

ADDIS ABABA UNIVERSITY
COLLEGE OF HEALTH SCIENCES
SCHOOL OF ALLIED HEALTH SCIENCES
DEPARTMENT OF NURSING AND MIDWIFERY

ASSESSMENT OF THE PREVALENCE AND FACTORS ASSOCIATED WITH
MALNUTRITION AMONG AGES 6-59 MONTHS OF CHILDREN IN BURAYU
TOWN, OROMIA, ETHIOPIA, 2017.

By: ARARE HORDOFA (B.SC)

A THESIS TO BE SUBMITTED TO ADDIS ABABA UNIVERSITY SCHOOL OF
ALLIED HEALTH SCIENCES DEPARTMENT OF NURSING AND MIDWIFERY
IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE DEGREE OF
MASTER OF PEDIATRIC AND CHILD HEALTH NURSING

JULY, 2017

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LIST OF ACRONYMES/ ABBREVIATIONS

AIDS	Aquired Immune Deficiency Syndrome
AOK	Adjusted Odds Ratio
BMI	Body Mass Index
CDC	Communicable Disease Control
CI	Confidence Interval
COHA	Cost of Hunger Africa
CSA	Central Statistics Agency
DALY	Disability Adjusted Life
FAO	Food and Agricultural Organizations
FFQ	Food Frequency Questioner
GDP	Growth Domestic Product
GPAQ	.Global Physical Activity Questioner
HAZ	Height for Age Z-Score
HIV	Human Immuno Virus
SPSS	Statistical Package for Social Science
UAE	United Arab Emirates
WAZ	Weight for Age Z-Score
WHO	World Health Organization
WHZ	Weight for Height Z-Score
UNICEF	United Nations Children's Fund

ABSTRACT

Introduction: - Malnutrition is a major public health problem among under five children. More than one-third of deaths during the first five years of life are attributed to under nutrition, which are mostly preventable through economic development and public health measures.

World Health Organization estimated that there are 178 million malnourished children across the globe, and at any given moment, 20 million of these are suffering from the most severe form of malnutrition, and it is indicated that underweight is the single largest risk factor contributing to the global burden of disease in the developing world. An estimated 80% of world's stunted children lived in just fourteen countries, Ethiopia is found in the seventh rank. This study tried to show the prevalence of malnutrition in Burayu Town, that fills the knowledge gap, because there is no prior research on the zone. Second, the research tries to see the associated factors that are contributing for the prevalence of malnutrition in the zone, which can help to develop a better intervention strategy. To alleviate this problem, it is necessary to determine the nature, magnitude, and determinants of under nutrition.

Objective: - To determine the prevalence of malnutrition and associated factors among ages 6-59 months of children in Burayu Town, Ethiopia 2017.

Method and Analysis: - A community based cross-sectional quantitative study was conducted from February to April 2017. A systematic random sampling technique was used to select sample of 420 under five children aged 6-59 months old. Data was collected using semi structured questionnaire, and anthropometric measurement. Data was entered into Epidata 7 and exported to SPSS version 21 for analysis. The data was coded, edited, and cleaned, before statistical analysis. WHO Antroplus software was used to compute (WAZ) weight for age z-score ,(HAZ) height for age z-score and (WHZ) weight for height z-score. Descriptive statistics such as frequency, percentages, cross tabulation and graph was used to describe the prevalence and associated factors of under nutrition. Bivariate and multivariable logistic regressions were used to explore associations. Statistically significant associations were declared association at p-value of <0.05.

Result: Out of the total 413 study subjects 64(15.5%), 72 (17.4%) and 45(10.9%) were stunted, wasted and underweight respectively. Male sex {AOR=1.86; CI (1.01-3.41)} and decision on family monthly income by only husband {AOR=3.72; CI (1.32-10.48)} were associated with stunting. Male sex {AOR=1.76; CI (1.01-3.06)} and used untreated water {AOR=2.1; CI (1.2-3.77)} were associated with wasting. Use of untreated water {AOR=2.3; CI (1.23-4.61)} and male sex {AOR=2.65; CI (1.33-35.3)} were associated with underweight.

Conclusion and Recommendation: The study revealed that wasting was high among children below five years of age in Burayu town. Stunting and underweight were slightly high. There is a need to design and implement community based intervention to decrease malnutrition.

Key words: Children, Under nutrition, Stunting, Wasting and Underweight; Burayu Town.

INTRODUCTION

1.1. Background

Under five ages is a decisive period of development because it represents the transition between life as a child, and life as an adolescents covering the ages between 6-59 months. Increased nutritional needs at this juncture relate to the fact that under five gain up to 50% of their adult weight, more than 20% of their adult height, and 50% of their adult skeletal mass during this period (1,2).

Child malnutrition is one of the measures of health status that the World Health Organization (WHO) recommends for equity in health. The term malnutrition generally refers to both under nutrition and over nutrition (2). Stunting, wasting, and underweight are among those Anthropometric indicators are commonly used to measure malnutrition in a population of under five children. Underweight (low weight-for-age) reflects both low height-for-age and low weight-for-age and therefore reflects both cumulative and acute exposures of malnutrition (3).

Vicious interactions between malnutrition, poor health, and impaired cognitive development set children on lower development paths and lead to irreversible changes (4,5). Currently, under five children face a series of serious nutritional challenges which would affect this rapid growth spurt as well as their health as adults. Yearly, 3.5 million children under 5 years of age die in the world, as well as it is at third level in the world of the disease burden in this age group (6,7).

Even though globally, childhood malnutrition declined relatively during the last two decades; its prevalence in Africa actually increased even during these decades (8). More than 25% under five children in the developing world are malnourished which accounts about 143 million children. Out of these, approximately 70% live in just 10 countries in Sub-Saharan Africa region and more than one fourth of children under five are malnourished (in Nigeria and Ethiopia alone accounts more than 33%) (8,9).

Under nutrition in under five years of age still remains a public health problem mostly in developing countries together with Ethiopia. On top of that, Burayu Town is one of the fastest growing Towns in terms of population in Ethiopia (10). Children under five years age are more than 11% of the total population of the zone, which population is projected to be around 85 thousands (11). So the prevalence of under nutrition among under 5 year's children in the Town cannot be taken lightly.

1.2. Statement of the problem

Under five period is the time when the nutrient requirements of the body are high and poor nutritional status during this time is an important determinant of health outcomes. According to the WHO, it leads to nearly 15 percent of the total disability-adjusted life year's losses in countries with high children mortality. It is also proved that 1% loss in adult height occurred due to childhood stunting which in return associate with 1.4% loss in productivity. Poor nutrition and health among children contribute to the general inefficiency of education systems worldwide (12,13).

WHO estimated that there are 178 million malnourished children across the globe, and at any given moment, 20 million of these are suffering from the most severe form of malnutrition, and it is indicated that underweight is the single largest risk factor contributing to the global burden of disease in the developing world (14,15). While more than 178 million children under five years of age affected with under nutrition, 26% of which were stunted. This figure reduced by 35% from 253 million in 1990 (16).

Due to its immense population size, socio-economic disparities, and inadequate access to health facilities, the prevalence of under nutrition is a major public health concern in many of the developing countries. The prevalence of stunting was 36% in Africa and 27% in Asia. These remain a public health problem, one that often goes unrecognized. More than 90% of stunted children in the world have been living in Africa and Asia. An estimated 80% of world's stunted children lived in just fourteen countries, Ethiopia is found in the seventh rank. Sub-Saharan Africa and South Asia belong to more than seventy percent of the world's stunted children, 40%, and 39%, respectively (8,17).

An estimated 101 million children below five years of age were underweight in this world. These accounted for 16% of children below five years of age. The prevalence of wasting was the highest in South Asia, which was approximately 16%. This moderate or severe wasting was the highest in India, which had more than 25 million wasted children (2).

About one-third of deaths among children below five years of age were attributed to under nutrition and it can lead children to be at greater risk of death and severe illness due to common childhood infections, such as pneumonia, diarrhea, malaria, human immunodeficiency virus, or AIDS and measles (18).

It is not only an important cause of mortality and morbidity but also leads to physical and mental impairment in children. Health and physical consequences of prolonged states of malnourishment among children were delay in their physical growth, lower intellectual quotient, poor cognitive ability, decreased economic productivity, decreased reproductive performance, poor school

achievement and poor school performance, greater behavioral problems and deficient social skills, and susceptibility to contracting diseases (15,19). Under five period is the best window of opportunity to implement strategies to correct growth deficits, and knowledge of the main risk factors and risk group is required to design and target appropriate interventions (16).

The 2011 EDHS report showed that stunting was 58% in 2000, 51% in 2005, and 44% in 2011. This report also showed that wasting was 12% from 2000 to 2005 and 10% in 2011. The third predictor is underweight, which was 41% in 2000, 33% in 2005, and 29% in 2011 (14,20). The national trend showed that stunting and underweight prevalence continued to decrease but at a slow pace.

1.3 Significance of the study

Malnutrition is a major public health problem among under five children. More than one-third of deaths during the first five years of life are attributed to under nutrition, which are mostly preventable through economic development and public health measures. Despite emergence of a number of advancements in areas of nutrition surveys in developing countries, the level of under nutrition still remains as one of the public health importance, Ethiopia is no exception. To alleviate this problem, it is necessary to determine the nature, magnitude, and determinants of under nutrition.

Many studies have done on child malnutrition in different parts of the country, yet under nutrition in children who are 6-59 months of age and who are living in the growing towns like, special Zones surrounding Addis Ababa, are not commonly included in nutrition surveys, and an up-to-date overview of their nutritional status across the area is not available.

The present study aims at assessing the prevalence of under nutrition and its associated factors in Burayu Town. In doing so it tries to achieve two things. First, it tries to show the prevalence of malnutrition in Burayu Town, that fills the knowledge gap, because there is no prior research on the zone. Second, the research tries to see the associated factors that are contributing for the prevalence of malnutrition in the zone, which can help to develop a better intervention strategy. Additionally, the research can be used as starting point for next coming researchers. And this study also can be used for policy makers based on the findings to give awareness for the community about malnutrition and its preventions through the health workers who are working at the community level.

LITERATURE REVIEW

2.1. Malnutrition

Malnutrition is widely recognized as a major health problem in developing countries. Growing children in particular are most vulnerable to its consequences. The frequency of malnutrition cannot be easily estimated from the prevalence of commonly-recognized clinical syndromes, such as Marasmus and kwashiorkor because these constitute syndromes only, cases with mild-to-moderate malnutrition are likely to remain unrecognized because clinical criteria for their diagnosis are imprecise and are difficult to interpret accurately (21).

Malnutrition refers to both dietary condition caused by a deficiency or excess of one or more essential nutrients in the diet. Many factors can cause malnutrition, most of which relate to poor diet or severe and repeated infections, particularly in underprivileged populations. Inadequate diet and disease, in turn, are closely linked to the general standard of living, the environmental conditions, and whether a population is able to meet its basic needs such as food, housing and health care.

Malnutrition is thus a health outcome as well as a risk factor for disease and exacerbated malnutrition, and it can increase the risk of both morbidity and mortality. Although it is rarely the direct cause of death (except in extreme situations, such as famine), child malnutrition was associated with 54% of child deaths (10.8 million children) in developing countries (10). Nutritional status is clearly compromised by diseases with an environmental component, such as those carried by insect or protozoan vectors, or those caused by an environment deficient in micronutrients (22).

2.2. Prevalence of malnutrition in under five children

Worldwide about 780 million people are estimated to be energy deficient according to WHO standards. The prevalence of stunting may be as high as 65% in India. Protein energy malnutrition raises the risk of death and may reduce physical and mental capacity (23).

A report by UNICEF published in 2006 states that around 146 million children in developing countries are underweight - that is one out of every fourth child. Out of these, over half of the world's underweight children live in just three countries: Bangladesh, India, and Pakistan (24).

Overall half of the young children in India are underweight 47%, stunted 46%, one in six children are wasted 16%, the levels of under nutrition are much higher in rural areas than urban areas, but even in urban areas more than one third of young children are stunted. A report from Bangladesh, indicate that, about half of the children are underweight in Orissa, Maharashtra, and west Bengal.

Whereas, in rural areas, 20.3% of the children were severely malnourished, 30.2% were moderately malnourished, 50.5% were malnourished (moderate and severe) (25). In urban areas 12% of the children were severely malnourished, 27% of the moderately malnourished and 39% were malnourished (moderate and severe). Malnutrition levels were much higher among tribal children in rural areas in Maharashtra the incidence is as high as 73.6% (25).

Although child malnutrition declined globally during the 1990s, with the prevalence of underweight children falling from 27% to 22%, national levels of malnutrition still vary considerably (0% in Australia; 49% in Afghanistan) (26). The largest decline in the level of child malnutrition was in eastern Asia where underweight levels decreased by one half between 1990 and 2000. In Africa, the number of underweight children actually increased between 1990 and 2000 (from 26 million to 32 million), and 25% of all children under five years old are underweight, which signals that little changed from a decade earlier(7).

2.3. Causes of malnutrition in under five children

Childhood malnutrition is influenced by multidimensional factors. These factors vary from biological, behavioral, and environmental. Study done in Rome among preschool children living in urban settlements showed a clear disadvantage with close to three times the likelihood of being wasted compared to those living in rural areas. There was a suggestion that maternal, but not paternal, education was associated with stunting, and maternal literacy was significantly associated with wasting. Whether children were ever breastfed, immunized or had diarrheal episodes in the past two weeks did not show strong correlations to children malnutrition status in this Roma population (27).

Malnutrition affects one out of every three preschool age children living in developing countries. In South Asia, increases in women's status have a strong influence on both the long- and short-term nutritional status of children, leading to reductions in both stunting and wasting. A cross-sectional survey conducted on the nutritional status of preschool-age children in a development area in the southern Indian state of Tamil Nadu revealed that 45% of the children were underweight (low weight-for-age), 51% were stunted (low height-for-age), and 21% were wasted (low weight-for-height) (1). These studies also stated that rates of severe malnutrition using any of these criteria were low, and only 9.6% of the children were both wasted and stunted. The nature of the malnutrition strongly depended on age group. Rates of stunting increased with age, reaching 63% in the fifth year of life, whereas rates of wasting peaked at 36% in the second year of life and declined to 14% in the fifth year (1).

In Sub-Saharan Africa too, women's status and the long- and short-term nutritional status of children are linked (22). The most immediate (proximate) determinants are poor diet and disease which are themselves caused by a set of underlying factors; household food security, maternal/ child caring practices and access to health services and healthy environment. These underlying factors themselves are influenced by the basic socio-economic and political conditions (10) .

A cross sectional survey was conducted on risk factor for early childhood malnutrition in Uganda with a child <30 months of age revealed that a large minority (21.5%) of the children surveyed were found in poor health after clinical examination: 3.8% being classified as suffering from kwashiorkor and 5.7% with Marasmus (6). A high proportion of children were stunted (23. 8%), underweight (24.1%), or had low MUAC (21.6%). Although rural living, poor health, the use of unprotected water supplies, lack of milk consumption, and lack of personal hygiene were shown as risk factors for Marasmus and underweight, different factors were found to be associated with risk of stunting and low MUAC, despite these three parameters being significantly correlated (14).

A cross sectional study conducted to estimate the level of malnutrition and identify the factors associated with among children in the five densely populated zones of the region in southern Ethiopia. The results showed that about 45% of children were stunted, 42% underweight, and 12% wasted (28). Age, preceding birth interval, and number of under-five children were associated with stunting. Moreover, number of antenatal visits the mother had during the pregnancy of the child and age at weaning, are linked to chronic malnutrition (8).

A case control study was conducted to assess the risk factors for severe acute malnutrition in children under five in Ethiopia in Gondar university hospital showed that , the mean age of the cases and controls were 24.1 (+ 14.8) and 21.5 (+16.2) months, respectively. The socioeconomic risk factors for severe acute malnutrition were maternal illiteracy, paternal illiteracy, monthly family income of less than 50 USD and large family size with the number of children greater than three, Inappropriate infant and young child feeding practices were commonly seen in children with severe acute malnutrition (29).

Although 93.1% of the children had been immunized against tuberculosis, polio, diphtheria, and measles and showed better general health than children who were not immunized, there was a high prevalence of infection in the week preceding the survey interview, including diarrhea (23.0%), malaria (32.3%), or cough/influenza. Risk factors for low MUAC were poor health, lack of meat and cow's milk consumption, low intake of energy from fat, and less well educated and older mothers. Food taboos had no influence on any of the anthropometric measurements. (72.8%) (1,22).

In Ethiopia too, malnutrition remains to be one of the main health challenges to children under-five. A study by COHA, cost hunger in Africa, shows the following: 81% of all cases of child malnutrition and its related pathologies go untreated, 44% of the health costs associated with malnutrition occur before the child turns 1 year-old, 28% of all child mortality in Ethiopia is associated with malnutrition. A, 16% of all repetitions in primary school are associated with stunting, Stunted children achieve 1.1 years less in school education. Child mortality associated with malnutrition has reduced Ethiopia's workforce by 8%. Sixty seven percent of the adult population in Ethiopia suffered from stunting as children, and the annual costs associated with child malnutrition are estimated at Ethiopian birr (ETB) 55.5 billion, which is equivalent to 16.5% of Growth Domestic Product (GDP). This shows that eliminating malnutrition in Ethiopia is a necessary step for growth and transformation (23,30).

2.4. Conceptual framework

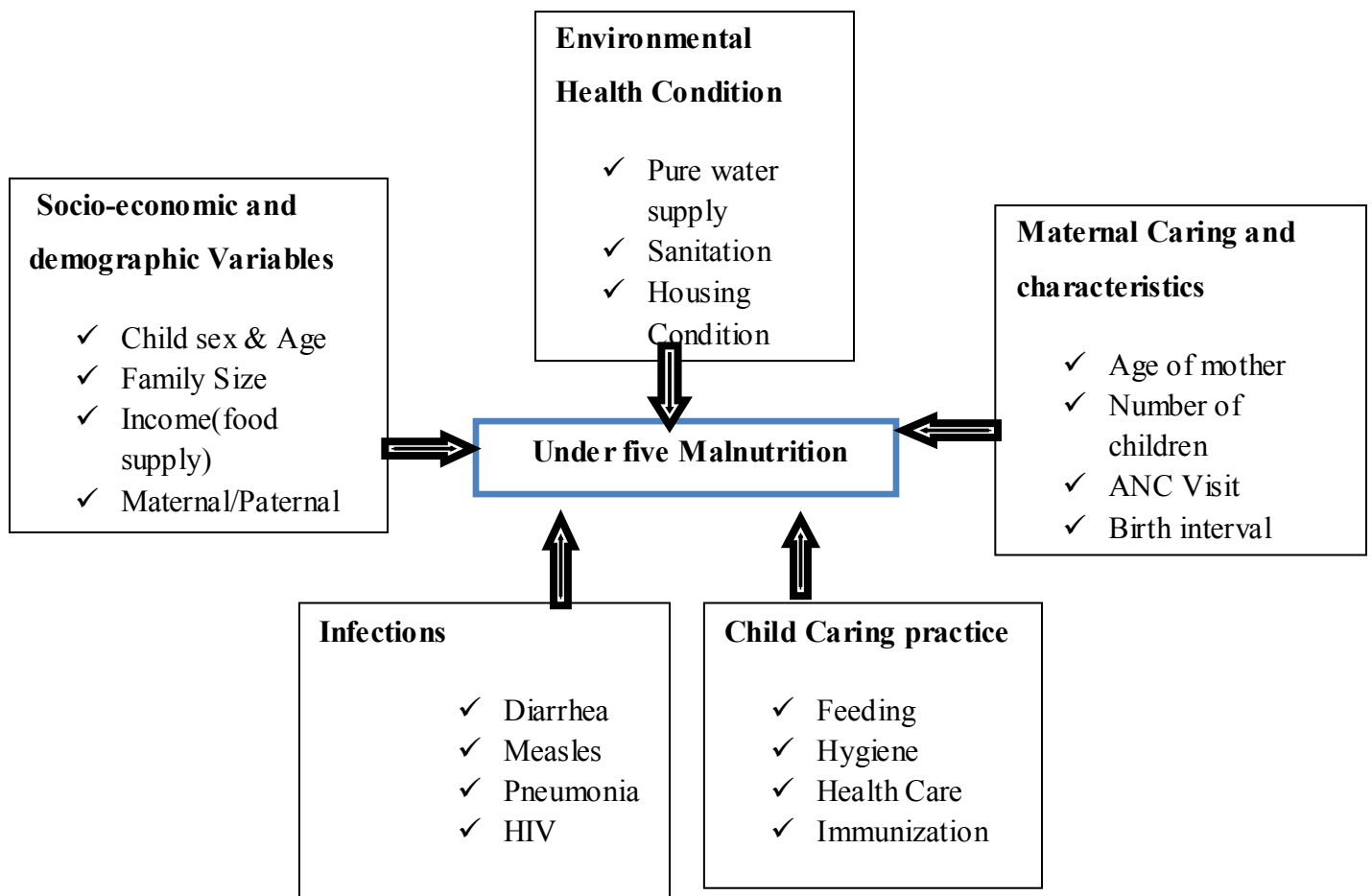


Figure 1: The conceptual framework of prevalence and associated factors of malnutrition among ages 6-59 months of children in Burayu Town, Oromia, Ethiopia, 2017 (3)

OBJECTIVES

3.1. General objective

The general objective of the study was to assess the prevalence of malnutrition and associated factors among ages 6-59 months of children in Bureau Town, Oromia, Ethiopia 2017.

3.2. Specific Objectives

- To estimate prevalence of malnutrition in 6-59 months of children.
- To identify determinants of child malnutrition in the study area.

METHODOLOGY

4.1. Study area

The study was conducted in Burayu Town, Oromia Region, Ethiopia 2017. Bureau Town is one of the nine municipal town administrations in Oromia Special Zone Surrounding Fin fine. It is located towards the North West on the way to Ambo, about 15 km from the outside limits of Addis Ababa. The 2007 national census report shows that there are 4,448,000 children in Oromia regional state who are under five years of age. The general population of Oromia national region is **28,859,862**. From this we can see that 15.3% of the General population of the region is children under five. According to, the 2007 census report, there are 63, 889 general populations in Bureau Town and total households are 11, 278 . The Town has 6 kebeles.

4.2. STUDY DESIGN AND PERIOD

A community based cross-sectional quantitative study design was conducted from February to April 2017.

4.3. POPULATION

4.3.1. Source population

All 6-59 months of children who were living in Burayu Town at the time of the study were source population.

4.3.2. Study population

All randomly sampled 6-59 months of children residing in Burayu Town at the time of the study were study population.

4.4. ELIGIBILITY CRITERIA:

4.4.1. Inclusion criteria

All under five children aged 6-59 months living in the selected kebele, Burayu Town were included.

4.4.2. Exclusion criteria

All children who are critically ill at the time of the study were excluded.

4.5. SAMPLE SIZE DETERMINATION AND SAMPLING PROCEDURE

4.5.1. Sample size determination

Sample size was determined using single population proportion formula by considering prevalence of under-five malnutrition. The previous study done on the subject among under five children in Ethiopia was considered. The best estimate of expected population proportion was considered as 47% to get maximum sample size (31).

$$ni = \frac{(z_{\alpha/2})^2 * p(1 - p)}{d^2}$$

Where, ni=initial sample size

$z_{\alpha/2}$ = confidence interval (95%)

p= proportion of under fiver malnutrition; 47%=0.47

d= is the margin of sampling error tolerated (5%) = 0.05

$$ni = (1.96)^2 (0.47) (1-0.47) / (0.05)^2 = 382$$

For possible non-response rate, 10% is added to the sample size.

Thus, the total final sample size is: $ni + 10\% ni = 382 + (10 \times 382)/100 = 382 + 38 = 420$.

4.3.2. SAMPLING PROCEDURE

Burayu Town has 6 kebeles; from this kebeles 3 kebeles were randomly selected for this study to get the representative sample. Then, for each selected kebele number of total households were obtained. The study participants were selected from the target population through a systematic random sampling technique and probability proportionate to size of the households from each selected kebeles. The calculated sample size of 420 was distributed among each selected kebele proportionally to the size of the household in kebele to determine the number of individuals to be studied in each kebele. Then, every 17th units of households were visited systematically to choose one child aged between 6 and 59 months old for assessment in all selected kebeles. When more than one eligible participant was found in the selected house hold, one child aged 6-59 months old present in the house was selected randomly (**table 1**).

$$nc = \frac{n * Nx}{N}$$

Where; n = total sample size=420

nc = sample size in stratum x

N = number of source population=7310

Nx = population size in stratum x = number of stratum (Kebeles x=1, 2, and 3).

Name of the selected kebeles	No. of house holds	No. of households to be selected
Gafersa Burraayyuu	2196	126
Burayu Keta	2302	132
Leku Keta	2812	162
Total	7310	420

Table1. Presentation of the sampling procedure that was used to select study participants in Burayu Town, Oromia, Ethiopia, 2017.

4.5. STUDY VARIABLES

4.5.1. Dependent variable

The dependent variable of the study is under five malnutrition

4.5.2. Independent variables

Socio-economic and demographic variable= child sex & age, family size, income (food supply), maternal/ paternal education

Infections : diarrhea ,measles, pneumonia, HIV

Child caring

practice : feeding, hygiene, health care, immunization

Maternal caring and characteristics : age of mother, number of children, ANC visit, birth interval

Environmental health condition: pure water supply, sanitation, housing condition

4.6. OPERATIONAL DEFINITIONS.

Anthropometry: Measurement of the variation of physical dimensions and the gross composition of the human body at different age levels and degrees of nutrition by weight-for-age, height-for-age and weight-for-height.

Family size: refers to the total number of people living in a house and share the same dinning dish-with in a family member.

Income : It is periodical monthly earning from one's business, lands, work, investment etc.

Hygiene: a practice of hand washing at the time of food preparation, after toilet, cleaning the baby and at the time of eating food.

Good housing condition: house having, adequate ventilations, cement floor, presence of separate latrine.

Poor housing condition: is living with cattle, lack of ventilations, dust floor and lack of latrine.

Pure water supply: is defined as presence of tap water, drinking boiled water or treated with wuha agar.

Malnourished: A child is labeled as malnourished if any of the nutritional assessment indicates weight for height, weight for age, or height for age is abnormal.

Stunting: A child is defined as stunted if the height for age index is found to be below -2 SD of the median of the standard curve. Severe stunting is diagnosed if it is below -3 SD.

Underweight: Refers to a deficit and is defined as underweight below the -2 SD from the NCHS/WHO reference of the median of the standard curve. A severely underweight is diagnosed if it is below -3SD.

Wasting: Nutritional deficient state of recent onset related to sudden food deprivation or mal-absorption utilization of nutrients which results weight loss, weight-for-height below-2SD from the NCHS/WHO median value. Severe wastage is diagnosed if it is below -3SD.

4.7. DATA COLLECTION TOOLS AND PROCEDURE

A semi-structured interview administered questionnaire, which include all the relevant information to meet the objectives of the study was used to collect the participants' socio-demographic information (i.e. sex, age, marital status, ethnicity, religion, educational status, occupation, income, family size) and anthropometric measurements (i.e Wt. of the child in kg, Ht. of the child in cm, Middle Upper Arm Circumference, MUAC in cm). The tool was adapted from the World Health Organization instrument for stepwise surveillance for (WHO STEPS) child malnutrition. In accordance with the STEPS manual, a few additional questions were added to supplement the questionnaire and to reflect the local context of Ethiopia. It was first written in English, translated into Afan Oromo (local language), and was translated back into English by professionals who speak both languages for keeping consistency.

To make important modifications, the questionnaire was pre-tested on 5% of the sample randomly selected in the same population in adjacent kebeles. Six data collectors were recruited. Two supervisors (BSc) were involved to supervise overall situation of data collection procedure. In addition, one day training was given to data collectors and to the supervisors. Participants were informed about the content of the interviews to enable them understand the procedures and give their full approval.

4.8. DATA QUALITY CONTROL

Data was collected by trained diploma nurses of health extension workers. The collected data was checked for completeness and consistency on daily basis by supervisors. Visited houses were marked (given number) to avoid revisit by other data collectors and to enable revisit in case of incomplete and inconsistent responses. Before the actual data collection took place, pretest was done on the sample of 5% of the sample size, which was 20 in adjacent Kebele (Guje) to ensure the validity and reliability of methodology and survey tools. Based on the findings of the pretest, the tools were modified. After checking for completeness, the collected data was edited to exclude errors, re-organized, coded and entered into Epidata version 3.1 for double data entry verification (to identify data consistency), then was exported to SPSS version 23.00 for windows for cleaning and statistical analysis.

4.9. DATA ANALYSIS

The exported data was analyzed for frequency of distribution, proportion, and percentages for variables, mean, standard deviation (SD). First, data on the prevalence of each child's nutritional status was presented. Bivariate and multivariable logistic regressions analysis were conducted to explore presence of associations and identify independent predictors of dichotomized nutritional status score as dependent variable. Then, variables with P-value of <0.25 at the analysis was entered into multivariable logistic regression in order to identify interaction between the variables and to control potential confounders as well as to calculate odds ratios with 95% confidence intervals. Variables having p-value of less than **0.05** was declared associated with under five malnutrition. Finally, results were presented in tables, graphs and interpretations of findings were made as possible.

4.10. MEASUREMENTS.

Anthropometric measurements (weight and height) were done .A portable weight scale was used to measure older children (above two years) and length board was used for younger children (less than two years). Older children were measured at standing position, while younger children less than two years were measured at lie down position. The child was measured without shoes, hats, and hair ornaments. During measurement their head, shoulders, buttocks, and heels were attached with the vertical surface of the stadiometer. The height measurement was recorded to the nearest 0.1 cm. Weight was measured using infant and toddler weighting scales. The scale was zeroed for each measurement. Each child was measured with bare foot and light clothing. Infants were measured in supine position and older children were measured in sitting position. Weight was recorded immediately after measurement to the nearest 0.1 kg. Underweight, wasting, and stunting were computed using weight and height measurement.

4.11. ETHICAL CONSIDERATION.

The study was approved by IRB (Institutional Review board) of the College of health Sciences' research and publication office, Addis Ababa University. Official letters were written by School of Nursing and Midwifery, Addis Ababa University to the respective officials of the Burayu administrative Health Bauru officers as well as to every administrators of the selected kebele to obtain permission. Informed verbal consent of the respondents was obtained after giving information and thoroughly explaining the aim of the study to each respondent. The participants were interviewed in their homes individually to maintain privacy. They were not required to give their name.

5.RESULT

5.1 Socio demographic characteristics of the study participants

A total of 420 under five years of age were targeted for the study, of which 413 responded making the response rate 98.8%. About 239 of study participants were married and the dominant religion was orthodox Christian which was 170(41.2%).

The percentage distribution of under-five children according to the educational level of the mother indicates that majority of the mothers could only read and write (29.1%) and 25.2 % of them had never been to school. The finding further revealed that only 16.5 % of the children had mothers with graduated from college and above. Concerning occupation of the mother 295(71.4%) of the study participants were house wife. Regarding to the head of house hold 305 (73.8%) were males (Table 1).

Table 1: socio demographic characteristics of the respondents in Burayu, Oromia, Ethiopia, 2017 (n=413).

Variable	Frequency	Percentage
Head of the house hold		
Male	305	73.8%
Female	108	26.2%
Marital status		
Married	392	94.9%
Divorced	8	1.9%
Widowed	6	1.5%
Separated	4	1%
Single	3	0.7%
Maternal educational status		
Illiterate	104	25.2%
Read and write	120	29.1%
Elementary	49	11.9%
High school	72	17.4%
College	68	16.5%
Paternal educational status		
Illiterate	51	12.3%
Read and write	63	15.3%
Elementary	61	14.8%
High school	132	32%
College	106	25.7%

Occupation of the mother		
House wife	295	71.4%
Merchant/ trade	29	7%
Private organization employee	18	4.4%
Government employee	37	9%
Daily laborer	34	8.2%
Occupation of father		
Government employee	77	18.6%
Merchant/ trade	67	16.2%
Private organization employee	140	33.9%
Daily laborer	108	26.2%
Other	21	5.1%
Ethnicity		
Oromo	197	47.7%
Amhara	102	24.7%
Tigre	17	4.1%
Gurage	56	13.6%
Other	41	9.9%
Religion		
Orthodox	170	41.2%
Protestant	161	39%
Catholic	9	2.1%
Muslim	73	17.7%

5.2 Decision making and family size of the study participants

Regarding to decision making of the partner, 222(53.8%) of house and wife jointly make decision in the house and 281 (68 %) of them had 2 to5 family size (Table 2).

Table 2: Decision making and family size of the respondents in Burayu, Oromia, Ethiopia, 2017 (n=413).

Variable	Frequency	Percentage
Total family size		
2-5	281	68%
>5	132	32%

Number of children		
1	300	72.6%
2	101	24.5%
3	12	2.9%
Who decides how the money will be used		
Mainly wife	40	9.7%
Mainly husband	124	30%
Only husband	46	11.1%
Both jointly	203	49.2%
Decision maker in the house		
Mainly wife	38	9.2%
Mainly husband	126	30.5%
Only husband	25	6.1%
Both jointly	222	53.8%
Both independently	2	0.5%

5.3 Child characteristics

Child characters were divided into characteristics related to birth, immunization status and health status as presented below.

5.3.1 child characteristics related to birth

About 363 (87.9%) of the Children were born at health institution and around 261 (63.2 %) of their gestational age at birth was greater than nine months. More than half of the under-five children in the study were females (50.8%) and majority were aged 12-23 months (23.2 %) and followed by those aged 24-35 months (20.6 %) respectively.

Half of the children (71.2%) were of birth order 1-2 with a few in the birth order of 3-4 (23.7%) and 5+ order (5.1%) respectively. And 217 (52.5%) Childs were not weighted at birth.

The immunization status of the under-five children that were involved in the study reveals that majority of the children (98.1 %) were immunized. Regarding to BacilleCalmette-Guerin (BCG) immunization, most of the children had BCG scars (89.1 %) and non-immunized children were only 9%. On vitamin A supplement administration, majority of the children do not received vitamin A supplement 71.1 % and 28.8% were received vitamin A within the past six months prior to the survey (Table 3)

Table 3: Child characteristics related to birth of under-five, Burayu, Oromia, Ethiopia, 2017 (n=413).

Variable	Frequency	Percentage
Child sex		
Male	203	49.2%
Female	210	50.8%
Child age		
6-11	80	19.4%
12-23	96	23.2%
24-35	85	20.6%
36-47	74	17.9%
48-59	98	18.9%
Birth order		
1-2	294	71.2%
3-4	98	23.7%
≥ 5	21	5.1%
Place of delivery		
Home	39	9.4%
Health institution	363	87.9%
Other	11	2.7%
Gestational age at birth		
Less than 9 months	21	5.1%
At 9 months	128	31%
Greater than 9 months	261	63.2%
Do not know /not sure	3	0.7%
Was child weighted at birth		
Yes	196	47.5%
No	217	52.5%
Type of birth		
Twin	101	24.5%
Single	312	75.5%
Was it planned pregnancy		
Yes	378	91.5 %
No	35	8.5 %
Ever immunized		
Yes	405	98.1%
No	8%	1.9%

Take BCG	368	89.1%
Yes	37	9%
No		
Take DPT	363	87.9 %
Yes	42	10.2%
No		
Take measles	330	79.9%
Yes	75	18.2%
No		
Vit. A supplementation in the past 6 months	119	28.8%
Yes	291	71.1%
No		
Child has card	362	89.6%
Yes	43	10.4%
No		

5.3.2 Health status of the child

Concerning to health status of the child involved in the study, common cold (32.9%) and fever (7.3%) were frequently mentioned health problem of the children. For 53.8% of the children, mothers did not know the frequent health problem of their child (Table 4).

Table 4: Health status of under five children in Burayu, **Oromia**, Ethiopia, 2017 (n=413).

Under five child health status		Frequency	Percentage
Frequent health problem of the child	Fever	30	7.3%
	Common cold	136	32.9%
	Diarrhea	5	1.2%
	Pneumonia	13	3.1 %
	Other	7	1.7 %
	Don't know	222	53.8%
Child had diarrhea in the last two weeks	Yes	50	12.1%
	No	339	82.1%
How frequent the diarrhea in a year	Once	56	13.6%
	Twice	103	24.9%
	3-4 times	70	16.9%
	Nothing	184	44.6%
Fever at any time in the last two weeks	Yes	33	8%
	No	359	86.9%
Respiratory disease in the last two weeks	Yes	10	2.4%
	No	385	93.2 %
	Don't know / I am	18	4.4 %

	not sure		
Sick with measles in the last year	Yes	7	1.7%
	No	396	95.9%
	Don't know/ I am	10	2.4%
	not sure		
Presence of edema on the child	Yes	0	0%
	No	413	100%

5.3 Child caring practice

The study revealed that most of the mother, 80.4% were ever breast feed their child. Eighty five percent of the women start breast feeding immediately after birth and majority of them 88.4% fed their child with colostrum after birth.

Among all the participants, 14.8% gave pre lactation food or fluid for the child and 77.7% of the respondents gave additional food or fluid other than breast milk in the past 48 hours prior to the survey and 21.1% of children started additional food at age less than five months. Majority 81.1% of the child feeding practice was not changed during the presence of illness (Table 5).

Table 5: Caring practice among children under five, Burayu, Oromia, Ethiopia, 2017 (n=413).

Variable	Frequency	Percentage
Did you ever breast feed your child		
Yes	332	80.4%
No	81	19.6%
Reason for not breast feeding		
No breast milk	19	4.6%
No time	2	0.5%
Other	60	14.5%
How long after birth did you first offer the child to breast feed		
Immediately	352	85.2%
Less than 2 hours	51	12.3%
Greater than 2 hours	4	1%
Don't know/ not sure	6	1.5%
Did you give the child pre-lactation food/fluid		
Yes	61	14.8%
No	352	85.2%

What did you give for the child		
Water	20	4.8%
Butter	7	1.7%
Milk	29	7.0%
Others	5	1.2%
Did you squeeze out and throw the first milk		
Yes	48	11.6%
No	365	88.4%
Still breast feed		
Yes	177	42.9%
No	236	57.1%
How many times did you breastfeed in 24 hours		
0-2	21	13.1%
3-5	53	11.9%
6-8	49	12.8%
>9	54	5.1%
Do you breast feed in the night		
Yes	158	38.3%
No	19	4.6%
Total	177	42.9%
Did you give additional food or fluid other than breast milk in the past 48 hours		
Yes	321	77.7%
No	92	22.3%
What ingredient did you give for the child		
Cow's milk	183	44.3%
Butter	5	1.2%
Sugar solution	34	8.2%
Formula milk	98	23.7%
Bula	3	.7%
Number of feeding in 24 hours		
0-2	115	
3-5	175	
>6	33	
Age you started feeding additional food		
0-5	87	21.1%
>6	324	78.9%
Material used to feed the child		
Bottle	144	27.6%
Cup	47	11.4%
Spoon	225	54.5%
Others	27	6.5%

For how long did you breastfeed the child		
<4	139	33.7%
4-6	44	10.7%
>6	230	55.7%
For how long did you exclusive breast feed your child		
<4	90	21.8%
4-6	312	75.5%
>6	11	2.7%
Who takes care of the baby feeding		
Mother	296	71.7%
Sister	34	8.2%
Grand mother	80	19.4%
Servant	1	.2%
Other	2	.5%
During the illness has feeding practice changed		
Yes	75	18.2%
No	338	81.8%
How could the practice changed		
Preventing from breast	35	8.5%
Preventing from giving food	5	1.2%
Providing additional food	18	4.4%
Other	19	4.6%
Bath taking of the child		
Daily	255	61.7%
Weekly	68	16.5%
Other	90	21.8%
How frequent you wash their equipment		
Twice daily	136	32.9%
Once daily	44	10.7%
Every other day	12	2.9%
Immediately after use	221	53.5%
How do you treat your child when get sick		
Usually home treatment	32	7.7%
Taking to traditional healers	22	5.3%
Taking health institutions	223	78.2%
Other	36	8.7%
Have you ever taken your child to health institution when get sick		
Yes	191	46.2%
No	222	53.8%

How many times you ever taken your child to health institution		
0-2	143	34.6 %
3-5	51	12.3 %
>6	3	0.7 %

5.4 Maternal characteristics

Among the women those participated in the study 65.6% didn't eat extra food consumed during pregnancy or lactation and 16.7% of them had faced health problem during pregnancy. Majority 88.6% of the women involved in the study follows ant natal care during their pregnancy.

Concerning to family planning utilization 93.5% of the women had ever used family planning and the majority 50.4% used depo Provera method. In relation to hand washing, 87.2% wash their hand after latrine, 96.1% before preparing food and 94.9% before serving food (Table 6).

Table 6: Maternal characteristics of children under five, Burayu, Oromia, Ethiopia, 2017, (n=413).

Variables	Frequency	Percentage
Mothers age in years		
≤18	2	0.5%
>18	411	99.5%
Age at first birth		
≤18	56	13.6%
>18	357	86.4%
Total number of children		
≤ 4	388	93.9%
> 4	25	6.1%
Extra food consumed during pregnancy or lactation		
Yes	142	34.4%
No	271	65.6%
Health status during pregnancy		
Good	344	83.3%
Not good\sick	69	16.7%

ANC follow up		
Yes	366	88.6%
No	47	11.4%
Do you know about family planning		
Yes	400	96.9%
NO	13	3.1%
Have you ever used family planning		
Yes	386	93.5%
No	27	6.5%
Method used		
Pills	90	21.8%
Depo-provera	208	50.4%
Norplant	77	18.6%
Condom	1	.2%
Other	10	2.4%
Do you use it now		
Yes	326	78.9%
No	60	14.5%
Washing hands		
After latrine	360	87.2 %
before preparing food	397	96.1%
before serving food	392	94.9%
after cleaning child feaces	231	55.9%
How do you wash your hands		
Using water only	93	22.5%
Using soap sometimes	224	54.2%
Using soap always	95	23.0%
Using ashes sometimes	1	.2%

5.5 Environmental conditions

The main source of drinking water for the respondents was private tap (87.4%) and 56.9% of them drink after treating water. Even if they are living in urban areas 4.4 % of then did not have their own

latrine while 95.6% had latrine. And 10.9% and 20.3% dispose the garbage in the open field and common pit respectively.

Almost eight percent of the participants use separate room for kitchen and half of them uses electricity to cook and 45.3% of their house type floor was soil (Table 7).

Table 7: Environmental conditions of children under five, Burayu, Oromia, Ethiopia, 2017, (n=413).

Main source of drinking water		
River	4	1.0%
Private well	14	3.4%
Public tap	30	7.3%
Private tap	365	88.4%
Do you treat water		
Yes	235	56.9%
No	178	43.1%
Do you have latrine?		
Yes	395	95.6%
No	18	4.4%
Type of latrine		
Private pit\ wooden slab	46	11.1%
Private slab \ cement	115	27.8%
Shared latrine /wooden slab	143	34.6%
Shared VIP latrine	94	22.8%
Other	15	3.6%

How you dispose garbage

Open field disposal	45	10.9%
In a pit	43	10.4%
Common pit	84	20.3%
Composing	10	2.4%
Burning	59	14.3%
Other	172	41.6%

Type of house floor	187	45.3%
Earth\Soil	188	45.5%
Cement\Brik	3	.7%
Wooden\Bamboo	35	8.5%
Ceramic		

Presence of windows

Yes	368	89.1%
No	45	10.9%

5.6 Levels of malnutrition among under five children

Results indicate that stunting was the most common malnutrition problem (15.50%) among under five children in Burayu. There was also quite a high prevalence of wasting and underweight among under five children given. The levels of malnutrition among children under five years in Burayu is presented in (fig 1).

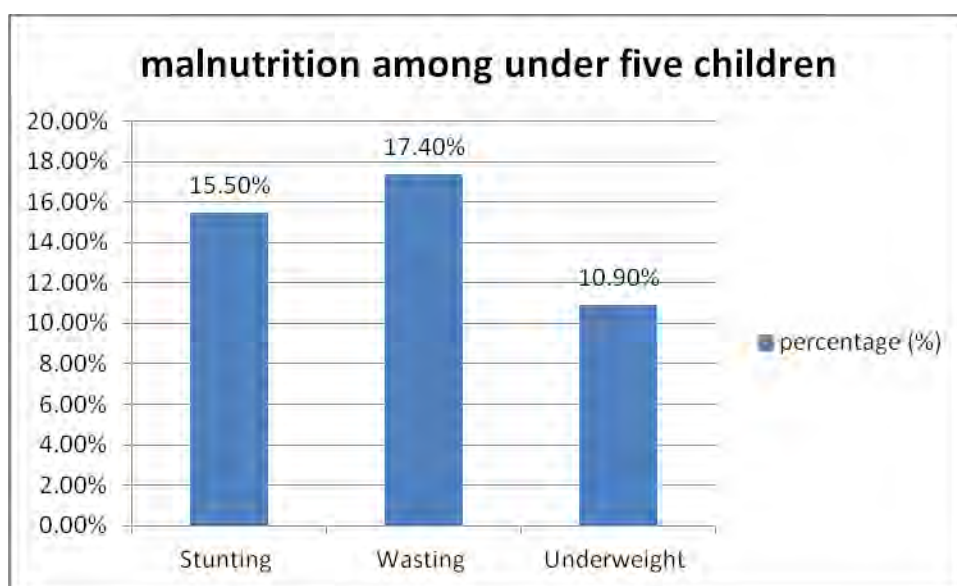


Fig 1 : Levels of malnutrition among under five children in Burayu. Oromia, Ethiopia, 2017, (n=413)

5.7 Factors associated with stunting

Bivariate and multivariate analysis were performed between stunting (dependent variable) and associated factors (independent variable).

Binary Logistic regression was performed to assess the association of each independent variable stunting malnutrition. The factors that showed a p-value of 0.2 and less were added to multivariate regression model. The model consists of five models. Male children were 1.86 times {**AOR=1.86; CI (1.01-3.41)**} more likely to develop stunting compared to female children.

The other variable that was associated with stunting was decision on the money. Children with the family those only husband decide on the money were 3.7 times {**AOR=3.72; CI (1.32-10.48)**} more

likely to develop stunting compared with the children with the family those mainly wife decided on the money (Table 8).

Table 8 : Factors associated with malnutrition stunting in Burayu town, Ethiopia, 2017, (n=413).

Variable	Stunting		COR, 95%CI	AOR, 95%CI
	Yes	No		
Age				
6-11	11(13.8%)	69(86.2%)	0.72 (0.308-1.72)	1.43 (0.55-3.72)
12-23			1.35 (0.64-2.87)	2.21 (0.94-5.18)
24-35			0.34 (0.12-0.95)	0.49 (0.17-1.43)
36-47			0.79 (0.33-1.89)	0.94 (0.36-2.43)
48-59			1	1
Sex				
Male	39(19.2%)	164(80.8%)	1.76 (1.02-3.03)*	1.86 (1.01-3.41)*
Female	25(11.9%)	185(88.1%)	1	1
Maternal education				
Illiterate	13(12.5%)	91(87.5%)	1	1
Read and write	23(19.2%)	97(80.8%)	1.6 (0.79-3.47)	1.08 (0.47-2.47)
Elementary	8(16.3%)	41(83.7%)	1.36 (0.52-3.54)	1.22 (0.43-3.43)
High school	8(11.1%)	64(88.9%)	0.87 (0.34-2.23)	0.99 (0.36-2.74)
College	12(17.6%)	56(82.4%)	1.5 (0.64-3.51)	1.3 (0.49-3.44)
Who decide on the money				
Mainly wife	8(20.0%)	32(80.0%)	1	1
Mainly husband	19(15.3%)	105(84.7%)	0.72 (0.29-1.8)	0.77 (0.28-2.16)
Only husband	21(45.7%)	25(54.3%)	3.3 (1.27-8.84)*	3.72 (1.32-10.48)*
Both jointly	16(7.9%)	187(92.1%)	0.3 (0.13-0.86)	0.3 (0.11-0.82)
Presence of windows				
Yes	61(16.6%)	307(83.4%)	1	1
No	3(6.7%)	42(93.3%)	0.35 (0.108-1.19)	0.33 (0.09-1.19)

5.8 Factors associated with wasting

Bivariate and multivariate analysis were performed between wasting (dependent variable) and associated factors (independent variable).

Binary Logistic regression was performed to assess the association of each independent variable wasting malnutrition .The factors that showed a p-value of 0.2 and less were added to multivariate regression model. In the binary logistic regression sex, maternal education, paternal education and

treating water were associated with wasting. In the multi logistic regression sex and treating water were remain significantly associated with malnutrition wasting.

Sex was significantly associated with wasting. Male children were 1.7 times {**AOR=1.76; CI (1.01-3.06)**} more likely to develop wasting compared with female children

The other variable that was associated with wasting was treating water before drink. Children with family those did not treat water were 2.1 times {**AOR=2.1; CI (1.2-3.77)**} more likely to develop wasting compared to children with family those treat water before they drink (Table 9).

Table 9 : Factors associated with malnutrition wasting in Burayu town, Ethiopia (n=413).

Variable	Wasting		COR, 95%CI	AOR, 95%CI
	Yes	No		
Sex				
Male	42(20.7%)	16(79.3%)	1.56 (1.93-2.6)*	1.76 (1.01-3.06)**
Female	30(14.3)	180(85.7%)	1	
Maternal education				
Illiterate	33(31.7%)	71(68.3%)	2.4 (1.1 -5.18)*	1.72 (0.6-4.9)
Read and write	15(12.5%)	105(87.5%)	0.7 (0.3-1.7)	0.5 (0.18-1.38)
Elementary	7(14.3%)	42(85.7%)	0.86 (0.3-2.41)	0.6 (0.21-2.04)
High school	6(8.3%)	66(91.7%)	0.47 (0.16-1.35)	0.3 (0.11-1.08)
College	11(16.2%)	57(83.8%)	1	1
Immunization status				
Yes	69(17.0%)	336(83.0%)	1	1
No	3(37.5%)	5(62.5%)	2.9 (0.68-12.5)	3.1 (0.64-14.8)
Do you treat water				
Yes	33(14.0%)	202(86.0%)	1	1
No	39(21.9%)	139(78.1%)	1.7 (1.03-2.86)*	2.1 (1.2-3.77)**
Paternal education				
Illiterate	17(33.3%)	34(66.7%)	3.57 (1.57-8.1)*	1.1 (0.32- 3.86)

Read and write	10(15.9%)	53(84.1%)	1.35 (0.55-3.2)	0.86 (0.28-2.64)
Elementary	13(21.3%)	48(78.7%)	1.93 (0.83-4.5)	1.58 (0.56-4.45)
High school	19(14.4%)	113(85.6%)	1.2 (0.56-2.5)	0.87 (0.36-2.07)
College	13(12.3%)	93(87.7%)	1	
Who decide on the money				
Mainly wife	10(25.0%)	30(75.0%)	1	1
Mainly husband	27(21.8%)	97(78.2%)	0.83 (0.36-1.92)	0.62 (0.25-1.56)
Only husband	5(10.9%)	41(89.1%)	0.36 (0.11-1.18)	0.25 (0.07-0.90)
Both jointly	30(14.8%)	173(85.2%)	0.52 (0.23-1.17)	0.41 (0.16-1.02)
Do you have latrine				
Yes	66(16.7%)	6(33.3%)	1	1
No	329(83.3%)	12(66.7%)	2.4 (0.903-6.87)	1.8 (0.54-6.09)

5.9 Factors associated with underweight

Bivariate and multivariate analysis were performed between underweight (dependent variable) and associated factors (independent variable).

Binary Logistic regression was performed to assess the association of each independent variable underweight malnutrition .The factors that showed a p-value of 0.2 and less were added to multivariate regression model.

Male children were 2.6 times **{AOR=2.65; CI (1.33-35.3)}** more likely to develop underweight compared to female children. Children with family those did not treat water were 2.3 times **{AOR=2.3; CI (1.23-4.61)}** more likely to develop underweight compared to children with family those treat water before they drink (Table 10).

Table 10 : Factors associated with malnutrition underweight in Burayu town, Ethiopia (n=413).

Variable	Underweight		COR, 95%CI	AOR, 95%CI
	Yes	No		
Sex				

Male	31(15.3%)	172(84.7%)	2.5 (1.3-4.89)*	2.65 (1.33-5.30)**
Female	14(6.7%)	196(93.3%)	1	1
Maternal education				
Illiterate	17(16.3)	87(83.7%)	1.2 (0.53-3.06)	1.12 (0.44-2.82)
Read and write	10(8.3%)	110(91.7%)	1.3 0.59 (0.22-1.54)	0.45 (0.16-1.21)
Elementary	5(10.2%)	44(89.8%)	0.74 (0.23-2.37)	0.63 (0.19-2.09)
High school	4(5.6%)	68(94.4%)	0.38 (0.11-1.31)	0.31 (0.09-1.13)
College	9(13.2%)	59(86.8%)	1	1
Extra food consumed during pregnancy or lactation				
Yes	20(14.1%)	122(85.9%)	0.6 (0.33-1.16)	0.58 (0.30-1.13)
No	25(9.2%)	246(90.85%)	1	1
Presence of window				
Yes	37(10.1%)	331(89.95)	1	1
No	8(17.8%)	37(82.2)%	0.51 (0.22-1.19)	1,9 (-.77-4.79)
Do you treat water				
Yes	18(7.75%)	217(92.3%)	1	1
No	27(15.2%)	151(84.8%)	2.1 (1.14-4.05)*	2.39 (1.23-4.61)**

6.DISCUSSION

This community based cross sectional study has attempted to assess the level of malnutrition for stunting, wasting and underweight in Burayyu Town, Oromia, Ethiopia.

The prevalence of malnutrition among surveyed currently under five children was 15.5 % for stunting, 17.4 % for wasting and 10.9 % for underweight. This finding was the same with the finding reported in west Gojjam(7). However, relatively high number of malnourished children was reported in the study conducted in Somali region, Ethiopia where stunting was 34.4 %, wasting 42.3% and 47.7 underweight (1). The difference of the result might be due to difference of the study location and economic status of the study participants. The current study was conducted nearby capital city of the country and the Somali was done the area where prevalence of malnutrition was high and the area where there is food insecurity. And also in India the study reported that relatively high number of malnutrition where underweight 47%, stunted 46%, and wasted 16% (13). The difference could be due to the difference in the study setting and time of the study conducted, the India was conducted in 2008

In the present study majority of the mothers were exclusively breast fed their child, where as 14.8% gave pre lactation food or fluid. Water, cattle milk and butter were the most commonly used foodstuffs for pre-lacteal feeding. This finding was comparable with the finding in Bule Hora where 12.1% children were given pre-lacteal feeding (31).

In the regression model the factors that were significantly associated with underweight was sex. Being male by sex {**AOR=2.65; CI (1.33-5.33)**} was significantly associated with underweight. This finding was consistent with the finding in west Gojjam where male children (AOR = 2.91, 95% CI: 1.430–5.915) were more likely to be under weight (7).

In the current study using untreated water was risk factor for wasting malnutrition {AOR=2.1; CI (1.2-3.77)} and underweight malnutrition {AOR=2.3; CI (1.23-4.61)}. This finding was comparable

with the finding reported in Uganda where using unprotected water was risk factor for malnutrition (14)

Infections play a major role in the etiology of under nutrition because they result in increased needs and high energy expenditure, lower appetite, nutrient losses due to vomiting, diarrhea, poor digestion, mal-absorption and the utilization of nutrients and disruption of metabolic equilibrium. In this study, presence of diarrheal morbidity in the last two weeks prior to data collection was the contributing factor for stunting, underweight and stunting. This study was consistent with the study conducted in bule hora (31).

7.LIMITATION AND STRENGTH

7.1 Strength

- The study was conducted in community level and had high representative.

7.1 limitation

- Since the study design is cross sectional it cannot revealed cause effect

8. CONCLUSION

According to the findings in this study wasting was high among children below five years of age in Burayyu town. Wasting and stunting were slightly high which was 17.40% and 15.50%. Males were more affected with stunting than females. Sex of the child, decision on the money and treating water before they use for drinking were factors that affected child's nutritional status. Provision of clean water for the community should be taken seriously since clean water will prevent the spread of water-borne diseases that can negatively affect the health and nutrition of young children. There is a need to design and implement community based intervention to decrease malnutrition.

9 RECOMMENDATIONS

Based on the above findings the following recommendations are forwarded for :

Health care providers

- Health care providers should provide education and necessary information on how to prevent malnutrition.

Community

- The community those live in Burayu town should treat water to use for drinking

Woreda health bureau

- First target should be mothers or caregivers of the children because of their essential role in malnutrition prevention.

Other researchers:

- Other research should be done to identify the quality of nutrients and their effect on malnutrition.

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ANNEX I: DATA COLLECTION TOOLS

Consent form

Greeting; good morning/good afternoon

Self-introducing: good morning/good afternoon my name is _____, I am working as data collector in this study that assess the prevalence and associating factors of malnutrition among under five children in Burayu Town of house hold and the investigator is doing her research for the partial fulfillment of Master's degree in pediatric and child health. You are kindly requested to participate and your child's weight and height will be taken in this study. Your participation in this study is completely on voluntary bases and you have the right to refuse, to take part or to interrupt at any time. There are no incentives to participate in this study.

We would like to assure you, your name will not be mentioned in anywhere. The information that you will give us will be kept confidential and only used for the research purpose. The interview will take 25-30minutes.

So are you willing to participate in this study?

☐ Yes ☐ No

If the answer is yes, Thanks! Conduct!

If the answer is no, Go to the next house hold

I have read the information sheet and I understood the purpose and the expected benefit of the research of this study. I hereby need to assure with my signature that I have signed without any coercion & I have decided to participate voluntarily to take part my contribution to the study which will help in decreasing the prevalence and associating factors of malnutrition in under five children.

Signature _____

Date _____

In case you want to contact the investigator, please contact,

Arare Hordofa **0911715251**

Questionnaire code number _____ Date of interview _____

Name of the data collector _____ Signature _____

Name of the supervisor _____ Signature _____

Date of checking _____

Questionnaire for the study of the assessment and factors associated with malnutrition in children 6-59 months of age in Burayu Town, Oromia, Ethiopia from March to April, 2017.

Part one: Socio-demographic variables			
No	Question	Response	Remark
101	Head of the HH	1. Male 2. Female	
102	Marital status	1. Married 2. Divorced 3. Widowed 4. Separate 5. Single	
103	Total family size (How many person live in the HH?)	In number _____	
104	How many children <5 year live in the HH?	In number _____	
105	Maternal educational status	1. Illiterate 2. Read & write 3. Elementary 4. High school 5. College	
106	Paternal educational status	1. Illiterate 2. Read & write 3. Elementary 4. High school 5. College	
107	Occupation of mother	1. Housewife 2. Merchant\ Trade 3. Private organization employee	

		4.Government employee 5.Daily laborer 6.Other(specify)	
108	Occupation of father	1.Government employee 2.Merchant\ Trade 3.Private Org. employee 4.Daily laborer 5.Other (specify)	
109	Monthly income of the HH	_____ Birr	
110	Who decides how the money you earn will be used ?	1.Mainly wife 2.Mainly husband 3.Only husband 4.Both jointly 5.Both independently	
111	Who is the decision maker in the HH	_____	
112	Ethnicity	1. Oromo 2.Amara 3.Tigree 4. Gurage 5. Others (specify)	
113	What is your religion	1. . Orthodox 2 Protestant 3. Catholic 4. Muslim 5.Others(specify)	

Part two: Child characteristics

201	Child's sex	1. Male 2. Female	
202	Child's age	_____ Months	
203	Birth order	_____ th	
204	Place of delivery	1.Home 2.Health institution	

		3. Other (specify)	
205	Gestational age at birth	1. Less than 9 Months 2. At 9 months 3. Greater than 9 Months 4. Do not know /Not sure/	
206	Was your child weighed at birth?	1. Yes 2. No If yes _____ kg.	
207	Type of birth	1. Single 2. Multiple/Twin/	
208	Was it planned pregnancy	1. Yes 2. No	
209	Does the child ever been immunized ?	1. Yes 2. No	If no, skip to 313
210	Vaccines received (See card, if no card available ask them to recall) (More than one answer is possible)	1. BCG only (See Scar) 2. DPT (No of dose____) 3. Measles 4. No card found	
211	Vit. A supplementation in the past six months?	1. Yes 2. No 3. Don't know/not sure	
212	What is the frequent health problem of the child ?	1. _____ Disease/s 2. Don't know	
213	Has the child had diarrhea in the last two weeks?	1. Yes 2. No 3. Do not know/not sure	If no, skip to 317
214	How frequent the diarrhea in a year ?	1. Once 2. Twice 3. 3-4 times 4. >5 times	
215	Has the child been ill with fever at any time in the last two weeks?	1. Yes 2. No 3. Don't know/not sure	
216	Presence of respiratory disease in the last two weeks	1. Yes 2. No 3. Do not know/not sure	
217	Has the child get sick with measles in the last year	1. Yes 2. No 3. Do not know/not sure	

218	Presence of edema on the child (Observe)	1. Yes 2. No	
Part three: Child caring practice			
301	Did you ever breast fed the child (NAME)?	1. Yes 2. No	If ye, skip to 303
302	If no, reason for not breastfeeding?	Reason _____	
303	How long after birth did you first offer the child to breast feed?	1. Immediately 2. _____ Hours (If less than 24 hours record hour) 3. _____ Days 4. Don't know/not sure/	
304	Did you give the child pre-lactation food/fluid?	1. Yes 2. No	If no, skip to 406
305	If yes, what did you give him (her)?	1. Water 2. Butter 3. Milk 4. other (Specify)	
306	Did you squeeze out and throw the first milk (Cholestrum)?	1. Yes 2. No	
307	Are you still breastfeed?	1. Yes 2. No	If no, skip to 415
308	How many times did you breastfeed in the last 24 hours	_____ Times	
309	Do you breast feed in the night?	1. Yes 2. No	
310	Did you give the child additional food or fluid other than breast milk in the past 48 hours?	1. Yes 2. No	If no, skip to 422
311	If yes, what ingredients you gave? (More than one answer is possible)	1. Cow's milk 2. Butter 3. Sugar solution. 4. Formula milk. 5. Bula 6. Other (specify)	
312	How many times in 24 hours?	_____ times	
313	At what age did you start	_____ Months	

	feeding additional food?		
314	What do you use to feed the child	1. Bottle 2. Cup 3. Spoon 4. Other (specify)	
315	How many months did you breast-feed the child?	1. _____ Months 2. Don't know/not sure/	
316	For how many months did you exclusively breast-fed the child?	1. _____ Months 2. Don't know/not sure/	
317	Who is usually taking care of the baby feeding?	1. Mother 2. Sister 3. Grand mother 4. Servant 5. Other (specify)	
318	During the illness, has the child feeding practice changed?	1. Yes 2. No	If no, skip to 320
319	How could the practice changed?	1. preventing from breast 2. preventing from giving food 3. Providing additional food 4. Other (specify)	
320	Bath taking of the child	1. Daily 2. Weekly 3. Other (Specify)	
321	How frequent you wash the equipment you use to feed your child	1. Twice daily 2. Once daily 3. Every other day 4. Immediately after use 5. Other (specify)	
322	How do you usually treat your child when get sick	1. Usually home treatment 2. Taking to traditional healers 3. Taking to health institutions 4. Other (specify)	
323	Have you ever taken your child to health institution when get sick ?	1. Yes 2. No	
324	How many times have you ever taken your child to health	_____ times	

	institution getting sick ?		
Part four : Maternal characteristics			
401	Mother's age in years	Year completed_____	
402	Age at first birth	_____ Years	
403	Age when the youngest child was born or age at last birth	_____ Years	
404	Total number of children ever born?	In number _____	
405	Pre-pregnancy weight (of the last pregnancy)	1.In kilogram_____	
		2. Do not know/not sure/	
406	During pregnancy or lactation, did you consume extra food?	1. Yes 2. No	
407	Health status during the pregnancy	1. Good 2. Not good/sick	
408	Did you visited health facility for ANC	1. Yes 2. No	If no, skip to 511
409	At what months of the pregnancy you started ANC	1.At _____ months	
		2. Don't know/not sure	
410	How many times you visited health facility for ANC during the pregnancy?	_____ times	
411	Do you know about family planning?	1. Yes 2. No	If no, skip to 515
412	Have you ever used family planning methods	1. Yes 2. No	If no, skip to 515
413	Which method have you ever used? (More than one answer is possible)	1. Pills 2. Depo-Provera 3. Norplant 4. condom 5. other (Specify)	
414	Do you use it now?	1. Yes 2. No	
415	When do you usually wash your hands?(More than one answer is	1. After latrine use 2. Before preparing food	

	possible)	3. Before serving food 4. After cleaning child feaces 5. Other (specify)	
416	How do you wash your hand?	1. Using water only 2. Using soap some times 3. Using soap always 4. Using ash some times	
417	What do you think your child physically looks?	1. Thin 3. Tall 2. Heavy 4. Normal 3. Small	
418	For how long do you think should a child exclusively be breast-fed?	In months_____	

Part five: Environmental conditions

501	What is your main source of drinking water?	1. River 2. Pond 3. Private well 4. Public tap 5. private tap 6. Other (specify)	
502	Amount of water used in the household daily?	In liters_____	
503	How long does it take you to go and come back to fetch water?	In minutes_____	
504	Do you treat water in any way to make it safer?	1. Yes (Specify) 2. No	
505	Do you have latrine?	1. Yes 2. No	If no, skip to 607
506	Type of latrine you use? (Observation)	1.Private pit / wooden slab 2. Private slab / cement slab 3. Shared latrine/wooden slab	

		4. Shared VIP latrine 5. Other (Specify)	
507	How do you dispose garbage?	1. Open field disposal. 2. In a pit 3. Common pit 4. Composting 5. Burning 6. Other (specify)	
508	How many rooms for use by the member of your household? (Excluding kitchen and store)	_____ in Number	
509	Type of house floor (Observation)	1. Earth /Soil/ 2. Cement/Brick 3. Wooden/Bamboo 4. Ceramic 5. Other(Specify)	
510	Presence of windows (Observation)	1. Yes 2. No	
511	Do you have separate room which is used as Kitchen?	1. Yes 2. No	
512	What type of fuel do you mainly use for cooking?	1. Wood 2. Kerosene 3. Electricity 4. Animal dung 5. Other(specify)	

Part six: Anthropometrical measurement

- Child weight in kilogram _____
- Child height in centimeters _____
- MUAC measurement in centimeters _____
- Maternal weight in kilogram _____
- Maternal height in centimeters _____

ANNEX II; OROMIC VERSION QUESTIONNAIRES

YUNIVARSITII FINFINNEE DIPARTIMENTII NARSII FI MIIDWAAYIFERII, QORANNAA SADARKAA SIRNA NYAATA IJOOLEE JP'A 6-59 GIDDUU JIRAN

MAGAALAA BURRAYYUU, OROMIYAA, ETIYOOPHIYAA, 2017

Waraqaa Gaaffii

Waraqaan gaaffii kun kan qophaa'e ragaa sadarkaa sirna nyaata ijoolle fi dhimmoota murteessaa isaa ta'an sadarkaa mana manatti funaanuuf, Bulchiinsa Magaalaa Burraayyuu, Naannoo Oromiyaa, 2017.

Waliigaltee

Nagaa Seensa

Maqaan koo _____ jedhama. Ani kan hojjachaa jiru ragaa qorannaa Yunivarsitii Finfinnee, departimentii Narsii fi Midwiferii waliin ta'uun mata duree "Sadarkaa sirna nyaata ijoolle fi dhimmoota murteessaa isaa ta'an" irratti gageefamuuf oolu funaanuu dha. Maqaan keessan guca kana irrattii hin-bareefamu, akkasummas ragaa naa keenitan walin qabsifamees itti hin-fayyadamamu. Gaffiin isin deebisuu hin-barbanne yoo jiratee dhisuun mirga keessan ta'e yeroo barbaadanis gaffii fi debii gageesinu dhaabuu ni-dandeessu.

Haa ta'u malee, gaaffilee hundaaf deebiin sirrii ta'e kaayyoo qorannaa kanaaf bahe barbachisadha. Hirmaachuudhaaf fedhii qabduu?

Gaaffii fi deebii kana xumuruuf sa'aa _____ ta'u nutti ni-fudhata.

Mallattoo gaafaataa, Namni gaafatamu kun waligaltee isaa jechaan ibsu isaa mirkaneessuuf _____

001. Lakkoofta waraqaa gaaffii / _____ / _____ /

002. Maqaa nama gaafatuu _____ Mallattoo _____

003. Guyyaa gaffii fi deebii _____

004. Teesso; 005. Farii: 1. Hundi guutame 2. Walakkaa guutame 3. kan biraa (Ibsi)

To'ata hordofe; Maqaa _____, Mallattoo _____

Qorannaa sadarkaa sirna nyaata ijoollee ji'a 6-59 gidduu jiran Magaalaa bulchiinsa Burrayyuutti kan argaman, 2017.

<u>Kutaa 1ffaa: Gaaffilee Hawaasummaa fi Diinagdee</u>			
<u>Lakk</u>	Gaaffii	Deebii	Darbuu/ Ibsa
101	Abbaan manaa	1.Dhiira 2.Dubartii	
102	Haalli fuudhaa	1.Waliin jiru 2.Wal hiikan 3.Irraa du'e 4.Addaan bahan 5.Kophaa	
103	Baayyina maatii mana keessa jiraatanii	_____lakkoo fsaan	
104	Baayyinni ijoollee waggaa <5 mana keessa jiranii	_____lakkoo fsaan	
105	Haala Barumsa haadha manaa	1.Kan hinbaranne 2.Barreesuu fi dubbisuu danda'uu 3.Barumsa sadarkaa 1 ffa 4.Barumsa sadarkaa 2 ffaa 5.Colleejii	
106	Haala Barumsa abbaa manaa	1.Kan hinbaranne 2.Barreesuu fi dubbisuu danda'uu 3.Barumsa sadarkaa 1 ffa 4.Barumsa sadarkaa 2 ffaa 5.Colleejii	
107	Jiruun haadha manaa	1.Haadha manaa 2.Daldaltuu 3.Hojjetaa jarmiyaa dhuunfaa 4.Hojjetaa mootummaa 5.Hojjetaa guyyaa 6.Kan biraa(Ibsi)	

108	Jiruun abbaa manaa	1.Hojjetaa mootummaa 2.Daldalaa 3.Hojjetaa jaar Miyaa dhuunfaa 4.Hojjetaa guyyaa 5.Kan biraa(Ibsi)	
109	Ji'aan galiin manaa meeqa ta'a?	Qarshii_____	
110	Itti fayyadama maallaqaa argattani irratti eenyu murteessa?	1.Caalmaan haadha mana 2.Caalmaan abbaa manaa 3.Abbaa manaa qofa 4.Lammanuu waliin tahuun	
111	Dhimma mana keessaa ilaalchisee murtoo kan kennu eenyu?	_____	
112	Qomoon keessan maali?	1.Oromoo 2.Amaara 3.Tigree 4.Guraagee 5.Kan biraa(Ibsi)	
113	Amantiin keessan maali?	1.Ortodoksii 2.Protestaantii 3.Kaatolikii 4.Musiliima 5.Kan biraa(Ibsi)	
Kutaa Lammaffaa Haala Mucaa			
201	Saalli mucaa maali?	1.Dhiira 2.Durba	
202	Umuriin isaa/ ishee meeqa?	Jiaan_____	
203	Mucaan meeqaffaatti deessan	Jiaan_____	
204	Bakki itti deessan eessa ?	1.Mana jireenyaa 2.Mana yaalaa 3.Kan biraa(Ibsi)	
205	Jia meeqaffaatti dhalate?	1.Jia sagalii gadi 2.Jia salgaaffaatti 3.Jia sagalii ol 4.Hibeekamu	
206	Yammuu dhalate ulfinni isaa/ ishee madaalameeraa?	1.Eeyyee 2. Lakki Yoo eeyyee tahe kg_____	
207	Gosni dhalootaa	1.Baaqqee 2.Lkkuu	
208	Mucaa dahuun karooraan	1.Eeyye 2.Lakkii	

	turee?		
209	Talaallii fudhatee/ttee beekaa/beektii?	1.Eeyyee 2. Lakkii	Yoo hinfudhanne
210	Talaallii kam fudhate?(Kaardii ilaali,yoo hinjirre akka yaadatan gaafadhu) (Deebiin tokkoo oli nidandahama)	1.BCG qofa (mallattoo ilaali) 2.DPT(lakoo fsa doozii____) 3.Gifira 4.Caardiin hinjiru	
211	Vit. A jia jaha darbe keessatti fudhatee/ttee?	1.Eeyyee 2. Lakkii 3.Hinbeekamu	
212	Rkkoon fayyaa mucaa yeroo hedduu maali?	1.Dhukkuba _____ 2.Dont know	
213	Torban lamaan darbe keessa mucaan dhukkuba garaa kaasaa qabaa /qabdii?	1.Qaba 2.Hinqabu 3.Hinbeekamu	Yoo hinqabne
214	Waggaatti yeroo meeqa garaa kaasaan qabeen?	1.Tokko 2.Lama 3.Yeroo 3-4 4. 5>ol	
215	Torban lamaan darbe keessa mucaan dhukkuba gubaa qabaa/qabdii?	1.Eeyyee 2.Lakkii 3.Hinbeekamu	
216	Torban lamaan darbe keessa dhukkuba afuuraa ykn sombaa qabaa/qabdii?	1.Qaba 2. Hin qabu 3. Hinbeekamu	
217	Waggaa darbe keessa dhukkuba gifiraatiin qabamee beekaa/beektii?	1.Qaba 2. Hinqabu 3.Hinbeekamu	
218	Dhiitoo miilla gadii irraa qabaa/qabdii?(Ilaali)	1. Qaba 2.Hinqabu	

Kutaa sadaffaa :Haala Kunuunsa Mucaa			
301	Mucaa keessan harma hoosiftanii beektuu ?	1.Eeyyee 2. Lakki	
302	Yoo hinhoosifne sababisaa maali?	Sababa _____	
303	Mucaan dhalatee/ttee hagam turtanii harma hoosisuu eegaltan?	1.Akkuma dhalateen 2.Sa'a _____ booda 3.Guyyaa _____ booda 4.Hinbeekamu	
304	Akkuma deessaniin nyaanni/dhangala'aan mucaaf kennitan jiraa?	1.Eeyyee 2.Lakki	
305	Yoo eeyyee,ta'e maal kennitaniif?	1.Bishaan 2.Dhadhaa 3.Aannan 4.Kan biraa(Ibsi)	
306	Aannaan harmaa kan jalqabaa(silga) elmitanii gattanii?	1.Eeyyee 2.Lkki	
307	Hanga ammaatti hoosisaa jirtuu?	1.Eeyyee 2.Lakki	
308	Sa'a 24 darbetti yeroo meeqa hoosiftan?	Yeroo _____	
309	Halkan ni hoosistuu?	1.Eeyyee 2.Lkki	
310	Mucaan nyaata biraa /dhangala'aa sa'a 24 darbe keessatti fudhateeraa/tti?	1.Eeyyee 2.Lkki	
311	Yoo fudhate/tte ,nyaata akkamii? (Deebiin tokkoo ol ni danda'ama)	1.Aannaan loonii 2.Dhadhaa 3.Saa'ii 3.Aannan bittaa(formulaa) 4.Mooqa(bullaa) 5.Kan biraa(ibs)	
312	Sa'a 24 tti yeroo meeqa fudhate/fudhatte?	Yeroo _____	
313	Umurii meeqatti nyaata dabalataa laachuufii eegaltan?	Ji'a _____	

314	Mucaa nyaachisuuf meeshaa akkamii fayyadamtuu?	1.Buttullee 2.Siinii 3.Maankaa 4.Kan biraa(ibsi)	
315	Hanga umurii meeqaatti harma hoosistan?	1.ji'a _____ 2.Hin yaadadhu	
316	Harma qofa hanga umurii meeqaatti hoosistan?	1.Ji'a _____ 2.Hin yaadadhu	
317	Mucaa nyaachisuu yeroo hedduu eenyutu hordofaa ?	1.Haadha 2.Obboleettii 3.Akkawoo 3.Hojjettuu manaa 4.Kan biraa(ibsi)	
318	Yeroo dhukkubaa haalli mucaa itii nyaachistan ni jijjiiramaa?	1.Eeyyee 2.Lakki	
319	Haalli nyaachisuu akkamitti jijjiiramaa?	1.Harma hoosisuu dhaabuun 2.Nyaata kennuufii dhaabuun 3.Nyaata dabalataa kennuun 4.Kan biraa(ibsi)	
320	Yeroo meeqatti meeshaa nyaataa kan mucaa dhiqxu ?	1.Guyyaatti yeroo lama 2.Guyyaa guyyaatti 3.Guyyaa lammaffaatti 4.Akkuman nyaachisen 5Kan biraa(ibsi)	
321	Yeroo meeqatti qaama mucaa dhiqxu?	1.Guyyaa guyyaatti 2.Torbanitti 3.Kan biraa(ibsi)	
322	Yeroo mucaan dhukkubsatu /ttu akkamitti yaalchiftu?	1.Yeroo hedduu manumatti 2.Yaaltota aadaa biratti 3.Dhaba fayyaa geessuun 4.Kan biraa(ibsi)	
323	Kanaan dura mucaa keessan yaaliidhaaf dhaaba fayyaa geesitanii beektuu?	1.Eeyyee 2.Lakki	
324	Yeroo meeqa mucaan dhukkubsatee/tee dhaaba fayya geesitanii beektu ?	1.Yeroo _____ 2.Hin yaadadhu	

Kutaa Arfaffaa Haala : Haala Haadhaa			
401	Umuriin haadhaa meeqa?	Waggaa_____	
402	Umurii mucaa isa jalqabaa itti deessan	Waggaa_____	
403	Umurii mucaa isa dhumaa itti deessan	Waggaa_____	
404	Baayyina ijoollee dhalattee	Ijoollee_____	
405	Ulfinni garaatti bachuu kessaniin dura qabdan meeqa ture?(mucaa isa qoratamuu)	Kiiloo graama_____	
406	Yeroo garaatti baattan / hoosistan (mucaa isa qoratamuu)nyata dabalataa (addaa) nyaattanii?	1.Eeyyee 2. Lakki	
407	Haalli fayyaa keessanii yeroo garaatti baattan akkam ture?	1.Gaarii ture 2.Gaarii hin turre(ibsi)	
408	Dhaabata fayyaa qorannaa dahumsa duraa tiif ni deemtu turee?	1.Eeyyee 2. Lakki	
409	Garaatti baattanii ji'a meeqaffaatti qorannaa dahumsaa duraa tiif dhaaba fayyaa deemuu eegaltan?	Ji'a _____tti	
410	Yeroo meeqa QDD tiif dhaaba fayyaa deemtaniittu?	1.Yeroo_____	
		2.Hinbeeku	
411	Waa'ee karoora maatii beektuu?	1.Eyyee 2. Lakki	
412	Tooftaalee karoora maatiitti fayyadamtanii beektuu?	1.Eeyyee 2. Lakki	
413	Tooftaa kamitti fayyadamtanii beektu?	1.Kiniinii/pills 2.Diippoo 3.Norplant 4.Koondomii 5.Kan biraa(ibsi)	
4514	Yeroo ammaa itti fayyadamaa jirtuu?	1.Eeyyee 2.Lakki	
415	Harka keessan yeroo kami dhiqattu? (yeroo hedduu)	1.Mana fincaanii booda 2.Nyaata qophessuun dura	

	(Deebiin tokkoo ol nidanda'ama)	3.Nyaata dhiyeessuun dura 4.Bobbaa ijoollee erga qulleessanii booda 5.Kan biraa(ibsi)	
416	Akkamiin(maaliin) dhiqattu?	1.Bishaan qofaan 2.Saamunaa wajjin darbee 3.Yeroo hunda saamunaadhaan 4.Daaraa wajjin al tokko tokko	
417	Mucaan keessan qaamaan (guddinni)isaa maal isinitti fakkaata	1.Qal'aa 2.Furdaa 3.Xiqqaa 4.Dheeraa 5.Giddugaleessa	
418	Hanga umurii meeqaatti mucaan harma qofa argachuu qaba jettanii yaaddu?	1.Ji'a _____tti 2.Hinbeeku	
Kutaa Shanaffaa : Haala Naannoo			
501	Maddi bishaan dhugaatii keessan ?	1.Laga 2. Haroo 3.Biirii dhuunfaa 4 .Boonoo uummataa 5.Boonoo dhunfaa 6.Kan biraa(ibsi)	
502	Guyyaatti baayyina bishaan itti fayyadamtani meeqa	Liitra _____	
503	Yammuu bishaan waraabdan deemanii deebi'uuf yeroo hammamii isinitti fudhata?	Daqiiqaa _____ni fudhata	
504	Bishaan itti fayyadamtan qulqulleessuuf yaaliin gootan jiraa?	1.Eeyyee(ibsi) 2.Lakki	
505	Mana fincaanii ni qabduu?	1.Eeyyee 2. Lakki	
506	Gosni mana fincaanii itti gargaaramtanii (ilaali)	1.Boolla dhuunfaa kan qadaadoo qabu	

		2.Boolla dhuunfaaa kan simmintoo 3.Boolla waliinii kan qadaadoo mukaa 4.Boolla waliini simmintoo 5.'VIP' kan dhuunfaa	
507	Haalli kosii qooraa itti gattan akkam?	1.Bakkeetti 2.Boolla dhuunfatti 3.Boolla waliiniitti 4. 'compost' gochuu 5.Gubuu 6.Kan biraa(ibsi)	
508	Kutaan manaa meeqa?(mana ittoo fi kuusaa meeshaan alatti)	Kutaa_____	
509	Lafti mana jireenyaa maalirraa hojjetame?(ilaali)	1.Biyyoo 2.Simintoo(Brick) 3.Muka(Baambuu) 4.Seeraamikii 5.Kan biraa(ibsi)	
510	Manni jireenyaa foddaa qabaa?(ilaali)	1.Eeyyee 2.Lakki	
511	Mana nyaata itti bilcheesitan kophaatti jiraa?	1.Eeyyee 2.Lakki	
512	Nyaata bilcheessuuf maalitti fayyadamtuu ?	1.Muka 2.Keerosinii 3.Elektrika 4.Kaboota 5.Kan biraa(ibsi)	

Kutaa Ja'affaa Madaala Qaamaa

- Ulfinni mucaa kiilograamaan_____
- Dheerinni mucaa seentiimetraan_____
- Madaalliin 'MUAC' kan mucaa seentiimetraan_____
- Ulfinni haadhaa kiilograamaan_____
- Dheerinni haadhaa seentiimetraan_____

ASSURANCE OF PRINCIPAL INVESTIGATOR

The undersigned agrees to accept responsibility for the scientific ethical and technical Conduct of the research project and for provision of required progress reports as per terms and conditions of the Research Publications Office in effect at the time of Grant is forwarded as the result of this application.

Place- Addis Ababa University, College of Health Sciences, Department of Nursing and Midwifery

Addis Ababa

Ethiopia, 2017

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Date. _____ Signature _____

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Name of the co-advisor: Erdaw Tachbele

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Date _____ Signature _____