተመለከተ ማለትም ልጅዎ ሲታመም ሆነ እርሶዎ ሲታመሙ ሀኪም ቤት ሄደው/ ሆነ እቤት ውስጥ የጤና ክትትል ማድረግ ቢፈለጉ አብዛኛውን ግዜ ውሳኔው የሚወሰነው በ ማነው?	1. በ እራሶ ብቻ 2. ባለቤቶ ቢቻ 3. በረሶና ባለቤቶ ሰምምነት 4. ሌላ ሰው	⊔	
7.2.	በቤት ውጪዎቸ ላይ ማለትም በትናንሽም ሆነ በትላለቅ የቤት ወጪዎች ላይ አብዛኛውን ግዜ ውሳኔ የሚሰጠው በማነው?	5. በ እራሶ ብቻ 6. ባለቤቶ ቢቻ 7. በረሶና ባለቤቶ ሰምምነት 1. ሌላ ሰው	⊔	
7.3.	ብዙ ግዜ አንዳንድ አባወራዎች ባለቤታቸው እነሱ በሌሉበት ወቅት ባለቤታቸው ቤት ለቀው ወደ ዘመዳቸው ወይም ደግሞ ወደ ጤና ተቋም ሲሄዱ ይቆጧቸዋል የ እርሶ ባለቤት እንዴት ነው ማለትም ይቆጣዎቦታለ ወይስ አይቆጡቦትም ?	1. ይቆጣል 2. አይቆጣም	⊔	

7.4.	አሁን ከተጠቀሱ ቦታዎች ማለትም ወደ ጤና ተቋም እና ወደ ዘመዶ ቤት ለመሄድ ቢፈልጉ ማነው አብዛኛውን ግዜ ውሳኔ ሚሰጦት?	1- በ እራሶ ብቻ 2- ባለቤቶ ቢቻ 3- በረሶና ባለቤቶ ሰምምነት 4- ሌላ ሰው	|__|	
7.5.	በእረሶ አስተያየት በምን ግዜ ነው በቤት እመቤቶች ላይ ቁጣ/የቃላት ዝሊፊያ አስፈላጊ መሆን ያለበት?	1. ባለቤትዋን ሳትነግረው ሌላቦታ ከሄደች 2. ልጆቿን ጥላ የምትሄድ ከሆነ 3. ከባለቤቷ ጋር አለስፈጊ ንትርክ /ጭቅጭቅ የምትፈጥር ከሆነ 4. ለለቤቷ ወሲብ የምትከለክል ከሆነ 5. ምግብ ምታባክን ከሆነ 6. ቤትኛው ሰአተ እናት መመታት የለባትም	|__|	

ክፍል ስምንት ፡ የግልና የ አካባቢን ጤና በተመለከተ የተዘጋጀ መጠይቅ

8.1	በ አብዛኛው ግዜ ለመጠጥ ፣ለእጅ መታጠቢያ ፣ለምግብ ዝግጅት የሚጠቅሙት ውሃ ከየትኛው የውሀ ምንጭ ነው የሚቀዱት?	1. ከቧንቧ 2. ከዝናብ 3. ከወንዝ 4. ከተከለለ የምንጭ ውሀ 5. ከተከደነ የጉድጓድ ውሀ 6. ካልተከደነ የጉድጓድ ውሀ 7. ካልተከለለ የምንጭ ውሀ	|__|	
8.2.	ከ ዋናው ውሃ ምንጭ የሚገኙት የውሀ መጠን ለዘወትር ፍጆታዎ በቂ ነው?	1. አዎ 2. አይ	|__|	
8.3.	ከዋናው የውሃ ምንጭ ውሃ ቀድቶ ለመመለስ ከእርሶ ቤት እስከ ስንት ደቂቃ ይፈጇል?		|__|	
8.4.	ዋናው የውሃ ምንጭ ከቤቶ በግምት ስንት ኪሎሜትር ይርቃል?		|__|	

8.6.	በ አብዛኛው ጊዜ የእርሶ ቤተሰብ የሚጠቀምበት መጸዳጃ ቤት አይነት ምን አይነት ነው?	1. ከህዝብ ፈሳሽ ማስወገጃ ጋር የተገናኘ ሽንት ቤት ነው 2. ቆሻሻ መጣያ እና መክደኛ ያለው የጉድጓድ ሽንት ቤት ነው 3. የጋራ / የህዝብ ሽንት ቤት ነው 4. ያልተከደነ የጉድጓድ ሽንት ቤት ነው 5. ቁጥቋቀጦ ስር 6. ሌላ ካለ ይጠቀስ	|__|	
8.8.	የመኖሪያ የቤተዎ መሰረት ከምንድነው የተሰራው	1. ከ ጭቃ ነው 2. ከሲሚንቶ ነው	|__|	

ክፍል ዘጠኝ፡ የቤተሰብ የምግብ ዋስትና ሁኔታ ለመዳሰስ የተዘጋጀ መጠይቅ

ተ.ቁ				
9.1.	ባለፈው አንድ ወር ውስጥ በቤትዎ ውስት የምግብ ዕጥረት እዳያጋጥሞት ተጨንቀው ያወቃሉ?	0-አላውቅም 1-አዎ	|__|	አላውቅም ካሉ ጥያቁ 9.1. a ን ይዝለሉት
9.1.a	መልካም አዎ ከሆነ ይህ ለምን ያህል ግዜ ተከስቷል?	1- አልፎ አልፎ (አንዴ ወይ ሁለቴ) 2- የተወሰነ ግዜ (3-10) 3- ብዙ ግዝ (ከ10 ግዜ በላይ)	|__|	
9.2.	ባለፍው እንድ ወር ውስጥ አረሶ ወይም ሌላ የቤተሰብ አባል በምግብ እጥረት ምክኒያት የሚፈልጉትን ምግብ ሳይመገቡ ቀርተዋል?	0-የለም 1-አዎ	|__|	የለም ካሉ ጥያቁ 9.2.a ን ይዝለሉት
9.2.a	መለስዎ አዎ ከሆነ ይህ ለምን ያህል ጊዜ ተከስቷል?	1- አልፎ አልፎ (አንዴ ወይ ሁለቴ) 2- የተወሰነ ግዜ (3-10) 3- ብዙ ግዝ (ከ10 ግዜ በላይ)	|__|	
9.3.	ባለፈው አንድ ወር ወስጥ እርሶ ወይም ሌላ የቤተሰብ አባል በምግብ አቅርቦት ምክኒያት የሚመገቧቸው የምግብ አይነቶች ቀንሰዋል?	0-አላውቅም 1-አዎ	|__|	አላውቅም የለም ካሉ ጥያቁ 9.3aን ይዝለሉት)
9.3a	መለስዎ አዎ ከሆነ ይህ ለምን ያህል ጊዜ ተከስቷል?	1- አልፎ አልፎ (አንዴ ወይ ሁለቴ) 2- የተወሰነ ግዜ (3-10) 3- ብዙ ግዝ (ከ10 ግዜ በላይ)	|__|	

9.4.	ባለፈው አንድ ወር ውስጥ እርሶ ወይም ሌላ የቤተሰብ አባል በምግ አቅርቦ ምክኒያት የማይፈልጉትን የምግብ አይነት ተመግበዋል?	0-አላውቅም 1-አዎ	|__|	አላውቅም የለም ካሉ ጥያቄ 9.4aን ይዝለሉት)
9.4.a	መለስዎ አዎ ከሆነ ይህ ለምን ያህል ጊዜ ተከስቷል?	1- አልፎ አልፎ (አንዴ ወይ ሁለቴ) 2- የተወሰነ ግዜ (3-10) 3- ብዙ ግዝ (ከ10 ግዜ በላይ)	|__|	
9.5.	ባለፈው አንድ በወር ውስጥ እርስዎ ወይም ሌላ ቤተሰብ አባል በምግብ እጥረት ምክኒያት የሚመገቡትን የምግብ መጠን ቀንሰዋል?	0-አላውቅም 1-አዎ	|__|	አላውቅም የለም ካሉ ጥያቄ 9.5aን ይዝለሉት)
9.5.a	መልሱ አዎ ከሆነይህ ለምንህል ጊዜ ተከስቷል?	1- አልፎ አልፎ (አንዴ ወይ ሁለቴ) 2- የተወሰነ ግዜ (3-10) 3- ብዙ ግዝ (ከ10 ግዜ በላይ)	|__|	
9.6.	ባለፈው አንድ ወር ውስጥ በምግብ እጥረት ምክኒያት እርሶ ወይም ሌላ የቤተሰብ አባል በምግብ እጥረት ምክኒያት በቀን መግብ የሚበሉባችው ግዜያቶች ቀንሰዋል?	0-አላውቅም 1-አዎ	|__|	አላውቅም የለም ካሉ ጥያቄ 9.6aን ይዝለሉት)
9.6.a	መልሱ አዎ ከሆነይህ ለምንህል ጊዜ ተከስቷል?	1- አልፎ አልፎ (አንዴ ወይ ሁለቴ) 2- የተወሰነ ግዜ (3-10) 3- ብዙ ግዝ (ከ10 ግዜ በላይ)	|__|	
9.7.	ባለፈው አንድ ወር ውስጥ በምግብ እጥረት መከኒያት ማንኛውም የሚበላ ምግብ ከቤት ጠፍቶያውቃል?	0-አላውቅም 1-አዎ	|__|	አላውቅም የለም ካሉ ጥያቄ 9.7aን ይዝለሉት)
9.7.a	መልሱ አዎ ከሆነይህ ለምንህል ጊዜ ተከስቷል?	1- አልፎ አልፎ (አንዴ ወይ ሁለቴ) 2- የተወሰነ ግዜ (3-10) 3- ብዙ ግዝ (ከ10 ግዜ በላይ)	|__|	
9.8	ባለፈው አንድ ወር ውስጥ እርሶ ወይም ሌላ የቤተሰብ አባል በምግብ እጥረት ምክኒያት እየተራቡ ምግብ ሳይበሉ ተኝተው ያውቃሉ?	0-አላውቅም 8 1-አዎ	|__|	አላውቅም የለም ካሉ ጥያቄ 9.8aን ይዝለሉት)
9.8.a	መልሱ አዎ ከሆነይህ ለምንህል ጊዜ ተከስቷል?	1- አልፎ አልፎ (አንዴ ወይ ሁለቴ) 2- የተወሰነ ግዜ (3-10) 3- ብዙ ግዝ (ከ10 ግዜ በላይ)	|__|	
9.9	ባለፈው አንድ ወር ውስት ማንኛውም የቤተሰብ አባል በምግብ እጥረት ምክኒያት እየተራቡ ቀንና ለሊት ሙሉ ምግብ ሳይበሉ ቀርተው ያውቃሉ?	0-አላውቅም 1-አዎ	|__|	አላውቅም የለም ካሉ ጥያቄ 9.9aን ይዝለሉት)
9.9.a	መልሱ አዎ ከሆነይህ ለምንህል ጊዜ ተከስቷል?	1- አልፎ አልፎ (አንዴ ወይ ሁለቴ) 2- የተወሰነ ግዜ (3-10)	|__|	

16. Curriculum vitae (CV) of the principal advisor

Name :Wakgari Deressa Amente (BSc, MPH, PhD)

Sex: Male, Date of Birth: 10 November 1969, Nationality: Ethiopian

Address: School of Public Health, Addis Ababa University

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Addis Ababa, Ethiopia

Education

- **PhD** Degree in Public Health, Addis Ababa University (AAU), Ethiopia, 2007.
- **MPH** (Master of Public Health) Degree, Addis Ababa University, Ethiopia, 2000.
- **BSc** Degree in Biology, Addis Ababa University, Ethiopia, 1989.

Recent Academic Ranks

- **December 23, 2011 – present**
- **Associate Professor**, Department of Preventive Medicine, School of Public Health, AAU
- **October 11, 2005 – December 22, 2011**
- **Assistant Professor**, Department of Epidemiology and Biostatistics, School of Public Health, AAU
- **August 2001 – September 2005**
- **Public Health Instructor**, Department of Community Health, Faculty of Medicine, AAU

Recent Academic Appointments

- **February 07, 2013 - present**
- **Dean**, School of Public Health, College of Health Sciences, AAU
- **August 10, 2010 – May 30, 2012**
- **Head,** Department of Epidemiology and Biostatistics, School of Public Health, AAU
- **January 15, 2008 – December 30, 2009**
- **Assistant Dean for Undergraduate Program,** Faculty of Medicine, AAU

Peer Reviewed Publications since 2011

1. **Deressa W**, Seme A, Asefa A, Teshome A, Enqusellassie F. Utilization of PMTCT services and associated factors among pregnant women attending antenatal clinics in Addis Ababa, Ethiopia. *BMC Pregnancy and Childbirth* 2014. Accepted for Publication.

2. **Deressa W**, Yihdego YY, Kebede Z, Batisso E, Tekalegne A. Individual and household factors associated with use of insecticide treated nets in Southern Ethiopia. *Transactions of the Royal Society of Tropical Medicine and Hygiene* 2014 (doi:10.1093/trstmh/tru129).

3. Haji Y, **Deressa W**, Davey G, Fogarty AW. Concerns about covert HIV testing are associated with delayed presentation of suspected malaria in Ethiopian children: a cross-sectional study. *Malaria Journal* 2014, 13:301.

4. Sena L, **Deressa W** and Ali A. Analysis of trend of malaria prevalence in south-west Ethiopia: a retrospective comparative study. *Malaria Journal* 2014, **13**:188.

5. **Deressa W**, Yihdego YY, Kebede Z, Batisso E, Tekalegne A, Dagne GA. Effect of combining mosquito repellent and insecticide treated net on malaria prevalence in Southern Ethiopia: a cluster-randomized trial. *Parasites & Vectors* 2014, **7**:132.

6. Skogmar S, Balcha TT, Jemal ZH, Björk J, **Deressa W**, Schön T, Björkman P. Development of a clinical scoring system for assessment of immunosuppression in patients with tuberculosis and HIV infection without access to CD4 cell testing – results from a cross-sectional study in Ethiopia. *Global Health Action* 2014, **7:** 23105 - http://dx.doi.org/10.3402/gha.v7.23105.

7. Woyessa A, **Deressa W**, Ali A, Lindtjørn B. Ownership and use of long-lasting insecticidal nets for malaria prevention in Butajira area, south-central Ethiopia: complex samples data analysis. *BMC Public Health* 2014, **14**:99.

8. Sena L, **Deressa W** and Ali A. Predictors of long-lasting insecticide-treated bed net ownership and utilization: evidence from community-based cross-sectional comparative study, Southwest Ethiopia. *Malaria Journal* 2013, **12**:406.

9. Woyessa A, **Deressa W**, Ali A and Lindtjørn B. Malaria risk factors in Butajira area, south-central Ethiopia: a multilevel analysis. *Malaria Journal* 2013; **12**:273.

Short CV for Wakgari Deressa Page 2 of 2

10. Woyessa A, **Deressa W**, Ali A and Lindtjørn B. Evaluation of CareStart™ malaria Pf/Pv combo test for *Plasmodium falciparum* and *Plasmodium vivax* malaria diagnosis in Butajira area, south-central Ethiopia. *Malaria Journal* 2013; **12**:218.

11. Etana B, **Deressa W**. Factors associated with complete immunization coverage in children 12-23 months in Ambo Woreda, central Ethiopia. *BMC Public Health* 2012; **12**:566.

12. Jima D, Wondabeku M, Alemu A, Tefera A, Awei N, **Deressa W**, et al. Analysis of malaria surveillance data in Ethiopia: what can be learned from the integrated disease surveillance and response system? *Malaria Journal* 2012; **11**:330.

13. Bekele D, Belyhun Y, Petros B, **Deressa W**. Assessment of the effect of insecticide-treated nets and indoor residual spraying for malaria control in three rural kebeles of Adami Tulu District, South-central Ethiopia. *Malaria Journal* 2012; **11**:127.

14. **Deressa W**, Azazh A. Attitudes of undergraduate medical students of Addis Ababa University towards medical practice and migration, Ethiopia. *BMC Medical Education* 2012; **12**:68.

15. Woyessa A, **Deressa W**, Ali A, Lindtjørn B. Prevalence of malaria infection in Butajira area, south-central Ethiopia. *Malaria Journal* 2012; **11**:84.

16. **Deressa W**, Fentie G, Girma S, Reithinger R. Ownership and use of insecticide-treated nets in Oromia and Amhara Regional States of Ethiopia two years after a nationwide campaign. *Tropical Medicine and International Health* 2011; 16(12):1552-1561.

17. **Deressa W**, Azazh A. Substance use and its predictors among undergraduate medical students of Addis Ababa University in Ethiopia. *BMC Public Health* 2011; 11:660.

Coordination of Research Groups

- Coordinator of a research project entitled "Does insecticide treated net and indoor residual spraying for malaria prevention before and during pregnancy improve birth weight and child growth? A cluster randomized controlled trial in Ethiopia?" (2013-2017). Project Number: 223269/F50. http://www.cismac.org/
- Coordinator of a project entitled "Reduction of the burden of injuries and diseases due to occupational exposures through capacity building in low income countries" (2014-2018). Project Number: 1300646-12.

 Coordinator of a research project entitled "Combining indoor residual spraying and long-lasting insecticidal nets for preventing malaria: Cluster Randomized Trial in Ethiopia" (2012-2016), funded by the Research Council of Norway (Research Project–GLOBVAC), Application Number: ES498076, Project Number: 220554**.**

http://malaria.b.uib.no/maltrials/

 Coordinator of a research project entitled "A pilot study to develop a point of care diagnostic assay for malaria suitable for use in adults". 2013/14

 Coordinator of a research project entitled "Concerns about HIV testing in delaying early presentation and treatment of malaria in Adami Tulu woreda, Ethiopia". 2013/14.

 Coordinator of a multidisciplinary research project "Ethiopian Malaria Prediction System" from 2007-2012 (http://emaps.uib.no).

PhD Students Supervision

On-going:

1. Samson Wakuma (Occupational health)
2. Meaza Gezu (Occupational health)
3. Meselech Asegid (Malaria and pregnancy)
4. Alemayehu Dessalegne (Economic evaluation of malaria prevention interventions)
5. Taye Gari (Malaria epidemiology)
6. Lelisa Sena (Spatio-temporal distribution of malaria)
7. Hunachew Beyene (Epidemiology of diarrheal disease)
8. Abyot Asress (TB and HIV)
9. Wondwosson Teklesellassie (Women's utilization of maternal health services)
10. Admasu Tasew (Spatio-temporal analysis of malaria)
11. Mekonnen Eshete (Genetic and environmental causes of cleft lip and palate)
12. Ashenafi Assefa (Malaria epidemiology)

Completed:

1. Adugna Woyessa (2013): Malaria epidemiology

17. **Curriculum vitae (CV) of the principal investigator**

I: PERSONAL BACKGROUND

Full Name: Andamlak Dendir Egata

Age: 26

Place of birth: wolkite

Marital status: single

Nationality: Ethiopian

Current address: Addis Ababa

Phone number: +251912242332

Email: andamlakdendir@gmail.com

II: EDUCATIONAL BACKGROUND

-preparatory school (1998-1999) in Goro preparatory school

-High school (1996-1997)- Gubre secondary school

-Elementary school -Jato elementary school

Undergraduate: (2000-2003) at Hawassa university

III: WORK EXPERIENCE

I have served to Mizan -Tepi University as assistant lecturer for two years by teaching both basic course like anatomy, physiology and public course like health economics, population and development, disaster prevention and preparedness , communicable disease control.

IV: ACHIEVEMENT AND TRAINING

1. I was certified in HDP which is intended to improve the quality of education in Ethiopia through a licensing programme that will develop the skill and professionalism of teacher educator
2. I also certified in the following trainings
   A. **Pedagogical skill** prepared by department of pedagogical science
   B. **Class room language** prepared by English language improvement center
   C. **Ministry of health integrated management of adolescent illness and ART** training organized in collaboration with Hawassa University College of medicine and Health Science and Jhons Hopkins University /TSHAHI
   D. **Work shop on Ethiopian health care challenge** that was organized and supported by Albert Einstein College of Medicine, NYC, USA, Malaria Consortium Ethiopia and Hawassa Health Science College.

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andamlak dendir
theis declaration