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Undernutrition and Associated Factors among Children Attending Anti Retroviral Therapy in Public Hospitals of Eastern Ethiopia

MPH Thesis

Betelihem H/Selassie (BSc)

September, 2018

Haramaya University, Harar

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APPROVAL SHEET
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ACRONYM AND ABBREVIATION

AIDS	Acquired Immune Deficiency Syndrome
AM	Acute Malnutrition
AOR	Adjusted Odds Ratio
ART	Anti Retroviral Therapy
BMI	Body Mass Index
CI	Confidence Interval
HFIAS	Household Food Insecurity Access Scale
HIV	Human Immunodeficiency Virus
PLHIV	People Living with Human Immunodeficiency Virus
SD	Standard Deviation
SPSS	Statistical Package for Social Science
WHO	World Health Organization

ABSTRACT

Background: Undernutrition results from insufficient food intake and repeated infectious diseases. Human Immunodeficiency Virus infection and malnutrition often coexist which increase the risk morbidity and mortality. Despite of this fact, Human Immunodeficiency Virus infected children are often overlooked and their nutritional status has not been well studied in low income countries like Ethiopia.

Objective: The aim of this study was to determine the magnitude of undernutrtion and associated factors among pediatrics age attending anti retroviral therapy in selected public hospitals of eastern Ethiopia.

Methods: An institutional based cross sectional study was used to conduct this study. A sample of 376 Human Immunodeficiency Virus infected children aged 2-15 years were selected through probability proportional sampling technique. Pre-tested questionnaire was used. The collected data were coded and entered into EPI data version 3.1, cleaned and exported to SPSS version 20.0 for analysis. The World Health Organization Anthros and Anthros plus 2010 software were used to calculate the anthropometric indices. Descriptive statistics, bivariable and mutivariable logistic regression analysis was applied. Variables associated with the outcome variables at p-value <0.05 was considered as statistically significant.

Result: The magnitude of stunting (HAZ<-2SD) and thinness (BMI for age<-2SD) was found to be 24.7% (95%CI: 20.7, 29.4) and 28.2% (95%CI: 23.7, 32.2), respectively. Household food insecurity [AOR=5.08, 95% CI (2.29, 11.26)], being anemic [AOR=1.8, 95%CI (1.02, 3.19)], presence of Diarrhea [AOR=2.13, 95%CI (1.18, 3.84)] and advanced WHO clinical stage [AOR=2.51, 95% CI (1.18, 5.34)] were significantly associated with stunting. While being male [AOR=2.53, 95% CI (1.43, 4.45)], low family monthly income [AOR=3.12, 95%CI(1.15, 8.5)] and medium family monthly income [AOR=2.25, 95%CI(1, 5.04)], low dietary diversity [AOR=2.77, 95%CI (1.44,5.31)], low (poor and borderline) food consumption pattern[AOR=2.49, 95%CI(1.31,4.74)] and presence of diarrhea [AOR=3.26, 95% CI (1.81,5.87)] were significantly associated with thinness.

Conclusion and recommendation: There was medium and high magnitude of stunting, thinness in this study. Therefore, health education should be given regarding dietary practice to improve their nutritional status.

Key words: Pediatric age, ART, Undernutrition, Eastern Ethiopia

1. INTRODUCTION

1.1 Background

Undernutrition is defined as pathological state resulting from of insufficient food intake (hunger) and repeated infectious diseases. This includes under weight, stunting, wasting and micronutrient deficiency (Liu *et al*, 2015). Human Immunodeficiency Virus increases the risk of malnutrition. HIV is one of the greatest challenges to global health. HIV infection is particularly aggressive in children when there is no access to treatment, more than half of HIV-infected infants die before the age of two years, with a median survival of only 23 months (Brahmbhatt *et al*, 2006).

HIV infection and malnutrition often coexist. HIV impairs nutritional status by undermining the immune system, as well as nutrient intake, absorption and use. Malnutrition can exacerbate the effects of HIV and hasten AIDS-related illnesses in people living with HIV, Weight loss and under nutrition among children living with HIV/AIDS increases the risk morbidity and mortality (Callens *et al*, 2009).Even if the introduction of highly active antiretroviral therapy raised hope, its effect remains insufficient, thus the need for nutritional support in HIV-infected child care. (Chinkhumba *et al*, 2008; Weigel *et al*, 2010). As a result of this, HIV-positive children have greater nutritional needs compared with HIV-negative counterparts, to ensure normal growth and development. Calorie intake needs to be increased up to 150% of the recommended daily allowance of calories, and micronutrient requirement is up to five times that of an HIV-negative child. HIV-positive children with chronic lung disease, chronic TB or chronic diarrhea require approximately 20–30% increased calorie intake (WHO, 2009).

Nutritional intervention is critically recommended to focus on children up to two years in order to bring effective change and break the generational cycle of malnutrition. This is due to the fact that most of the irreversible damage due to malnutrition occurs during gestation and in the first 24 months of life, hence underscores the importance of intervening in this period (Lancet, 2013).The determinant of child nutrition consists of dietary, behavioral, and health. These are affected by underlying food security, care giving resources, and environmental conditions, which are in turn shaped by economic and social conditions, national and global contexts, capacity, resources, and governance (Black *et al*, 2013).

1.2 Statement of Problem

Human Immunodeficiency Virus infected Children are more vulnerable to malnutrition. Globally, 36.9 million people are living with HIV and AIDS of which, 3.2 million are children under 15 years, 220,000 children were newly infected and 32 percent of children in need of treatment had access to antiretroviral treatment. Approximately 70% live in Africa where food insecurity and under nutrition are endemic. Besides, nearly one third (32%) of children in need of treatment had access to antiretroviral treatment. Lack of access to ART and food security increases the risk for malnutrition (UNAIDS, 2015).

Though there are few reports on undernutrition of HIV infected children, it is generally understood that the burden is high compared to the general population of children. Most of the HIV infected lives in resource poor countries of Africa and Asia where food insecurity is widespread (Louise*et al,* 2009*).*

Among HIV-Infected Asian Children staring ART, 11.9% had severe malnutrition (Boettiger *et al,* 2016) and the prevalence of under nutrition in Asian countries has been reported to range from 17-63% (Shah *et al,*2005, Merchantet *et al,* 2001, Lodha *et al,* 2005, Shet *et al,* 2009, padmapriyadarsini *et al,* 2009). In west and central Africa regions, the prevalence of malnutrition among HIV-infected children is 42% (Jesson *et al,* 2015). Demographic health survey in African countries stated that the highest proportion of children under nutrition among children whose mothers are infected with HIV. The proportion of stunted under five children who had HIV positive mothers ranges from the highest in Ethiopia (51.7%), Burkina Faso (45.2%), Guinea (45.8%), Malawi(46.2%), Lesotho (42.5%) to lowest in Sierra Leone (19.2%) (Magadi *et al,* 2011).

The effects of undernutrition and HIV can be seen when either of them is present and when both co-exist. Generally, the consequences can be viewed as health, neuron developmental and economic. (Geissler *et al,* 2006). HIV-positive children with severe acute malnutrition are at higher risk of infectious co-morbidities (such as tuberculosis, respiratory tract infections and gastroenteritis) and other complications (such as persistent diarrhea and poor oral intake. Particularly pneumonia and tuberculosis, which are also very common in HIV-positive children, have been found to contribute to the increased risk of malnutrition in children in several lower-income countries. This establishes a vicious infection-malnutrition cycle (Schlaudecker*et al,* 2011).

Evidence report that HIV-infected children have a higher risk of growth faltering and stunting, which can cause long term irreversible and detrimental cognitive, motor and health impairments(Van Rie *et al,* 2008).Similarly, stunting results in delayed mental development, poor school performance, and reduced intellectual capacity, which leads to lower income and lower economic productivity at a national level. For instance, malnutrition reduces human productivity by 10-15% and gross domestic product by 5-10% (Shekar *et al,* 2016).

Different studies identify risk factors for malnutrition among HIV infected children such as child level characteristics (child's age and sex, birth order, multiple/twin birth, birth interval, breastfeeding duration and size of child at birth); maternal characteristics (i.e. mother's age, educational attainment and single parenthood); household and residence (household wealth index, orphan hood and urban/rural residence); and contextual community level factors relating to HIV prevalence (Magadi *et al,* 2011).

Ethiopia has prioritized nutrition as critical component of HIV treatment, care, and support by setting guideline and implementation manual in place (FMOH, 2008).Due to scarcity of data and limited awareness of HIV infection in older children, the HIV epidemic among Ethiopian children appears neglected in national programs as children ART coverage is only 12% in 2013. It is estimated the population of HIV-positive children under 15 years old to be 160,000 in 2013. To increase their chances of survival, the remaining 88% children need therapeutic combined with antiretroviral treatment (Pegurri, 2015). The majority of nutrition policies and interventions in developing countries target pregnant and lactating women and children up to two years. Despite of this fact, HIV infected children are often overlooked and their nutritional status has not been well studied. Therefore, the aim of the study is to assess magnitude of undernutrition and its factors among HIV infected children in Eastern Ethiopia.

1.3 Significance of the Study

This study is primarily intended to provide baseline information on the magnitude and associated factors of under nutrition among HIV infected children. The finding will recommend programmatic interventions for Regional Health bureaus (Somali, Harar and Dire Dawa) and stakeholders to work collaboratively and intervene on nutritional challenges HIV positive children. Moreover, this study will serve as an input for subsequent studies in the study area.

1.4 Objective

1. 4.1 General objective

- ✓ To determine the magnitude of Undernutrtion and Associated Factors among children Attending Anti Retroviral Therapy at Public Hospitals of Eastern Ethiopia, 2018.

1.4.2. Specific objectives

- ✓ To determine the magnitude undernutrition among children Attending Anti Retroviral Therapy at Public Hospitals of Eastern Ethiopia.
- ✓ To identify factors associated with undernutrition among children Attending Anti Retroviral Therapy at Public Hospitals of Eastern Ethiopia.

2. LITERATURE REVIEW

2.1 Undernutrition among Pediatric Age Group Living With HIV/AIDS

Different studies from Asian countries show higher proportion of stunting and thinness among HIV positive children. A study in Malaysia on nutritional status of children living with HIV and receiving antiretroviral medication found that 20.8% were stunted (Mohd *et al,* 2011). A study in India found that the prevalence of stunting was 56.8% (Chandraiah *et al,* 2015). A study in South India indicated that the prevalence of malnutrition in HIV positive children is high evident by stunting 58% (Padmapriyadarsini *et al,* 2009).A study in North India among HIV- infected showed that stunting was 69.8% (Rakholia *et al,* 2016).A study from Central India among less than fifteen years HIV-positive children showed that the prevalence of stunting and thinness was 60.3% and 20.6%, respectively (Ambey *et al,* 2015). A study in India revealed that the proportion of stunted children is found to be 46% (Shet *et al,* 2009).

A study from West Bengal in India found that the prevalence of stunting was 44.6% (Chattopadhyay et al, 2016). A study among HIV-positive children aged between year and half and 15 years in India showed that 59.7% children were stunted and 19.5% had low BMI for age (Swetha *et al,* 2015). Another study from India found that prevalence of thinness and stunting among HIV positive children was 29.2% and 55%, respectively (Das *et al,* 2017).

A study from Latin America, El Salvador among HIV-infected population of children and adolescents on antiretroviral treatment found that proportion of stunting was 33.2% (Martı´n-Cañavate*et al,* 2018).

Many studies from Southern and Western and Central Africa regions demonstrated the prevalence of high under nutrition among HIV positive children. A study in West and Central Africa found that the prevalence of chronic malnutrition was 26% (Jesson *et al,* 2015).A study in Cameroon revealed that among the infected children 51.3% were stunted (Chiabi *et al,* 2012).A Hospital based study in Côte d'Ivoire among HIV infected children (less than 15years) found that the prevalence of chronic malnutrition was 25.5% (Folquet *et al,* 2015).A study in Nigeria among children (aged less than seventeen years) orphaned from HIV/AIDS indicated that stunting was 67.9% (Ifitezue*et al,* 2015).A study in Nigeria among orphan and non-orphan HIV infected children found that proportion of stunting was 46.8% (Oladokun *et al,* 2009).

A retrospective study from Nigeria found that the prevalence of stunting was 54.4% (Anigilaje *et al,* 2015).

A study among pediatric AIDS patients in a Tertiary Centre in Nigeria indicated that the prevalence of thinness and stunting in HIV- positive children were 24.7% and 33.7%, respectively (Anyanwu *et al*, 2016).A study from Lagos in Nigeria showed that the prevalence of stunting was 17.1% (Akintan *et al,* 2015). A Hospital based study in Nigeria indicated that the prevalence of stunting among HIV infected children was 48.6% (Anyabolu*et al*, 2014).

Nutritional status of perinatally HIV-infected children on antiretroviral therapy from a resource-poor rural South African community found that the prevalence of stunting particularly was high (36.2%) (Lentoor,2018). A study in Burkina Faso found that prevalence of stunting was 65% in HIV-infected children less than 5 years of age (Poda*et al,* 2017). A study from Namibia showed that the prevalence of stunting was 52.3% (Zingwari *et al,* 2010). A study in Malawi among children aged less than 15 years who started ART found that the proportion of stunting was 69% (Weigel et al, 2010).A study in Mozambique among HIV infected children under 15 years of age attending outpatient clinic indicated that stunting was found to be 57.4 % (Maura *et al*, 2015).

A study in Uganda revealed that 23% of the children below five years of age were stunted (Bukusuba *et al,* 2009). In study conducted among children less than 15 years attending HIV care services in Uganda, the prevalence of stunting and thinness was 36.2% and 18%, respectively (Francis *et al,* 2015). A population based study in Uganda indicates that the prevalence of stunting in HIV-positive children was 68% (Nalwoga *et al,* 2010).

The Eastern region of Africa is not peculiar as different studies indicate similar pattern of under nutrition among HIV positive children. A study in Tanzania among HIV positive children aged 6 months up to 14 years showed that stunting and thinness were prevalent among 61.9% and 21.1% of HIV-positive children, respectively (Sunguya *et al,* 2014). A study from Western Kenya revealed that children in HIV-affected households had a significantly higher degree of stunting which is 25.5% (Ndirangu *et al,* 2011). A study among HIV infected orphans in Kenya found that the prevalence of stunted was 31.2% (Berger *et al*, 2008). A study in among children from HIV/AIDS affected households in Kiambu Municipality in Kenya found that 24% were stunted (Gitika, 2014).

Studies conducted in central, southern, eastern and northern parts of Ethiopia have indicated similar finding of undernutriton among HIV positive children. The burden of malnutrition on HIV infected children in hospital based study in Ethiopia illustrated that 55.6% of the children were stunted (Bineyam *et al,* 2010).In cross-sectional study done in Felege Hiwot and Gondar referral hospitals among HIV-Positive children aged 6 months to 14 years, the overall prevalence of malnutrition was 42.9%, with 10.3% severe malnutrition. In under-five children the prevalence of stunting was 65% (Berihun *et al,* 2011). A study in public hospitals of Addis Ababa City indicated that the prevalence of stunting among HIV positive children was 62.1% (Atnafu, 2014).

A study in Addis Ababa among HIV infected pre-school children indicated that the magnitude of stunting was 71.3% (Tekleab *et al,* 2016). Assessment of nutritional status of adolescents living with HIV receiving care at public hospitals in AddisAbaba, showed that prevalence of stunting and thinness was 37.4% and15.6%, respectively (Birra, 2017). A study from Hawassa found that prevalence of stunting to be 60.5% (Wude, 2014). A study in Harar found that 49.1% of children were stunted (Teklemariam *et al,* 2015). A study from Harar showed that among total children, 8.3% were stunted (Hussen, 2017). A study on under nutrition among Pediatric Age (5-15 year) patients living with HIV/AIDS in Harari Region and Dire Dawa city public hospitals showed that the prevalence of thinness and stunting was found to be 11.6%and 30.9%, respectively (Dawit, 2017). However, even though all the study mentioned in above refers to pediatric age group but they did not really show the exact age group.

2.2 Factors Associated With Undernutrition among Pediatric Age Group Living With HIV/AIDS

2.2.1 Socio-Economic and Demographic Factors

A study in among children from HIV/AIDS affected households in Kiambu Municipality found that older children were stunted than younger ones (Gitika, 2014). A meta-analysis of demographic health survey of African countries showed that children aged four years were less likely to be stunted (Magadi*et al,* 2011). A meta-analysis of African countries showed that single parenthood was associated with more likelihood of stunting (Magadi*et al,* 2011).

A study in West and Central Africa found that malnutrition was associated with male gender (Jesson *et al,* 2015). A meta-analysis of African countries showed that being female was

protective for stunting (Magadi*et al,* 2011). Study in Uganda indicated that males were more likely to be stunted (Francis *et al,* 2015). A meta-analysis of demographic health survey of African countries showed that children from richest family were less likely to be stunted (Magadi*et al,* 2011). A meta-analysis of African countries showed that secondary level of maternal education was protective factor for stunting (Magadi*et al,* 2011). A meta-analysis of African countries showed that rural residence was determinant for stunting (Magadi*et al,* 2011).). Study in Uganda indicated that rural resident children were more likely to be stunted (Francis *et al,* 2015).

A study in Harar showed that malnutrition was higher among children aged 24-35 month and significantly high rate of malnutrition among female (Hussen, 2017). A study in Hawassa indicated that stunting was prevalent among families with low income level (Wude, 2014). A study on under nutrition among pediatric age (5-15 year) patients living with HIV/AIDS in Harari Region and Dire Dawa city public hospitals showed that family monthly income (≤500ETB) was determinant of thinness and stunting (Dawit, 2017). A study in Harari Region and Dire Dawa city public hospitals showed rural residence was significantly associated with stunting (Dawit, 2017).

2.2.2 Child feeding practice

Reliable evidences confirm that food insecurity, defined as persistent lack of access to adequate food in needed quantity and quality, under nutrition and HIV/AIDS are overlapping and have additive effects (Ivers *et al*, 2009). Diets consumed by children and adolescents are limited in diversity and meal patterns are inappropriate, consequently interfering with the distribution of nutrients over the day. That means there is a low energy intake and insufficient micronutrient intake (Ochola *et al*, 2014).

A study on nutritional status of adolescents living with HIV receiving care at public hospitals in Addis Ababa showed that nutrition counseling and moderately household food insecurity was determinants of thinness (Birra, 2017). A study in Harari Region and Dire Dawa city public hospitals showed that lack of dietary counseling, household food insecurity and low dietary diversity scale were significantly associated with thinness (Dawit, 2017).

2.2.3 Child health status

A study in West and Central Africa found that malnutrition was associated with severe immunodeficiency and recent ART initiation (< 6 months) (Jesson *et al*, 2015).

Study conducted in Thailand indicated that malnutrition was significantly associated with severity of HIV/AIDS (WHO stages 3 and 4) (Moolasart *et al*, 2017). Moreover, study among HIV-Infected Children Followed up in the Pediatric Unit of CNHU-HKM in Cotonou found malnutrition was associated with WHO clinical stage. This can be clinically explained as Co-infections with HIV are particularly problematic for those in more advanced stage of disease. As the immune system is weakened, individuals become more susceptible to other infections and make them susceptible to under nutrition (Adedemy *et al*, 2016).

A study in Harari Region and Dire Dawa city public hospitals showed having fair adherence to antiretroviral drug was significantly associated with thinness and the presence of diarrhea and being anemic were significantly associated with stunting (Dawit, 2017). However, the gap on the above mentioned studies was they did not include enough variables regarding to dietary practice and child health status.

2.3 Conceptual framework

This conceptual framework on the causes of malnutrition was adopted from the UNICEF nutrition strategy. The framework shows that causes of malnutrition are classified as immediate, underlying, and basic, whereby factors at one level influence other levels.

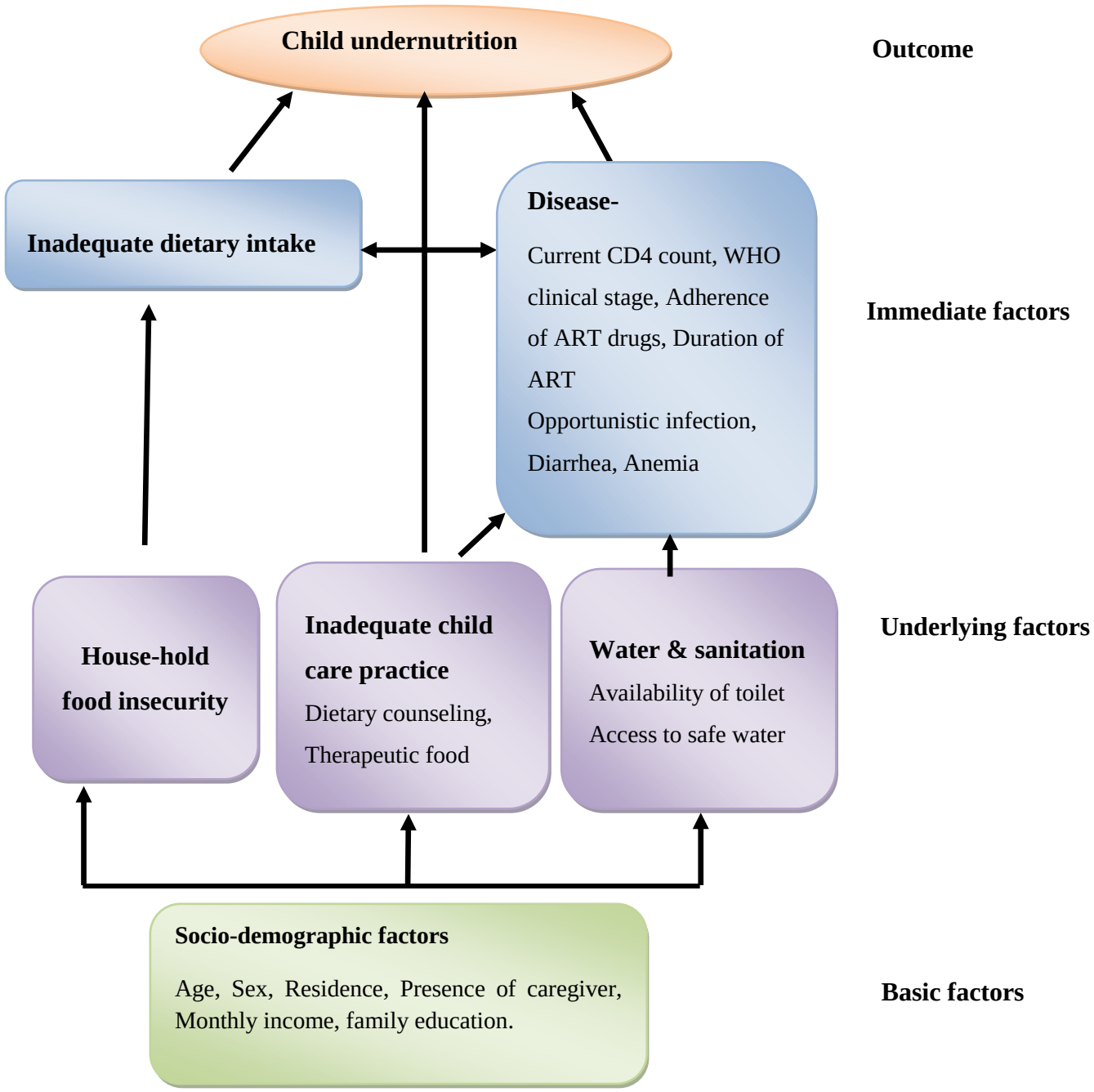

Figure -1 Conceptual framework Adapted from UNICEF conceptual framework of malnutrition and modified (UNICEF, 1999).

3. METHODS AND MATERIALS

3.1. Study Area and Period

The study was carried out in public hospitals found in Jigjiga, Dire Dawa and Harari which are found in eastern part of Ethiopia, and around 620, 526 and 515-kilo meters respectively far from Addis Ababa. Harari region have a total population of 99,368, Jigjiga city is 125876 and in Dire Dawa city is 233,224 out of this 116,232 are male and 116,992 are female. Harari and Afan Oromo languages are official languages in Harari region in other way Afan Oromo and Somalia are the working languages in Dire Dawa city administration.(CSA, 2007) In Harar region, there are two public hospitals namely, Hiwot Fana specialized university hospital and Jugala Hospital (HRHB,2016). Similarly, in Dire Dawa city administration, there are two public hospitals namely, Dile Chora Hospital and Sabian hospital (DDHB, 2016). In Jigjiga, there are two public Hospitals (JJHB, 2017). Currently there are a total of 895 children aged 2-15 years who are attending ART clinic in the sampled Hospitals (HRHB,2016,DDHB, 2016,JJHB,2017).The study was conducted from 11th February - 12thMarch, 2018.

3.2 Study Design

An institutional based cross sectional study design was used.

3.3. Population

3.3.1 Source population

All HIV infected children aged 2 -15 years who were under ART follow up and treatment in selected public hospitals in eastern Ethiopia.

3.3.2 Study population

All randomly selected HIV infected children aged 2 -15 years who were under follow up and treatment in the selected public hospitals in eastern Ethiopia.

3.3.3 Inclusion and exclusion criteria

3.3.3.1 Inclusion criteria

HIV infected children aged 2 -15 years who were in ART follow up and treatment in the selected public hospitals in Jigjiga, Dire Dawa and Harar town at the time of the data collection.

3.3.3.2 Exclusion criteria

Sampled HIV infected children aged 2 -15 years' children, who were critically ill and those care givers who were not able to communicate and those with incomplete registered data were excluded.

3.5 Sample Size Determination

EPI info version 7.0 was used to compute sample size by using an assumption of the proportion which gives maximum sample size. The sample size for each objective was computed using single and double population proportion formula.

$$\boldsymbol{n} = \frac{\left(\frac{z\alpha}{2}\right)^2 (pq)}{d^2}$$ Where n= sample size, z= 1.96, w= margin of error 5%

p= proportion of undernourished

Table 1- sample size calculation for objective one for the study on undernutrtion and associated factors among children attending anti retroviral therapy in public hospitals of Eastern Ethiopia, 2018.

Study conducted in	Proportion	Assumption	N total
Dire Dawa & Harar (Dawit, 2017)	Stunting= 30.9%	margin of error= 5% 10% non-response rate 95% confidence level	264
	Thinness= 11.6%		147
Addis Ababa (Atnafu, 2014)	Stunting= 62.1%,		283
Harar (Teklemariam *et al*, 2015)	Stunting= 49.1%		296
Addis Ababa (Birara,2017)	Stunting=37.4%		283
	Thinness= 15.6%		182
Addis Ababa (Atnafu, 2014)	Stunting= 71.3%		256
Gondar & Bahir Dar (Berihun *et al*, 2011)	Stunting= 65%		276
Hawassa (Wude, 2014)	Stunting= 60.5%		286

Table 2- sample size calculation for objective two for the study on undernutrtion and associated factors among children attending anti retroviral therapy in public hospitals of Eastern Ethiopia, 2018.

Study conducted in	**Factor**	**Outcome**		**AOR**	**(Total SS(+10% non-response rate)**
Dire Dawa (Dawit, 2017)	Dietary counseling	Under nourished	Not undernourished		
	Yes	5.7%	94.3%	3.010	389
	No	15.4%	84.6%		
(Berihun *et al*, 2011)	Follow up duration	Under nourished	Not undernourished	3.33	145
	<6 months	67.5%	32.5%		
	≥24months	41.8%	58.2%		
(Berihun *et al*, 2011)	Age	Under nourished	Not undernourished	4.10	139
	10-14 years	62.2%	37.8%		
	<5 years	35.9%	64.1%		

Finally, the required sample size for this study was by taking the maximum from the first and second objective sample size calculation results which was 389 pediatric children living with HIV/AIDS.

3.6. Sampling Procedure

Probability proportional sampling was employed to get the number of HIV infected children who were sampled in the study from each of the public hospitals in Jigjiga, Dire Dawa and Harar. In each hospital, a computer registered list of the HIV infected was used as a sampling frame and a simple random sampling method was used to recruit the HIV infected children were included in the study.

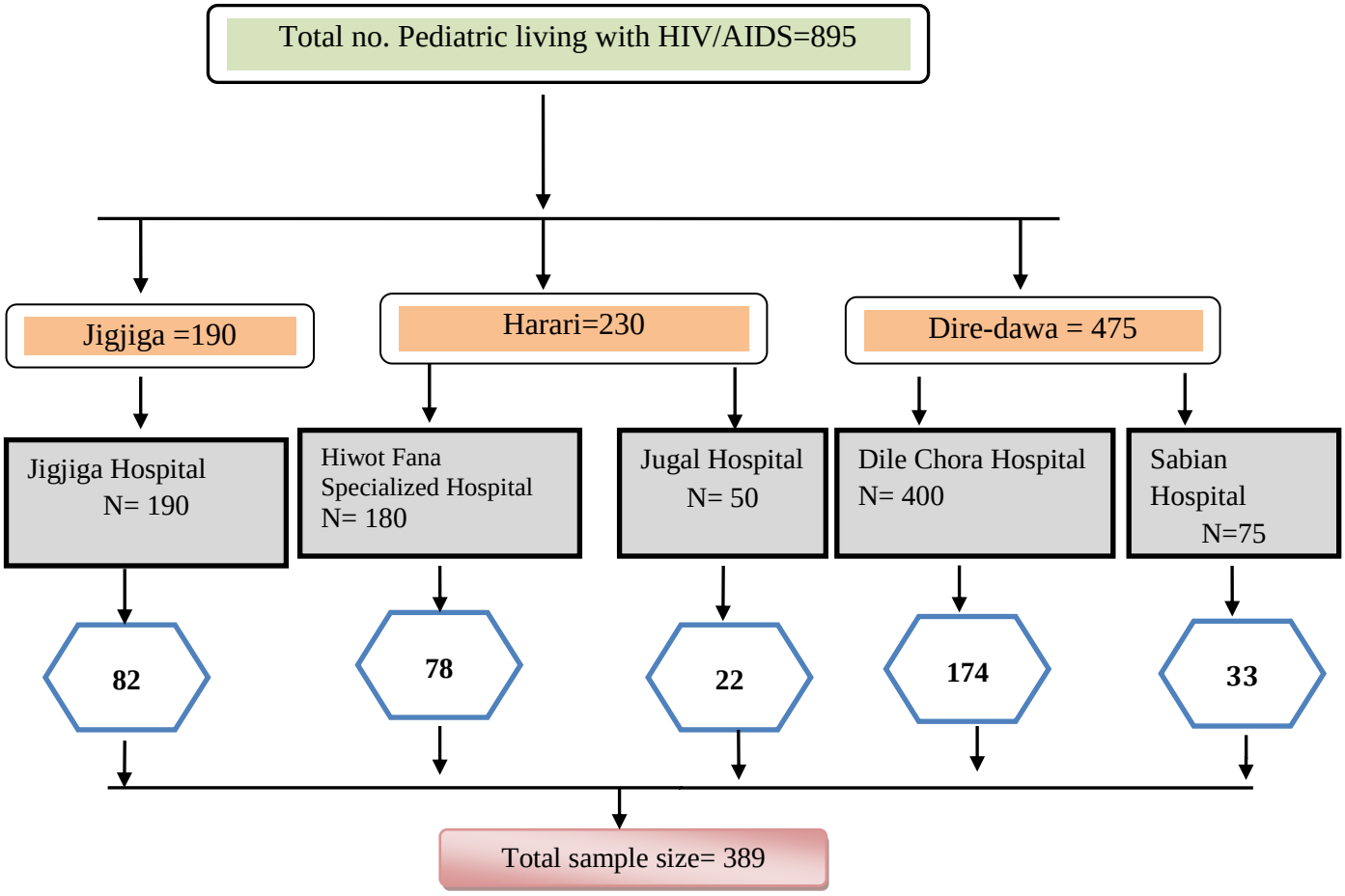

Figure 2- Schematic presentation of sampling procedure for the study on undernutrition among children attending anti retroviral therapy in public hospitals of Eastern Ethiopia, 2018.

3.7 Data Collection Instrument and Procedure

3.7.1 Questionnaire

Data were collected using structured questionnaire which was adapted from previous study in Ethiopia and modified according to the title (Dawit, 2017). The questionnaire was initially developed in English and translated into Amharic, Oromfa, and Somaligna and translated back to English language by different language experts. The questionnaire includes socio-demographics factors, caregiver-related factors, feeding practice, anthropometric measurements and medical and related factors of pediatric children.

3.7.2 Data Collectors and Data Collection Procedure

Data were collected using face-to-face interview and review of medical record. Five female BSc Nurses (one for each) who were working in the selected public health facilities facilitated the interview and three supervisors and principal investigator supervised them. Data collectors were trained on handling of ethical issue, sampling method and objective of the study.

3.7.3 Measurements

Weight - was measured by a digital scale to the nearest 0.1 kg, without shoes and wearing light clothes.

Height- was measured with portable stadio meter to the nearest 0.1cm with standing straight on a smoothly flat horizontal surface with their heels together, eyes straight forward, and touching the standing board at the heels, shoulder blades, buttocks and the back of the head. Weight and height was converted to height-for-age z-score (HAZ) and BMI for age Z- score (BAZ) according to WHO reference values (WHO, 2009, WHO, 2006).

Anemia- was measured using WHO criteria hemoglobin (Hgb) cutoff point for anemia and adjusted with altitude (average of 1500 meters above sea level) (WHO, 2011).

Dietary diversity- questions were asked with 16 food groups which consumed in the last 24hr and dietary diversity score was calculated with the seven food group (WHO, 2010).

Household food insecurity- was assessed using household food insecurity access scale which measures the degree of food insecurity in the past 30 days. It consists of occurrence (yes and no) and frequency of occurrence (rarely, sometimes and often) related questions. The total score will fall between 0-27(Coates, 2007).

Household food consumption score- was calculated by multiplying each food group frequency by each food group weight and then summing these scores into one composite score.

The household score can have a maximum value of 112. Average of weekly consumption frequency score ranges from zero for no consumption up to a maximum of seven for every day consumption. The weight of food groups was given minimum of 0.5 for sugar and oil and maximum of four for milk, meat and fish (WFP, 2008).

3.8 Variables

3.8.1 Dependent variable

- Stunting and thinness.

3.8.2 Independent variables

Socio-demographic variables: Age, sex, income, residence, parental education, family size, orphan-hood.

Environmental /sanitation factors: Source of drinking water and latrine utilization.

Dietary practice: food consumption pattern, dietary counseling, food insecurity and diet diversity.

Child Health status: WHO clinical stage of HIV/AIDS, Baseline and Current CD4 count, Adherence of ART drugs, cotrimoxazole on pre-ART treatment, TB treatment on pre-ART treatment, Follow up interval of ART treatment, duration of ART treatment, Therapeutic food during the course of ART treatment and opportunistic diseases, presence of eating problem, presence of diarrhea and anemia.

3.9 Operational definitions/definition of Terms

Pediatric Age Group: children aged less than 15years old**.**

Stunting: is defined as height for age index below -2 SD of the median of the standard curve (WHO, 2009).

Thinness: BMI for Age less than two standard deviations (<-2 SD) below the median reference Value with WHO Growth Standard (WHO, 2009).

High Dietary diversity: children consumed four and more than four food groups.

Low Dietary diversity: children consumed less than four food groups (WHO, 2010).

Food consumption score: categorized as poor (< 28 score), borderline (28 to 42 score) and good (≥ 42) (WFP, 2008).

Food insecure households: inability of households to access sufficient food at all time to lead Active and healthy life (includes all stages of food insecurity; mild, moderate and severe).

Mildly food insecure (access) household- households that worries about not having enough food sometimes or often, and/or is unable to eat preferred foods, and/or eats a more monotonous diet than desired and/or some foods considered undesirable, but only rarely (HFIAS, 2007).

Moderately food insecure household- households sacrifices quality more frequently, by eating a monotonous diet or undesirable foods sometimes or often, and/or has started to cut back on quantity by reducing the size of meals or number of meals, rarely or sometimes. But it does not experience any of the three most severe conditions (HFIAS, 2007).

Severely food insecure household - household has graduated to cutting back on meal size or number of meals often, and/or experiences any of the three most severe conditions (running out of food, going to bed hungry, or going a whole day and night without eating), even as infrequently as rarely (HFIAS, 2007).

Anemia- was defined as a hemoglobin concentration of less than 11 g/dL for ages less than 5 years, less than 11.5 g/dL for ages 5–11 years and less than 12 g/dL for ages 12–15 years. (WHO,2011).

Family monthly income- categorized as low (≤1000 ETB), medium (1001-2000 ETB) and high (>2000 ETB) using tertiles.

Adherence to ARV drugs- the recent adherence status of the child to the ART which is recorded as poor, fair and good based on left over pill count. Adherence is poor when the child takes less than 85% of the dose, fair when he/she takes 85-94% of the dose and good when he/she takes 95% and above of the dose.(FMOH, 2008)

Selected hospitals in eastern Ethiopia: includes Harar, Dire Dawa and Jigjiga.

3.10 Data quality control

Data collectors received training guide on how to conduct interview. The questionnaire was pretested on twenty HIV infected children (5% of the sample) in Jigjiga health center in order to cross-check for its objective and variable based completeness, consistency and acceptability. The principal investigator and supervisor were making close follow up and frequent checks on the interview process to ensure the completeness and consistency of the gathered information. Missing/incomplete data in outcome variable were omitted. Relative Technical error of measurement (TEM) was calculated to minimize anthropometric measurement error. Functionality of digital weight scales was checked using known weight every morning before data collection begin and before every weight measurement, the data collectors were assured as the scale reading exactly at zero (NHANES, 2007).

3.11 Data processing and analysis

The collected data were cleaned, coded and entered to computer with EPI data version 3.1 and was transferred to SPSS version 20.0 for analysis. Anthropometric measurements was calculated using the WHO Anthro and Anthros plus. The normality of data distribution was checked by using histogram, frequency and percentage tables and cross-tabulation. The descriptive statistics was summarized with frequency, percentage, mean and standard deviation and was presented in

bar graph and tables. Covariates having p-value <0.2 in the bivariable analysis was taken into multivariable model to appreciate the maintenance of their association by controlling confounders. Hosmer-Lemeshow statistics and SE was used to assess the goodness-of- fit of the models and multi-co-linearity, respectively. Finally, variables associated with the outcome variables at p-value <0.05 were considered as statistically significant.

3.12 Ethical considerations

To adhere to ethical issues, formal ethical approval letter was from Haramaya University, Health and Medical Sciences, Institutional Health Research Ethics Review Committee (IHRERC). Then, it was submitted to respective Public Hospitals sampled for study. Before conducting the study, clear description of the objective and potential risk and benefits of the study was given to mothers/guardian of child. Then, they were informed that the study is voluntary based they can participate or not, even if they were voluntary to participate they have right to withdraw themselves in the study at any time. They were reassured that the information was kept confidential; personal identifier was not used on the checklist and informed voluntary written and signed consent was obtained from parents/guardians and assent asked from the children before start interviewing and for those who are undernourished were referred for nutritional intervention.

4. RESULTS

4.1 Socio-Demographic Characteristics of Study Participants

Out of 389 planned study participants total of 376 pediatric age (2-15years) children attending ART clinic at public hospitals in Eastern Ethiopia were included with a response rate of 96.6%. Response data with missed dependent variable were excluded. The sex composition of study participants was relatively equal as 50.3% and 49.7% of them were male and female, respectively. Majority of children were in the age group 120-180 months (70.7%) and the mean (±SD) of the participants was 130.37 (± 41) months. Two hundred seven (55.1%) were Orthodox religion and 178 (47.3%) were from Amhara ethnic group. Majority of the respondents were urban residents 226 (60.1%).

The parenthood status of children indicated that 195 (51.9%) of the children's parents were both alive while 121 (32.2%) have either parent alive. among the study participants, one hundred and sixty one (42.8%) had low family monthly income. Regarding to the family size, two hundred and sixty eight (71.3%) households had four and above family members (Table - 3).

Table 3: Socio-demographic characteristics of children attending Anti retroviral therapy in public hospitals of Eastern Ethiopia, 2018.

Variables	Category	Frequency	Percentage
Age (months)	24-59	21	5.6
	60-119	89	23.7
	120-180	266	70.7
Sex	Male	189	50.3
	Female	187	49.7
Religion	Orthodox	207	55.1
	Muslim	126	33.5
	Protestant	39	10.4
	Catholic	4	1.1
Ethnicity	Oromo	123	32.7
	Amhara	178	47.3
	Harari	9	2.4
	Somali	33	8.8
	Tigrai	9	2.4
	Gurage	24	6.4
Residence	Rural	150	39.9
	Urban	226	60.1
Parental status	Both alive	195	51.9

	Single parent died	121	32.2
	Both died	60	16
Caregiver	Yes	376	100.0
His/her source of caregiver	Parents	246	65.4
	Family member	105	27.9
	Relatives	25	6.6
Educational status of Caregivers	Can't read and write	54	14.4
	Can read and write	98	26.1
	Primary (1-8)	151	40.2
	Secondary (9-10)	68	18.1
	Higher education	5	1.3
Family monthly income(birr)	Low income	161	42.8
	Medium income	108	28.7
	High income	107	28.5
Family size	Family less than four	268	71.3
	Family size four and above	108	28.7
Source of drinking water	Pipe	328	87.2
	Protected well	48	12.8
Latrine availability	Yes	349	92.8
	No	27	7.2

4.2 Medical Characteristics of Study Participants

Two hundred five (54.5%) of study participant's caregiver had received dietary counseling. Two hundred nine (55.6%) of the children had received therapeutic food during the course of ART treatment. Among the HIV positive pediatric age children, 164 (43.6%) had opportunistic infections. One hundred twenty (31.9%) of the study participants had experienced diarrhea in the past two weeks.

The proportion of previously and currently anemic HIV positive children were 56.1% (95%CI: 50.6, 61.6) and 31.9% (95%CI: 27.2, 36.7), respectively. Most of the children (359, 95.5%) had received cotrimoxazole on pre-ART. Almost half of the study participants were found on WHO clinical stage of two 173 (46%). Regarding the duration of ART treatment 194 (51.6%) of the children had been on ART for the past 7-13 years (Table 4).

Table 4: Medical characteristics of children attending Anti Retroviral Therapy in public hospitals of Eastern Ethiopia, 2018.

Variable	Category	Frequency	Percentage

Dietary counseling	Yes	205	54.5
	No	171	45.5
Presence of therapeutic food	Yes	209	55.6
	No	167	44.4
Eating problem	Yes	177	47.1
	No	199	52.9
Type of eating problem	Loss of appetite	139	37.0
	Swallowing difficulty	13	3.5
	Vomiting	18	4.8
	Others	7	1.9
Opportunistic disease	Yes	164	43.6
	No	212	56.4
Type of opportunistic disease	Pneumonia	43	11.4
	Tuberculosis	18	4.8
	Diarrheal disease	44	11.7
	Skin infections	42	11.2
	Gastro enteritis	16	4.3
	Others	1	0.3
Experience diarrhea in the past two weeks	Yes	120	31.9
	No	256	68.1
Previous anemia status (at ART initiation)	Yes	211	56.1
	No	165	43.9
Current anemia status	Yes	120	31.9
	No	256	68.1
Cotrimoxazole started on Pre-ART	Yes	359	95.5
	No	17	4.5
TB treatment on Pre-ART	Yes	43	11.4
	No	333	88.6
Baseline CD4 count	<200	41	10.9
	200-349	109	29
	350-499	45	12
	>500	181	48.1
Current CD4 count	<200	3	0.8
	200-349	22	5.9
	350-499	46	12.2
	>500	305	81.1
WHO clinical stage (On ART initiation)	WHO stage 1	148	39.4
	WHO stage 2	173	46.0
	WHO stage 3	54	14.4
	WHO stage 4	1	0.3

WHO clinical stage (On diagnosis)	WHO stage 1	91	24.2
	WHO stage 2	172	45.7
	WHO stage 3	109	29
	WHO stage 4	4	1.1
Adherence of the drug	Good	341	90.7
	Fair	19	5.1
	Poor	16	4.3
Duration ART follow Up (in years)	1-3	66	17.6
	4-6	116	30.9
	7-13	194	51.6

4.3 Dietary Characteristics of Study Participants

The dietary diversity level indicated that around one fourth 102 (27.1%); 95%CI (22.5, 31.9) of the study of study participants had low dietary diversity score whereas the remaining 274 (72.9%); 95%CI (68.1, 77.5) had high dietary diversity score. The food consumption score of study participants showed that slightly more than half of them lie in poor 71 (18.9%) and borderline 131(34.8%) category. Among the study participants, 160 (42.6%); 95%CI (38.0, 47.5) households had food insecurity while the rest 216 (57.4%): 95%CI (52.5, 62.0) households had food security. Among the food insecured households; 62 (16.5%), 63(16.8%) and 35 (9.3%) had mild, moderate and severe food insecurity, respectively (Figure - 3).

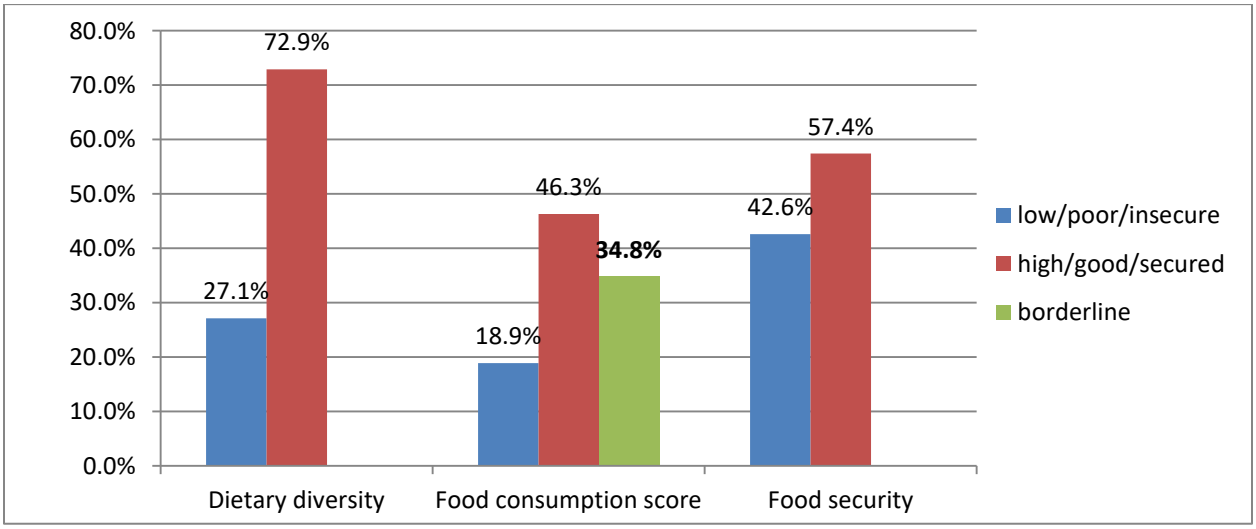

Figure 3: Dietary diversity, Food consumption score and Household food security of children attending Anti Retroviral Therapy in public hospitals of Eastern Ethiopia, 2018.

The consumption of meat, fish and egg is 83%, 67.1% and 70.2% of the study participants consumed for less than 2 days per week. Tubers and roots and grain and cereals consumption pattern indicated that 94.4% and 92.1% of the study participants consumed at least 3 days per week, respectively (Figure 4).

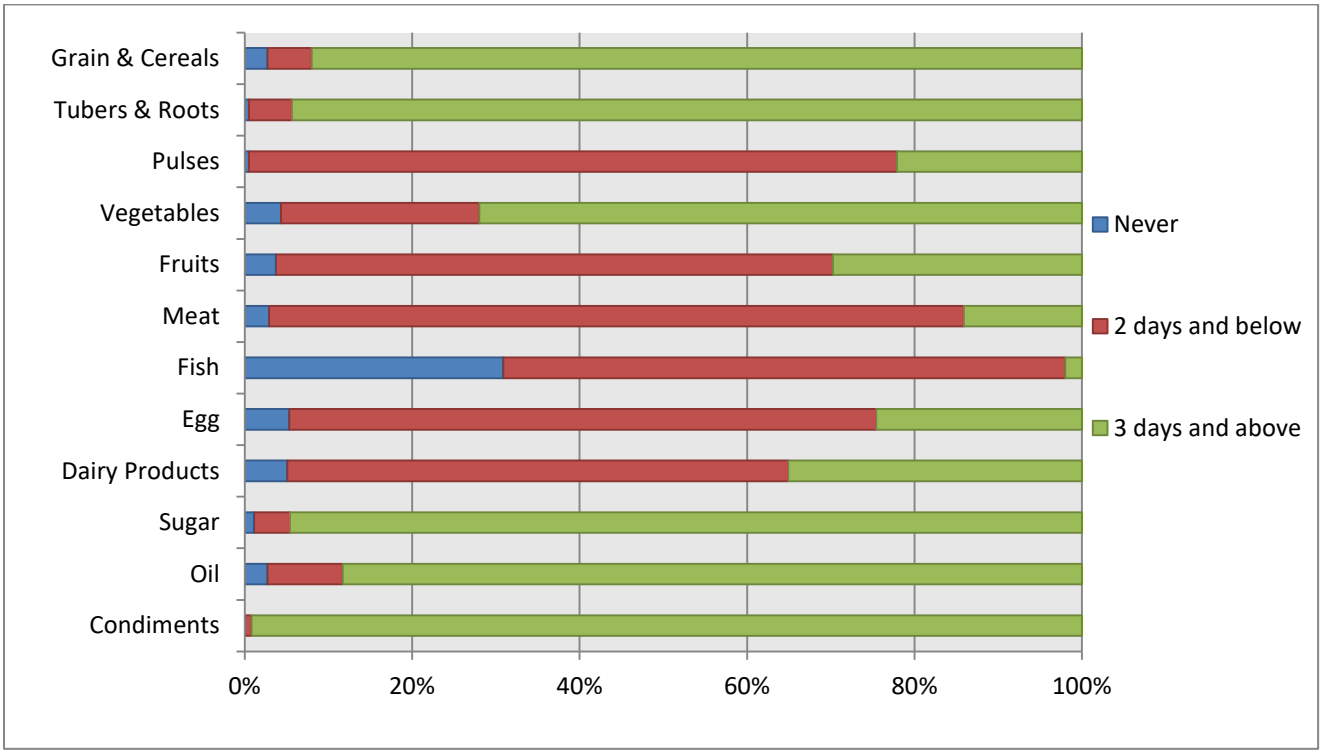

Figure 4: Food consumption pattern of children attending Anti Retroviral Therapy in public hospitals of Eastern Ethiopia, 2018.

4.4 Nutritional Status of HIV Positive Pediatric Children

Among the HIV positive Pediatric age children, around one fourth 93 (24.7% (95%CI: 20.7, 29.4) were stunted (HAZ Z-SCOR<-2), of which 13 (3.5%) of them were severely stunted (HAZ Z-SCOR<-3). Among the HIV positive Pediatric age children, one hundred six 28.2%, (95%CI: 23.7, 32.2) had thinness (BMI FOR AGE Z-SCOR<-2), while 17(16.9%) were overweight and only one was found obese (Figure 5).

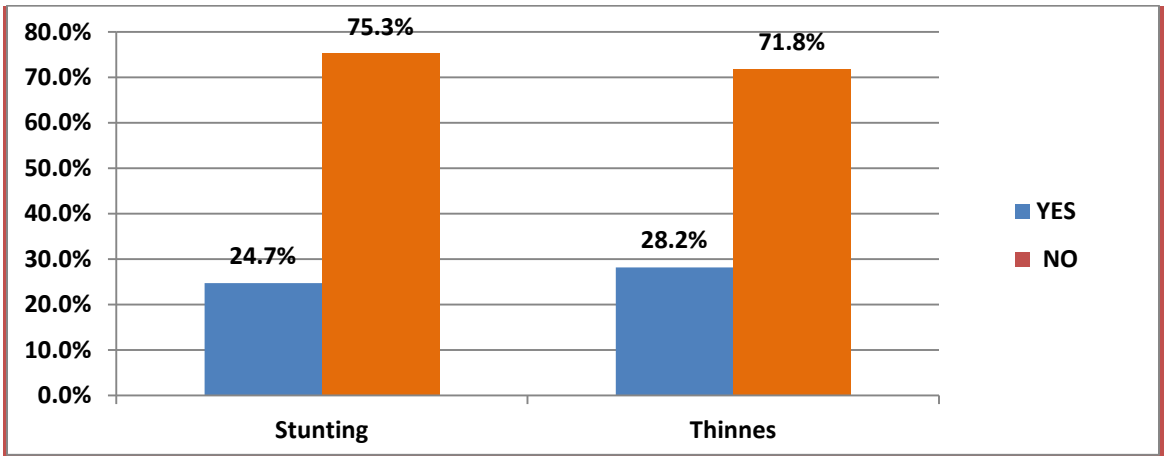

Figure 5: Proportion of stunting (HAZ) and thinness (BMI FOR AGE) among children attending Anti Retroviral Therapy in public hospitals of Eastern Ethiopia, 2018.

4.5 Factors Associated With Stunting

Bivariable and multivariable logistic regression analyses were performed to identify factors affecting the outcome variables. On bivariable analyses; residence, family income, dietary diversity, food consumption pattern, household food security, WHO clinical stage, anemia, presence of diarrhea in previous two weeks and duration of ART treatment follow-up were identified with p-value < 0.2 and considered as a candidate for multivariable logistic regression. In multivariable logistic regression; household food insecurity, low Hemoglobin (anemic), presence of Diarrhea and advanced WHO clinical stage (stage 3and 4) were significantly associated with stunting at p- value < 0.05.

Children from Households with food insecurity were 5 times more likely to be stunted than those from food secured households [AOR=5.08, 95% CI (2.29, 11.26)].Children who had anemia were 1.8 times more likely to be stunted than those children who had no anemia [AOR=1.8, 95%CI (1.02, 3.19)]. Regarding diarrhea in the last two weeks, children who had diarrhea in the past two weeks were 2.13 times more likely to be stunted than those children had no diarrhea in the past two weeks [AOR=2.13, 95% CI (1.18, 3.84)].Children in advanced WHO clinical stage were 2.51 more likely to be stunted than those in early stage [AOR=2.51, 95% CI (1.18, 5.34)]. (Table 5)

Table 5: Factors associated with stunting among children attending Anti Retroviral Therapy in public hospitals of Eastern Ethiopia, 2018.

Variable	Stunting		COR (95% CI)	AOR (95% CI)
	Yes (%)	No (%)		
Residence				
Urban	37 (16.4)	189 (83.6)	1	1
Rural	56 (37.3)	94 (62.67)	3.04 (1.88,4.93)*	1.61 (0.91,2.86)
Educational status of caregiver				
No formal education	48 (31.6)	104 (68.4)	1.84 (1.14,2.95) *	1.38 (0.75,2.54)
Formal education	45 (20)	179 (80)	1	1
Family income level				
Low	68 (42.2)	93 (57.8)	7.09 (3.45,14.6)*	1.71 (0.76,3.85)
Medium	15 (13.9)	93 (86.1)	4.53 (2.42,8.5)*	1.6 (0.56,4.61)
High	10 (9.3)	97 (90.7)	1	1
Dietary diversity				
Low	40 (39.2)	62 (60.8)	2.69 (1.64, 4.43)*	1.47 (0.76, 2.85)
High	53 (19.3)	221 (80.7)	1	1
HH food security				
Food insecure	72 (45)	88 (55)	7.59 (4.39, 13.13)*	5.08 (2.29,11.26) *
Food secure	21 (9.72)	195(90.28)	1	1
Food consumption				
Poor/borderline	59 (29.2)	143 (70.8)	1.7 (1.05,2.75)*	1.07 (0.57,2)
Good	34 (19.5)	140 (80.5)	1	1
Diarrhea in the past two weeks				
Yes	49 (40.8)	71 (59.2)	3.32(2.04,5.42)*	2.13 (1.18, 3.84) *
No	44 (17.2)	212 (82.8)	1	1
Anemic				
Yes	52 (20.3)	204(79.7)	2.04 (1.25,3.31)	1.8 (1.02, 3.19) *
No	41 (34.17)	79 (65.83)	1	1
WHO clinical stage				
Early stage(1 and 2)	72 (22.4)	249 (77.6)	1	1
Advanced stage(3and 4)	21 (38)	34 (62)	2.14 (1.17,3.91)*	2.51 (1.18, 5.34) *
Duration ART follow Up (in years)				
1-3	14 (21.2)	52 (78.8)	1	1
4-6	22 (19)	94 (81)	1.54 (0.79,3)	1.75 (0.92, 3.34)
7-13	57 (29.4)	137 (70.6)	1.78 (1.02,3.11)*	1.97 (0.89, 4.36)

4.6 Factors Associated With Thinness

Bivariable and multivariable logistic regression analyses were performed to identify factors affecting the outcome variables. On bivariate analyses; age group, sex, residence, parental status, family income, dietary diversity, food consumption pattern, household food security, WHO clinical stage, presence of diarrhea, presence of eating problem and presence of therapeutic food were identified with p-value < 0.2 and considered as a candidate for multivariate logistic regression.

In multivariable logistic regression, being male sex, low family monthly income, low dietary diversity, low(poor and borderline) food consumption pattern and presence of diarrhea were significantly associated with thinness at p-value < 0.05.

Male Children were 2.53 times more likely to be thin than female children [AOR=2.53, 95% CI (1.43, 4.45)].Children from family with low and medium monthly income were 3.12 times [AOR=3.12, 95%CI (1.15, 8.5)] and 2.25 more likely to be thin than those children from high family monthly income [AOR=2.25, 95%CI (1, 5.04)]. Children with low (poor and borderline) food consumption pattern were 2.49 times more likely to be thin than those children with high food consumption pattern. [AOR=2.49, 95%CI (1.31, 4.74)]. Children with low dietary diversity were 2.77 times more likely to be thin than those children with high dietary diversity. [AOR=2.77, 95%CI (1.44, 5.31)]. Regarding diarrhea in the last two weeks, children who had diarrhea in the past two weeks were 3.26 times more likely to be thin than those children had no diarrhea in the past two weeks[AOR=3.26, 95% CI (1.81,5.87)] (Table - 6).

Table 6: Factors associated with Thinness among children attending Anti Retroviral Therapy in public hospitals of Eastern Ethiopia, 2018.

Variable	Thinness		COR (95% CI)	AOR (95% CI)
	Yes	No		
Age				
Less than 7 yr	21 (42.2)	30 (57.8)	1.976 (1.074,3.64) *	1.77 (0.85,3.69)
7-15 yr	85 (26.2)	240 (73.8)	1	1
Sex				
Male	67 (35.5)	122 (644.5)	2.1(1.31,3.31) *	2.53 (1.43, 4.45) *
Female	39 (20.1)	148 (79.9)	1	1
Residence				
Urban	49 (21.7)	177 (78.3)	1	1
Rural	57 (380	93 (62)	2.21 (1.4,3.5)*	1.04 (0.58,1.86)
Parental status				
Both alive	48 (24.6)	147 (75.4)	1	1
Single died	35 (28.9)	86 (71.1)	1.53(0.79, 2.93)	1.32 (0.57,3.07)
Both died	23 (38.3)	37 (61.7)	1.9 (1.03, 3.52)*	1.43 (0.65,3.17)
Family income level				
Low	77 (47.8)	84 (52.2)	8 (3.99,16) *	3.12 (1.15, 8.5)*
Medium	18 (16.7)	90 (83.3)	4.6(2.53,8.3) *	2.25 (1,5.04) *
High	11 (10.1)	96 (89.9)	1	
Dietary diversity				
Low	56 (55)	46 (45)	5.45 (3.32,8.96) *	2.77 (1.44,5.31) *
High	50 (18.2)	224 (81.8)	1	
HH food security				
Food insecure	76 (47.5)	84 (52.5)	5.61 (3.42,9.2) *	1.89 (0.91,3.95)
Food secure	30 (14)	186 (86)	1	
Food consumption				
Poor/border line	59 (29.2)	143 (70.8)	1.12 (0.71,1.75)	2.49 (1.31,4.74)*
Good	47 (27)	127 (73)	1	1
Presence of therapeutic food				
Yes	70 (33.5)	139 (66.5)	1	1
No	36 (21.5)	131 (78.5)	1.83 (1.15,2.92)*	1.15 (0.58,2.29)
Eating problem				
Yes	63 (35.6)	114 (64.4)	2.0 (1.27,3.16)*	
No	43 (21.6)	156 (78.4)	1	1.08 (0.55,2.12)
Diarrhea in the past two weeks				
Yes	60 (50)	60 (50)	4.56 (2.83,7.37) *	3.26 (1.81,5.87) *
No	46 (18)	210 (82)		
WHO clinical stage				
Early stage(1 and 2)	87 (27)	234 (73)	1	1
Advanced stage(3and 4)	19 (34.5)	36 (65.5)	1.42 (0.77,2.61)	1.51(0.69,3.27)

5. DISCUSSION

HIV infected Children are more vulnerable to malnutrition. In the current study, the magnitude of stunting and thinness among pediatric children living with HIV/AIDS was 24.7% (95% CI: 20.7, 29.4) and 28.2% (95%CI: 23.7, 32.2) respectively. Household food insecurity, low Hemoglobin (anemic), presence of Diarrhea and advanced WHO clinical stage (stage 3and 4) were significantly associated with stunting and being male sex, low family monthly income, low dietary diversity, low(poor and borderline) food consumption pattern and presence of diarrhea were significantly associated with thinness.

The magnitude of stunting and thinness among pediatric children living with HIV/AIDS was 24.7% and 28.2% this is lower when compared to the study conducted in South Africa, Uganda and Mozambique in which the proportion of stunting was 36.2% (Lentoor, 2018), 68% (Nalwoga *et al*, 2010) and 57.4% (Maura *et al*, 2015), respectively. But, it is higher than study conducted in Nigeria where the proportion of stunting was 17.1% (Akintan *et al*, 2015). This variation could be due to the difference in study approach (Population and Hospital based); study population (age group) and sampling technique. The proportion of thinness in this study is higher than studies conducted in India, Uganda, Tanzania and Addis Ababa where the proportion of thinness was 19.5% (Swetha *et al*, 2015), 18% (Francis *et al*, 2015), 21.1% (Sunguya *et al*, 2014) and 15.6% (Birra, 2017), respectively. This disparity could be the study groups in other areas have socio-economic status.

In the current study, children with household food insecurity were 5.08 times more likely to be stunted. Reliable evidences confirm that food insecurity, under nutrition and HIV/AIDS are overlapping and have additive effects (Ivers *et* al, 2009). In this study, anemic children were 1.8 times more likely to be stunted. This is in line with previous study conducted in Harari Region and Dire Dawa City where anemic children were 3.1 times more likely to be stunted (Dawit, 2017). This study has found that children who experienced diarrhea in the last two weeks were 2.1 times more likely to be stunted. This was consistent with study in Harari Region and Dire Dawa City where the children who had diarrhea in the past two weeks were 6.2 times more likely to be stunted (Dawit, 2017). The current study identified children in advanced WHO clinical stage were 2.5 times more likely to be stunted. This is in line with study conducted in Thailand where malnutrition was significantly associated with severity of HIV/AIDS (advanced WHO

clinical stage) (Moolasart *et al*, 2017). Moreover, study among HIV-Infected Children Follow up in the pediatric unit in Cotonou found that malnutrition was associated with WHO clinical stage (Adedemy *et al*, 2016). This can be explained as co-infections with HIV are particularly problematic for those in more advanced stage of disease. As the immune system is weakened, individuals become more susceptible to other infections and make them susceptible to under nutrition. In the current study, children from family with low monthly income were 3.12 times more likely to be thin. This is in line with the study report from Harar and Dire Dawa where children from low family monthly income were 4.73 times more likely to be thin (Dawit, 2017). The possible reason could be HIV infection can indirectly affect the child's nutritional status, when it has an impact on the child's social environment. In some contexts evidences prove, when HIV concerns the most productive members of the family, the household economic capacities and the agricultural production are reduced, leading to a situation of food insecurity and finally to under nutrition (Anema *et al*, 2009).

In the current study, children with low dietary diversity were 2.77 times more likely to be thin. Similarly, reports from study in Harar and Dire Dawa identified children with low dietary diversity were 8.55 times more likely to be thin (Dawit, 2017). In the present study, children with low (poor and borderline) food consumption were 2.49 times more likely to be thin. We can understand that, if the diets consumed by children and adolescents are limited in diversity and meal patterns are inappropriate, consequently interfering with the distribution of nutrients over the day. That means there is a low energy intake and insufficient micronutrient intake (Ochola *et al*, 2014).

Strength and limitation of the study

One of the strengths of this study was the use of large sample size and inclusion of important clinical and dietary factors. To avoid recall biases, medical charts and ART data base were triangulated with the primary data collected. The hemoglobin level was adjusted with altitude level of study participants to avoid under-estimation. However, the cross-sectional nature and using institution based study limits the investigation to the level of the association between factors and outcomes of interest (malnutrition). Medical records can be also the other limitation and was minimized using the recent data. An anthropometric measurement error is also another limitation. To minimize this data collectors were well trained, standardization of anthropometric measurers were done, and the instrument was calibrated.

6. CONCLUSION AND RECOMMENDATION

6.1. Conclusion

There is medium prevalence of stunting and high prevalence of thinness among pediatric HIV patients in selected public hospitals in Eastern Ethiopia. Factors associated with stunting were household food insecurity, low hemoglobin (anemic), presence of diarrhea and WHO clinical stage. The determinants of thinness were being male, low family monthly income, low dietary diversity; low (poor and borderline) food consumption pattern and presence of diarrhea were significantly associated with thinness. It has been learnt that malnutrition and its problems in HIV pediatric patients are complex and interwoven; no single recipe exists as solution either.

6.2. Recommendations

Based on the current finding the following recommendation forwarded:

District and Regional health Bureau/public hospitals

- Promoting nutritional education regarding dietary diversity and feeding practice which has a main role in building immunity system and preventing opportunistic infection.
- Counseling on safe food preparation and storage and hygiene and sanitation practices.
- Nutritional managements or an intervention and supplementation, like Micronutrient supplements, routine vitamin A supplementation, and zinc supplementation to manage acute diarrhea should be given more emphasis.
- Children's who are in advanced stage should be given more attention regarding to their nutritional status and feeding practice.

Health support groups

- More emphasis should be given regarding to coping and income generating activities which are specific to local needs and economic conditions such as food assistance programs (food supplementation) and livelihood programs like financial products and services such as loan and savings, technical and life skills training to address household food security .

Further studies

- Research is needed to identify more variables that may determine the nutritional status children living with HIV/ADIS.

7. REFERENCES

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8. APPENDICES

Appendix I: Participant information sheet and informed voluntary consent form

8.1. Participant Information Sheet and Informed Voluntary Consent Form for Parents/Guardians.

Introduction

My name is……I am working as data collector for the study Being conducted in by Ms. Betelihem H/selassie (BSC in nursing) and who is now studying for her Master's degree in Public Health Nutrition at Haramaya University College of Health Science, School of Graduate Study. I kindly beseech you to give me your attention to brief you about study and you and your child being selected as the study participant. Thank you very much!

Study title: This study was aimed to assess the magnitude undernutrtion and associated factors among children attending anti retroviral therapy in public hospitals of eastern Ethiopia.

Purpose: The study will be helpful to assess the prevalence of under nutrition and its associated factors among children in the study area. Thus it will be used by policy makers and other concerned bodies to design appropriate strategies. Moreover, the major aim of this study is for the principal investigator, to write a thesis for partial fulfillments of Masters of Public Health in Nutrition.

Procedure and duration: First, your child has been included in this study randomly. Providing as with pertinent data is helpful for the study. There are questions to answer where other data collectors and I will fill by interviewing you. The interview will take 25 minutes and weight and height measurements takes around 10 minutes.

Risks: The risk of being participating in this study is minimal, only taking few minutes for interview and child measurements. Child measurement could not cause any physical harm on child.

Benefit: By this time, you and your child will not get any direct benefit for being participating
In this study but the information that you will provide will be essential to solve problems in this issue.

Confidentiality: The information that you and your child provide us will be confidential. There will be no information that will identify you and your child in particular. The finding of this study will be general for all study population and will not reflect any thing particular to individual person. The questionnaires will be coded to hide showing of names; no reference will be made in oral or written reports that could link participant to research.

Rights: Participation in this study is fully voluntary. You have the right to declare not to participate in this study. If you decide to participate first, you have the right to with draw from participating at any time and this will not result in any loss of benefit of you and your child that you otherwise are entitled. You do not have to answer any question that you do not want to answer.

Contact address: If you have any questions or enquire at any time about the study or the procedure, please contact through the following address:

Mobile phone of investigator: +251948630142 (Betelihem H/selassie)

Email address of investigator:**Bettywhite726@gmail.com**

Institutional Health Research Ethics Review Committee (IHRERC) Haramaya University:

Office phone: 0254662011: P.O.BOX: 235, Harar

Declaration of Informed consent

I have read/was read to me the participant information sheet. I have clearly understood the purpose the research, the procedures, the risks and benefits, issues of confidentiality, the rights of participating and the contact address for any queries. I have been given the opportunity to ask questions for things that may have been unclear. I was informed that I have the right to withdraw from the study at any time or not to answer any question that I don't want. Therefore, I declare my voluntary consent to participate in this study with my initials (signature).

Parent/guardians Name and Signature: _____.

Data collector's Name and Signature of: _____.

8.2 Participant information sheet and informed voultary consent form for Head of Hospitals

Introduction

My name is……I am working as data collector for the study Being conducted in by Ms. Betelihem H/selassie (BSC in nursing) and who is now studying for her Master's degree in Public Health Nutrition at Haramaya University College of Health Science, School of Graduate Study. I kindly beseech you to give me your attention to brief you about study and your institution being selected as the study setting.

Study title: This study was aimed to assess the magnitude of undernutrtion and associated factors among children attending anti retroviral therapy in public hospitals of eastern Ethiopia.

Purpose: The study will be helpful to assess the prevalence of under nutrition and its associated factors among children in the study area. Thus it will be used by policy makers and other concerned bodies to design appropriate strategies. Moreover, the major aim of this study is for the principal investigator, to write a thesis for partial fulfillments of Masters of Public Health in Nutrition.

Procedure and duration: I will be interviewing the parents /guardians using questionnaire to provide me with pertinent data that is helpful for the study. The interview will take 25 minutes and weight and height measurements takes around 10 minutes.

Risks: The risk of being participating in this study is minimal, only taking few minutes from parents/guardians time. Child measurement could not cause any physical harm on child.

Benefit: there would not be any direct payment for participating in the study. but the information that you will provide will be essential to solve problems in this issue.

Confidentiality: The information that will be provided will be kept confidential. There will be no information that will identify the participant in particular. The finding of this study will be general for all study population and will not reflect any thing particular to individual persons. The questionnaires will be coded to hide showing of names; no reference will be made in oral or written reports that could link participant to the research.

Rights: Participation in this study is fully voluntary. The participants have the right to declare not to participate in this study. If they decide to participate first, they have the right to with draw from participating at any time and this will not result in any loss of benefit which they otherwise are entitled. They do not have to answer any question that they do not want to answer.

Contact address: If you have any questions or enquire at any time about the study or the procedure, please contact through the following address:

Mobile phone of investigator: +251948630142 (Betelihem H/selassie)

Email address of investigator:**Bettywhite726@gmail.com**

Institutional Health Research Ethics Review Committee (IHRERC) Haramaya University:

Office phone: 0254662011: P.O.BOX: 235, Harar

Declaration of Informed consent

I have read the participant information sheet. I have clearly understood the purpose the research, the procedures, the risks and benefits, issues of confidentiality, the rights of participating and the contact address for any queries. I have been given the opportunity to ask questions for things that may have been unclear. I was informed that I have the right to withdraw from the study at any time or not to answer any question that I don't want. I am also informed that the hospital has the right to stop this study from being conducted if any misdeeds and unethical procedures are observed during the data collection process in the hospital's premises .Therefore, I declare my voluntary consent on behalf of_____ management to allow this study conducted in the hospital with my initials (signature).

Name and Signature of head of Hospital: _____.

Name and Signature of data collector: _____.

Appendix II: Questionnaire

8.3. English Version Questionnaire

Date of interview	**Date**		**Month**		**Year**			
					2	0	1	8
Institution's Name								
Code number								
Interviewer's	Name			Signature				
Supervisor's	Name			Signature				

part I: Socio demographic and economic characteristics			
C .no	**Variables**	**Category**	**Remark**
101	Age (years)	_____	
102	Sex	1.Male 2.Female	
103	Religion	1.Orthodox 2.Muslim 3.Protestant 4.Catholic 5.Others_____	
104	Ethnicity	1. Oromo 2. Amhara 3. Harari 4. Somali 5. Tigre 6. Others_____	
105	Residence	1.Rural2.Urban	
106	Parental status	1. Both alive 2. Mother died 3. Father died 4. Both died 5. Separated/Divorced	
107	Is there caregiver?	1.Yes 2.No	if no ⇨ 108
1071	His/her source of caregiver.	1.Mother/ father 2.Religious father 3.Wife 4.Husband 5.Children 6.Others _____	

107	Educational status of caregiver?		
108	Did you get dietary Counseling?	1. Yes 2. No	
109	Family monthly Income (in birr)	_____	
110	Source of drinking water	1. Pipe 2. Protected well 3. River /pond/unprotected well 4. Other Mention	
111	Latrine availability for the family	1. Yes 2. No	
112	What is the child's family size?	_____	
Part II: Medical and other related characteristics			
201	Presence of therapeutic food during the course of ART treatment	1.Yes 2.No	
202	Presence of eating problems	1.Yes2.No	if no ⇨ 203
2021	Type of eating problems	1.Loss of appetite 2. Swallowing difficulty 3. Vomiting 4.Others	
203	Presence of opportunistic disease	1.Yes 2.No	if no ⇨ 204
2031	Type of opportunistic disease	1. Pneumonia 2. Tuberculosis 3. Diarrheal disease 4. Skin infections 5. Gastro enteritis 6.Others_____	
205	WHO clinical stage	_____	
206	Duration of Pre-ART treatment	_____	
207	Duration of ART treatment follow up	_____	
208	Follow up interval of ART treatment	_____	
219	Hemoglobin level in mg/dl	_____	
210	Base line CD4 count	_____	
211	Current CD4 count	_____	
212	Adherence of the drug	1.Good 2.Fair 3.Poor	
216	Did you experience diarrhea in the past two weeks?	1. Yes 2. No	

Part III: Questions to assess children's dietary consumption pattern

Instruction: Ask the mother(caregiver) to recalls all the foods and beverages consumed yesterday during the day and night, whether at home or outside the home., underline the corresponding foods in the list under the appropriate food group and write "1" in the column next to the food group if at least one food in this group has been underlined. Once the recall is finished, probe for food groups where no food was underlined.

Q. No	**Food group**	**Response Yes (1) No (0)**
301	Injera, kita, qollo, pourage, bread, rice, biscuits, or any other foods made from millet, barely, oat, sorghum, maize, rice, wheat, or teff	
302	Potatoes, yams, manioc, cassava or any other foods made from roots or tubers	
303	Vitamin A rich vegetables and tubers like Pumpkin, carrot, or sweet potato, red sweet pepper	
304	Dark green leafy vegetables like cabbage, lettuce, spinach?	
305	Other fruits and vegetables like tomato, onion, lemon	
306	Any vitamin A rich fruits like avocado, mango, papaya or banana and 100% fruit juice made from these	
307	Liver, kidney, heart or other organ meats or blood-based foods	
308	Any beef, lamb, goat, chicken, or other birds, liver	
309	Any eggs	
310	Any fresh or dried fish or shellfish	
311	Any foods made from beans, peas, lentils, or nuts	
312	Any cheese, yogurt, milk or other milk products	
313	Any foods made with oil, fat, or butter	
314	Any sugar or honey	
315	Any other foods, such as condiments, coffee, tea, local bear, alcohol	
316	Other fruits	

Part IV: Food frequency questionnaire								
NO	**QUESTIONS**	**1–2 days**	**3-4 days**	**More than 4days**	**Everyday**	**1 time in 10–15 days**	**1times in 1times in months**	**Never**
401	How many times does your child consume milk/milk and yogurt during 1 week?							
402	How many times do you give pasta/macaroni rice/bread during 1 week?							
403	How many times do you give fruit during 1 week?							
404	How many times do you give vegetables during 1 week?							
405	How many times do you give meat during 1 week?							
406	How many times do you give fish during 1 week?							
407	How many times do you give egg during 1 week?							
408	How many times do you give maize/sorghum during 1 week?							
409	How many times do you give pea/beans/ ground nuts during 1 week?							
410	How many times do you give potatoes /sweet potatoes during 1 week?							
411	How many times do you give sugar/honey during 1 week?							
412	How many times do you give oils/fats/butters during 1 week?							
413	How many times do you give spices, tea/coffee/ small milk in tea/coffee during 1 week?							

Part V: Questions to assess household food security condition (HFIAS)

Q. No	Questions	Response options (encircle one)	skip
501.	In the past four weeks, did you worry that your household would not have enough food?	0 = No 1=Yes	If 0, Q 502
501.a	How often did this happen?	1 = Rarely (1X or 2X in the past four weeks) 2 = Sometimes (3x to 10x in the past four weeks)	

		3 = Often (>10x in the past four weeks)		
502.	In the past four weeks, were you or any household member not able to eat the kinds of foods you preferred because of a lack of resources?		0 = No 1=Yes	If 0, to Q 503
502.a	How often did this happen?	1 = Rarely (1X or 2X in the past 4 weeks) 2 = Sometimes (3x to 10x in the past four weeks) 3 = Often (>10x in the past four weeks)		
503	In the past four weeks, did you or any household member have to eat a limited variety of foods due to a lack of resources?		0 = No 1=Yes	If 0, to Q 504
503.a	How often did this happen?	1 = Rarely (1X or 2X in the past four weeks) 2 = Sometimes (3x to 10x in the past four weeks) 3 = Often (>10x in the past four weeks)		
504	In the past four weeks, did you or any household member have to eat some foods that you really did not want to eat because of a lack of resources to obtain other types of food?		0 = No 1=Yes	If 0, to Q 505
504.a	How often did this happen?	1 = Rarely (1X or 2X in the past four weeks) 2 = Sometimes (3x to 10x in the past four weeks) 3 = Often (>10x in the past four weeks)		
505	In the past four weeks, did you or any household member have to eat a smaller meal than you felt you needed because there was not enough food?		0 = No 1=Yes	If 0, to Q 506
505.a	How often did this happen?	1 = Rarely (1X or 2X in the past four weeks) 2 = Sometimes (3x to 10x in the past four weeks) 3 = Often (>10x in the past four weeks)		
506	In the past four weeks, did you or any other household member have to eat fewer meals in a day because there was not enough food?		0 = No 1=Yes	If 0, to Q 507
506.a	How often did this happen?	1 = Rarely (1X or 2X in the past four weeks) 2 = Sometimes (3x to 10x in the past four weeks) 3 = Often (>10x in the past four weeks)		
507	In the past four weeks, was there ever no food to eat of any kind in your household because of lack of resources to get food?		0 = No 1=Yes	If 0, to Q 508
507.a	How often did this happen?	1 = Rarely (1X or 2X in the past four weeks) 2 = Sometimes (3x to 10x in the past four weeks) 3 = Often (>10x in the past four weeks)		
508	In the past four weeks, did you or any household member go to sleep at night hungry because there was not enough food?		0 = No 1=Yes	If 0, to Q 509
508.a	How often did this happen?	1 = Rarely (1X or 2X in the past four weeks) 2 = Sometimes (3x to 10x in the past four weeks) 3 = Often (>10x in the past four weeks)		
509	In the past four weeks, did you or any household		0 = No (Questionnaire	If 0, to

	member go a whole day and night without eating anything because there was not enough food		finished) 1=Yes	part VI
509.a	How often did this happen?	1 = Rarely (1X or 2X in the past four weeks) 2 = Sometimes (3x to 10x in the past four weeks) 3 = Often (>10x in the past four weeks)		
Part VI: Anthropometric Measurements				
501	Weight (kg)	_____		
502	Height of the client (in cm)	_____		
503	Age (in months and /or years)	_____		

8.4 Amharic Version Questionnaire

ክፍል አንድ፡ -የስነ -ህዝብና ማህበራዊ ጉዳዮችን በተመለከተ ሚዳለ ማገኝትየ ተዘጋጀ ዝር ዝር፡ ፡			
ተራ. ቁጥር	ተለዋዋጭ	ሞጂብ	ማለጫ
101	እድሜ	———	
102	ፆታ	1.ወንድ 2.ሴት	
103	የ ሀይማኖት ሁኔታ	1. ኦርቶዶክስ 2. ማክሊም 3.ፕሮቴስታንት 4.ካቶሊክ 5.ሌላ ------—	
104	ብሄር	1.ኦሮሞ 2.አማራ 3.ሀረሪ 4.ሶማሌ 5.ትግራ 6.ሌላ ———	
105	የ ሞሪያ ቦታ	1.ገጠር 2.ከተማ	
106	የ ቤተሰብ ሁኔታ	1.ሁሉምበህይወት አሉ 2.እናት ብቻ በህይወት አሉ 3.አባት ብቻ በህይወት አሉ 4.ሁሉምየ ሞቱ 5.የ ተለያዩ / የ ተፋቱ	
107	ተንከባካቢ አላቸውወይ ?	1.አዎ 2.የ ሜል	የ ለም ከሆነ ወደ 109

			እለፍ
1071	ማን ነ ውየ ሚከ ባ ከ ባ ቸው?	1.እ ና ት/አ ባ ት 2.የ ሀ ይ ማ ሾ ት 3. አ ባ ቶ ች 4. ወ ን ዲ ማ 5.ሌ ላ ካ ለ ——	
108	ስ ለ ምግ ብ ማ ብ ሰ ል ይ ሰ ጣ ች ታ ል እ ን ዴ?	1.አ ዎ 2.የ ለ ም	
109	የ ቤ ተ ሰ ብ የ ወ ር ገ ቢ በ አ ማ ካ ኝ ስ ን ት ነ ው?	————	
110	የ ማ ኩ ጥ ውሀ ከ ምን ድ ን ነ ውየ ም ታ ገ ኙ ት?	1.ከ ቧ ን ቧ 2.ከ ምን ጭ 3.ከ ወ ን ዝ/ከ ኩ ሬ/ም ን ጭ ል ሆ ነ 4.ሌ ላ ካ ለ	---------- -------
111	ሽ ን ት ቤ ት አ ላ ች ሁ ወ ይ ?	1. አ ዎ 2.የ ለ ም	
ክ ፍ ል ሁ ለ ት፡ - የ አ ካ ል ም ር ሚ ራ ና ተ ያ ያ ዥ ማ ከ ረ ታ ዊ ች ግ ሮ ች ን ለ ማ ላ የ ት የ ተ ዘ ጋ ጀ ማ ዘ ር ዝ ር			
201	ኤ ች አ ይ ቪ ሜ ድ ሀ ኒ ት ሲ ጠ ቀ ም ስ ት ጠ ቀ ም በ ሜ ድ ሀ ኒ ት ሜ ል ክ የ ተ ዘ ጋ ጀ ምግ ብ ወ ስ ደ ዋ ል ?	1.አ ዎ 2.የ ለ ም	
202	የ አ ማ ጋ ገ ብ ች ግ ር አ ለ ?	1.አ ዎ 2.የ ለ ም	የ ለ ም ከ ሆ ነ ወ ደ 203 ይ ለ ፉ
2021	ምን አ ይ ነ ት የ አ ማ ጋ ገ ብ ች ግ ር ነ ው ያ ለ ባ ች ው?	1.የ ምግ ብ ፍ ላ ጎ ት መ ቀ ነ ስ 2.የ መ ዋ ጥ ች ግ ር 3.የ ማ ስ መ ላ ስ ች ግ ር 4.ሌ ላ ካ ለ	
203	ተ ጓ ዳ ኝ የ ጡ ት ች ግ ር አ ለ ባ ች ው ወ ይ ?	1.አ ዎ 2.የ ለ ም	የ ለ ም ከ ሆ ነ ወ ደ 204 ይ ለ ፉ

2031	ምን ዓይነ ት የ ጤፍ ችግር አ ለ ባ ቸ ው?	1.የ ሳ ምባ ምች 2.የ ቆዳ በ ሽ ታ 3.የ ሳ ምባ ነ ቀር ሳ 4.የ ተ ቅ ማ ጭ በ ሽ ታ 6..ሌላ ካ ለ ይ ጠ ቀ ስ 5.የ ጨ ፌ ራ ህ ማ ም	
204	በ ስ ን ት ዓ ሚ ቱ ነ ው በ ሽ ታ ው የ ተ ገ ኘ በ ት ?	————	
205	በ ዓ ለ ም የ ጤፍ ድር ጅ ት ማ ኅ ረ ት ስ ን ተ ኛ የ ኤ ች አ ይ ቪ በ ሽ ታ ደ ረ ጃ ላ ይ ና ቸ ው?	————	
206	የ ቅ ድ መ ሞ ድ ሀ ኒ ት ከ ጀ ሚ ሪ ምን ይ ህ ል ጊ ዜ ሆ ነ ው?	————	
207	ሞ ድ ሀ ኒ ት ሳ ይ ጀ ምር ምን ያ ህ ል ጊ ዜ ቆ የ ?	————	
208	ሞ ድ ሀ ኒ ት ከ ጀ ሚ ር ስ ን ት ጊ ዜ ሆ ነ ው?	————	
209	ለ ምን ያ ህ ል ጊ ዜ እ ዚ ህ ሆ ስ ፒ ታ ል ተ ጣ ላ ለ ስ ክ/ሽ?	————	
210	የ ሂ ሞ ግ ሎ ቪ ን ማ ከ ን በ ሚ ሊ ግ ራ ም	————	
211	የ መ ጀ መ ሪ ያ ላ ይ የ ሲ ዲ ፎ ር ማ ከ ን ስ ን ት ነ በ ር?	————	
212	አ ሁ ን ላ ይ የ ሲ ዲ ፎ ር ማ ከ ን ስ ን ት ነ ው?	————	
213	የ ኤ ች አ ይ ቪ ሞ ድ ሀ ኒ ት አ ወ ሳ ሰ ድ በ ተ ጣ ላ ከ ተ ምን ይ ጣ ከ ላ ሉ?	1.ጥ ሩ 2.ማ ካ ከ ለ ኛ 3.ደ ካ ማ	
214	ለ ምን ያ ህ ል ጊ ዜ ነ ው ል ጁ ጡ ት የ ጡ ባ ው?	1.ከ ስ ድ ስ ት ወ ር በ ታ ች 2.ከ ስ ድ ስ ት-አ ስ ራ አ ን ድ ወ ር 3.ከ አ ስ ራ ሁ ለ ት-ሀ ያ አ ራ ት ወ ር 4.ከ ሀ ያ አ ራ ት ወ ር በ ላ ይ 5.አ ላ ው ቅ ም	

215	ሌላ ተጨማሪ ምግብ ወይምፈሳሽ ተሰቶት ነ በር?	1.አዎ 2.አይደለም	አይደለ ምከሆነ ወደ ጥያቄ 217 እለፍ
216	ጥያቄ 215 አዎ ከሆነ ለልጁ ተጨማሪ ምግብ ወይምፈሳሽ ማእጠት የጀመሺውስንተኛ ወር ላይ ነ ው?	1.ከሰስድስት ወር በታች 2.ልክ ስድስት ወር ላይ 3.ከሰስድስት ወር በላይ 4.አላውቅም	
217	ባለፉት ሁለት ሳምንታት ተቅማጥ ተይዞ ነ በር ወይ?	1.አዎ 2.አይደለም	

ክፍል ሦስት፡ -ስለህፃ ናት አመጋገ ብ ጥያቄ

መመሪያ፡ -ባለፉት ሀያአራት ሰዓት ውስጥ ቤትህምከ ቤትህምውጭየ ተማ ባቸውየ ምግብ አይነ ት ከቁጥር 301-315 ላይ ከተጠቀሱት ውስጥ የ ትኛውን እንደተማ በ/ች ለማከየ ቅ ከተጠቀሱት የ ምግብ አይነ ት አንዱን ተመገቦ/ባ ከሆነ በተጠቀሱት የ ምግብአ|ይነ ት ፊትለፊት ወይምሜልስ በሚለውቦታ 1 ቁጥር ማላ (መይ)፡

የ ኮድ ቁጥር	የ ምግብ ዓይነ ት	ሜልስ 1 አዎ2.የ ለም
301	እንጀራ፣ ቂጣ፣ ቆሎ፣ ገንፎ፣ ዳቦ፣ ሩዝ፣ ብስኩት፣ ወይምበአካባቢው ከተለያዩ ጥራጥሬ የ ሚሰራ ምግብ ከገ ብስ፣ ከአጃ፣ ከማሽላ፣ ከበቆሎ፣ ከስንዴ፣ ከጤፍ፣ እና ከማሰሉት የ ሚሰራ	
302	ድንች፣ የ ስኳርድንች፣ ካዛባ፣ እና የ ማሰሉት ስራስራቸውየ ሚበላ እፅዋት	
303	በቪታሚን ኤ የ በለፀጉ ቅጠላቅጠሎች፣ አትክልቶች፣ እንደዱባ፣ ካሮት፣	
304	አረንጓዴ ቅጠላቅጠል እንደ ጎመን፣ ሰላጣ	
305	ሌሎች ፍራፍሬ እና ቅጠላቅጠል እንደቲማቲም፣ ሽንኩርት፣ እናሎሚ	
306	ማንኛውምበቪታሚን ኤየ በለፀ ገ ፍራፍሬ እንደ አቩካዶ፣ ማንጎ ፣ ፓፓዬ፣ ወይምከእነ ዚህ የ ፍራፍሬ ጁስ የ ተሰራ	
307	የ እንሰሳት ስጋ አካል እንደ ጉበት፣ ኩላሊት፣ ልብ፣ ወይምሌላ	
308	የ እንሰሳት ስጋ፣ የ ጥጃ ስጋ፣ የ በግ ስጋ፣ የ ፍየል ስጋ፣ የ ዶሮ ስጋ	

309	እንቁላል	
310	ዓሳወይምሰርዲን	
311	ማነኛውምከባቄላ፣ ከአተር፣ ከምስር፣ ከሽንብራ ወይምከሎዝ የተዘጋጀም ግብ	
312	ከማነኛውምአይብ፣ እርጎ ፣ ወተት፣ ወይምሌላ ከወተት የተሰራ ምግብ	
313	ከማነኛውምዘይት፣ ጮማወይምቂቤ ያለውምግብ	
314	ሚር ወይምስኳር	
315	ሌላ ምግብእንደ ሻይ፣ ቡና ፣ ጨው፣ ቅመምአልኮል	

ክፍል አራት፡ - ስለ ምግብ ብዛት

ጥያቄ ቁጥር	ጥያቄ	1-2 ቀን	3-4 ቀን	ከ 4 ቀን በላይ	ሁሌ	1 ጊዜ በ 10-15 ቀን	1 ጊዜ በ 10-30 ቀን	የለም
401	ላልፉት አንድ ሳምንት ከማነኛውምአይብ፣ እርጎ ፣ ወተት፣ ወይም ሌላ ከወተት የተሰራ ምግብ ሲንት ጊዜ ወሰደዋል							
402	ላልፉት አንድ ሳምንት ከማነኛውምማክሮን ሲንት ጊዜ ወሰደዋል							
403	ላልፉት አንድ ሳምንት ከማነኛውም ፍራፍሬምግብ ሲንት ጊዜ ወሰደዋል							
404	ላልፉት አንድ ሳምንት ከማነኛውምአትክልቶች ምግብ ሲንት ጊዜ ወሰደዋል							
405	የላልፉት አንድ ሳምንት ከማነኛውምእንሰሳት ስጋ፣ የጥጃ ስጋ፣ የበግ ስጋ፣ የፍየል ስጋ፣ የዶሮ ስጋ ምግብ ሲንት ጊዜ ወሰደዋል							
406	የላልፉት አንድ ሳምንት ከማነኛውምዓሳ ወይም ሰርዲን ምግብ ሲንት ጊዜ ወሰደዋል							

407	የላልፉት አንድሳሚንት እንቁላል ሲንት ጊዜ ወሰደዋል								
408	የላልፉት አንድሳሚንት ከገብስ፣ ከአጃ፣ ከማሽላ፣ ከበቆሎ፣ ከስንዴ፣ ከጤፍ፣ እና ከማሳሰሉት የሚሰራምግብሲንት ጊዜ ወሰደዋል								
409	የላልፉት አንድሳሚንት ማንኛውምከባቄላ፣ ከአተር፣ ከምስር፣ ከሽንብራ ወይምከሎዝ የተዘጋጀ ምግብሲንት ጊዜ ወሰደዋል								
410	የላልፉት አንድሳሚንት ድንች፣ የስኳር ድንች ሲንት ጊዜ ወሰደዋል								
411	የላልፉት አንድሳሚንት ሜር ወይምስኳር ሲንት ጊዜ ወሰደዋል								
412	የላልፉት አንድሳሚንት ከማንኛውምዘይት፣ ጮማወይምቂቤ ያለው ምግብሲንት ጊዜ ወሰደዋል								
413	ሌላ ምግብእንደ ሻይ፣ ቡና፣ ጨው፣ ቅመምሲንት ጊዜ ወሰደዋል								

ክፍል አሥሰት፡ - ስለ ምግብ ዋስትና የ ሚሞላ ከት ጥያቄዎች፡ ፡

ጥያቄ ቁጥር	ጥያቄ	ከሚልስ አሚራጭ (አንዱንክበብ)	ሚላያ
501	ባለፉት አራት ሳምንታት ውስጥ ቤተሰቦቻችሁ በቂ ምግብ የለንምወይምአለቀብን ብሎአሳስበዋችሁ ታውቃላችሁ ወይ?	0=የለም 1=አዎ	0 ከሆነ ወደ ጥያቄ 402 እለፍ
501 a	አዎ ከሆነ ይህ ሀሳብለስንት ጊዜ ነው ያጋጠሞቸወሁ ?	1=በተወሰነ ጊዜ (ባለፉት አራት ሳምንታት ውስጥ 1 ጊዜ ወይም2 ጊዜ) 2=አንዳንድ ጊዜ (ባለፉት	

		አራት ሳምንት ውስጥ 3 ጊዜ ወይም10 ጊዜ) 3=ብዙ ጊዜ (ባለፉት አራት ሳምንት ውስጥከ 10 ጊዜ በላይ)	
502	ባለፉት አራት ሳምንታት ውስጥ ከእናንተ ወይም ከቤተሰብ አባላት ውስጥ ብር ወይምንብረት በማጣት አሚራጭምጣብ ሳትማ ቡ ቀርታችኋል ወይ?	0=የለም 1=አዎ	0 ከሆነ ወደ ጥያቄ 403 እለፍ
502 a	አዎ ከሆነ ይሄ ችግር ካለ ለስንት ጊዜ ነው ያጋጠማችሁ?	1=በተወሰነ ጊዜ (ባለፉት አራት ሳምንታት ውስጥ 1 ጊዜ ወይም2 ጊዜ) 2=አንዳንድ ጊዜ (ባለፉት አራት ሳምንት ውስጥ 3 ጊዜ ወይም10 ጊዜ) 3=ብዙ ጊዜ (ባለፉት አራት ሳምንት ውስጥ ከ 10 ጊዜ በላይ)	
503	ባለፉት አራት ሳምንታት ውስጥ ከእናንተ ወይም ከቤተሰብ አባላት ውስጥ ብር ወይምንብረት በማጣት የተወሰነ የምግብ አይነት ብቻ ተገዳችሁ ነበር ወይ ?	0=የለም 1=አዎ	0 ከሆነ ወደ ጥያቄ 404 እለፍ
503 a	አዎ ከሆነ ይሄ ችግር ካለ ለስንት ጊዜ ነው ያጋጠማችሁ?	1=በተወሰነ ጊዜ (ባለፉት አራት ሳምንታት ውስጥ 1 ጊዜ ወይም2 ጊዜ) 2=አንዳንድ ጊዜ (ባለፉት አራት ሳምንት ውስጥ 3 ጊዜ ወይም10 ጊዜ) 3=ብዙ ጊዜ (ባለፉት አራት ሳምንት ውስጥ ከ 10 ጊዜ በላይ)	
504	ባለፉት አራት ሳምንታት ውስጥ ከእናንተ ወይም ከቤተሰብ አባላት ውስጥ ብር ወይምንብረት በማጣት መመጣብያልፈለጋችሁትን ምግብለመመጣብ የተገደዳችሁበት ጊዜ ነበር ወይ ?	0=የለም 1=አዎ	0 ከሆነ ወደ ጥያቄ 405 እለፍ
504 a	አዎ ከሆነ ይሄ ችግር ካለ ለስንት ጊዜ ነው	1=በተወሰነ ጊዜ (ባለፉት አራት ሳምንታት ውስጥ 1	

	ያጋጠማቸሁ?	ጊዜ ወይም2 ጊዜ) 2=አንዳንድ ጊዜ (ባለፉት አራት ሳምንት ውስጥ 3 ጊዜ ወይም10 ጊዜ) 3=ብዙ ጊዜ (ባለፉት አራት ሳምንት ውስጥ ከ 10 ጊዜ በላይ)	
505	ባለፉት አራት ሳምንታት ውስጥ ከእናንተ ወይም ከቤተሰብ አባላትውስጥ በቂ ምግብ ስለሌለ በቂ ምግብ ለመማ ብ ፈልጋችሁ ከፈለጋችሁት በታች ለመማ ብ የ ተዘጋጃችሁበት ጊዜ ነበር ወይ ?	0=የ ለም 1=አዎ	0 ከሆነ ወደ ጥያቄ 406 እለፍ
505 a	አዎ ከሆነ ይሄ ችግር ካለ ለስንት ጊዜ ነ ው ያጋጠማቸሁ?	1=በ ተወሰነ ጊዜ (ባለፉት አራት ሳምንታት ውስጥ 1 ጊዜ ወይም2 ጊዜ) 2=አንዳንድ ጊዜ (ባለፉት አራት ሳምንት ውስጥ 3 ጊዜ ወይም10 ጊዜ) 3=ብዙ ጊዜ (ባለፉት አራት ሳምንት ውስጥ ከ 10 ጊዜ በላይ)	
506	ባለፉት አራት ሳምንታት ውስጥ ከእናንተ ወይም ከቤተሰብ አባላት ውስጥ በቂ ምግብ በቀን በ ተወሰነ ጊዜ ብቻ ለመማ ብ ተገ ዳችሁ ነበር ?	0=የ ለም 1=አዎ	0 ከሆነ ወደ ጥያቄ 407 እለፍ
506 a	አዎ ከሆነ ይሄ ችግር ካለ ለስንት ጊዜ ነ ው ያጋጠማቸሁ?	1=በ ተወሰነ ጊዜ (ባለፉት አራት ሳምንታት ውስጥ 1 ጊዜ ወይም2 ጊዜ) 2=አንዳንድ ጊዜ (ባለፉት አራት ሳምንት ውስጥ 3 ጊዜ ወይም10 ጊዜ) 3=ብዙ ጊዜ (ባለፉት አራት ሳምንት ውስጥ ከ 10 ጊዜ በላይ)	
507	ባለፉት አራት ሳምንታት ውስጥ ብር ወይምሀብት ስለሌላችሁ የ ትኛውንምየ ምግብ ዓይነ ት ከቤተሰባችሁ ውስጥ ያጣችሁበት ጊዜ አለ ወይ?	0=የ ለም 1=አዎ	0 ከሆነ ወደ ጥያቄ 408

			እለፍ
507 a	አዎ ከሆነ ይሄ ችግር ካለ ለስንት ጊዜ ነ ው ያጋጠሞችሁ?	1=በተወሰነ ጊዜ (ባለፉት አራት ሳምንታት ውስጥ 1 ጊዜ ወይም2 ጊዜ) 2=አንዳንድ ጊዜ (ባለፉት አራት ሳምንት ውስጥ 3 ጊዜ ወይም10 ጊዜ) 3=ብዙ ጊዜ (ባለፉት አራት ሳምንት ውስጥ ከ 10 ጊዜ በላይ)	
508	ባለፉት አራት ሳምንታት ውስጥ ሞቃሞቃ እና ንተ ወይምየ ቤተሰብ አባላት ውስጥ በቂ ምግብ ስለሌለ ለረሀብ ወይምበ ባዶ ሆድ ለ ሙተኛ ት የ ተገ ደዳችሁበት ጊዜ ነ በር ወይ?	0=የ ለ ም 1=አ ዎ	0 ከሆነ ወደ ጥያ ቄ 409 እለፍ
508 a	አዎ ከሆነ ይሄ ችግር ካለ ለስንት ጊዜ ነ ው ያጋጠሞችሁ?	1=በተወሰነ ጊዜ (ባለፉት አራት ሳምንታት ውስጥ 1 ጊዜ ወይም2 ጊዜ) 2=አንዳንድ ጊዜ (ባለፉት አራት ሳምንት ውስጥ 3 ጊዜ ወይም10 ጊዜ) 3=ብዙ ጊዜ (ባለፉት አራት ሳምንት ውስጥ ከ 10 ጊዜ በላይ)	
509	ባለፉት አራት ሳምንታት ውስጥእና ንተ ወይም ከቤተሰብ አባላት ውስጥ ሞቃ እና ቀን በሚራብ ወይምባዶ ሆድ ለ ሜቆየ ት የ ተገ ደዳችሁበት ጊዜ ነ በር ወይ?	0=የ ለ ም 1=አ ዎ	0 ከሆነ ወደ ክፍል 5 እለፍ
509 a	አዎ ከሆነ ይሄ ችግር ካለለ ስንት ጊዜ ነ ው ያጋጠሞችሁ?	1=በተወሰነ ጊዜ (ባለፉት አራት ሳምንታት ውስጥ 1 ጊዜ ወይም2 ጊዜ) 2=አንዳንድ ጊዜ (ባለፉት አራት ሳምንት ውስጥ 3 ጊዜ ወይም10 ጊዜ) 3=ብዙ ጊዜ (ባለፉት አራት ሳምንት ውስጥ ከ 10 ጊዜ በላይ)	
ክፍል ስደስት፤ -የ ልጆች ክብደት እና ቁመት የ ሚያስ ሱ			

601	የ ክ ብደ ት ማ ከ ን በ ኪ ሎ ግ ራ ም		
602	የ ቁ ማ ት ማ ከ ን በ ሳ ን ቲ ሜ ት ር		
603	እ ድ ሜ (በ ወ ር እ ና በ ኣ ማ ት)		
604	የ ክ ን ድ ዙ ያ (በ ሳ ን ቲ ሜ ት ር)		

8.5 Oromfa Version Questionnaires

Guyyaagaafif Deebisaanitti Gaggeyfame	**Guyyaa**		**Jilaa**		**Bara**			
					2	0	1	8
Fayyaa Addnnyatii								
LakkAddaa Iddoo								
Raga Guuraa/Tuu	Maqaa			Mallattoo				
Too Ataa	Maqaa			Mallattoo				

Kuttan Taka Ware Uumataafi Hawwasuuna Odeefanoo Argachua Kan Kophaneo			
Codii Lakkofsa	Jijiraamaa	Kuttan	Ibsaa
101	Umurii	————————————	
102	Korniyan/sala	1.Dhiraa 2.Dhalaa	
103	Amantan	1.Orthodoox 2.Muslim 3.Protestant 4.Katolik 5.Kanbiira ————	
104	Sabaa	1. Orormo 2. Amhara 3.Harari 4.somali 5. Tigrai 6.Kanbira ————	
105	Bakka Jireenyaan	1.Anaa 2.Magalaa	
106	Haala Matii	1.Huundumtii Lubuun Jiruu 2.Hadhaa Lubuun Jiruu 3.Abaa Lubuun Jiruu 4.Huundumtii Lubuun Hinjiran 5.Gaargaar Kan Bahaan	
107	Nama Kunuunsuu Qabanii?	1.Qabaan 2.Hinqabaan	Yoo hinjiruu tae garaa 108 darbii

1071	Enyuutu Kunuunsaa?	1.Abaa Ykn Hadhaa 2.Abootii Amaantii 3.Hadhaa Manaa 4.Abaa Manaa 5.Nama Biraa	
108	Waa'ee Nyaataa Goorsaaisiniif nikeenamaa?	1.Nikeenamaa 2.Hinkeenamuuf	
109	Galii Matiin Ji'aan Meeqaa Ta'a ?	_____	
110	Bishaan dhugamu eessaa argattu?	1. Ujummoodhaan 2. Bishaan bolla/ kan dallaa qaqu 3. Bishaan lagaa/kan dallaa hin qabne 4. Kan biro (himi)	
111	Mana fiincaanii dhuunfaa ni qabduu?	1. Eeyyeen 2. Lakkii	
Kuttan Lamafa :- Qooraana Qamaa Fi Rakoolee Nalqaabatan Addan Basuuf Kan Qophaae			
201	Yeroo Qoricha /Dawaa/HIV/Adis Fooyadaamfaan Ykn Fudhootaa Dawaa/Qorichaa Bita Nyooten Qophacee Nifaayadamtaa /Nifudhaata/?	----------	
202	Rakoo Gaara Nyatatiin Nijiraa ?	1.Nijirraa 2.Hinjiruu	Hinjiruu Yoo Tae Garaa 203 Darbii
2021	Makoo nyataa kan akaamiituu jiraa ?	1.feedhinaa nyataa hirisuu 2.makinaa liqimsuu 3.makinaa ool jachuu 4.yoo kan biraa jiraatee	
203	Makinoo Fayaa Garabiiraa Yoo Qabatee ?	1.Niqabaa 2.Hinqabuu	Hinjiruu yoo tae

			garaa 204 darbii
2031	Makinaa Fayaa Kan Akamii Qabuu ?	1. Michii Sobaa 2. 3.GaadiiYaasuu 4.Dhuukubaa Kaluu 5.Ccuumaa Yaasuu 6.Kanbiraa Yoo Jirratee	
204	Dhukkubni konirreaffi mulatee waggaa meeqaafi ?		
205	Akka dhabataa gamtaafayyaa addnnyattii dhukkabni HIV/AIDS sadaorka meeqaata irraathi argamaa?		
206	Ergaa Dawaa Fudhaachuu Jalqabee Hamaan Taa		
207	Dawaa Osoohinjalkabiin hangaam tekkoof furee/fte ?		
208	Dawaa eergaa jalqabee hangaam takkaaf/ffee?		
209	Hamaa Himooglobin Miligiraamii Dhan ?		
210	Duraan CD4 Hamaa Turee ?		
211	Amaa CD4 Hamaa Jiraa ?		
212	Fudhiinsaa Dawaa HIV Hamaa Fakatuu ?	1.Garii 2.Walakaa 3.Gadiilana	
213	Daa'ima kee kana harma hoosiisuu erga jalqabdee ji'a meeqa?	1. Baatii Jahaa gadi 2. Baatii tahaa hanga kudha tokkoo 3. Baatii kudha lama hanga digdami afurii 4. Baatii Afurii olii 5. Hin beeku	

214	Daa'ima kee kanaaf nyaata/ dhangala'aa dabalataa ni keennitaa?	1. Eeyyeen 2. Lakki	Yoo 2 tahe, →216
215	Umuriin daa'ima keetii yeroo nyaata/ dhangala'aa dabalataa kennuuf eegaltee meeqa ture?	1. Baatii jahaa gadii 2. Baatii jahaayeroo taheeti 3. Baatii Jahaa olii 4. Hin beekuu	
216	Torban lamaan darban keessatti dhibeen garaa kaasaa si quunnamee turee?	1. Eeyyeen 2. Lakki	

Kutaa III: Gaaffiilee haala soorata Da'immaani ilaallatan

Seensa: Sa'atii 24 darbe keessatti manattis tahe manaan alatti akaakuuwwan nyaataa gaaffii lakkoofsa 301- 315 tti eeraman keessaa isa kam akka haati soratte ibsuuf gaafadhu. akaakuuwwan nyaataa caqasaman keessaa yoo tokko isaa soratteetti tahe, fuuldura akaakuuwwan nyaataa eeraman bira (bakka deebii jedhutti) lakkoofsa 1 barressi.

Lakk.	**Akakuu nyaataa**	**Deebii Eeyyeen(1) Lakki (0)**
301	Buddeena,daabboo, akaayii, marqaa, ruuzii, biskutii yookan akakuu nyaataa biroo midhaan dheedhii naannotti omishaman kan akka; misingaa, garbuu, aajjaa, boqolloo, qamadii, taafii fi k.k.f. irraa hojjetaman	
302	Dinnicha, mixaaxisii yookan nyaata walfakkaataa biroo hiddi isaanii nyaatamu	
303	Kuduraalee vitaminii 'A' dhaan badhaadhan kan akka dubbaa, kaarootii	
304	Kuduraalee baala magarisaa kan akka goommana, salaaxaa	
305	Kuduraalee fi fuduraalee kan biro kanneen akka timaatimii, qullubbii, loomii	
306	Fuduraalee vitaaminii 'A' dhaan badhaadhan kan akka avokaadoo, maangoo, pappaayyaa, muuzii ykn juusa fuduraalee kana irraa qophaa'e	
307	Foon qaama horii kan akka kalee, onnee yookin kan biro	
308	Foon horii, jabbii, hoolaa, re'ee, lukkuu,	

309	Hanqaaquu/killee	
310	Qurxummii/sardiinii	
311	Nhaata kamiyyuu kan atara, baaqelaa, lawzii, missira, shumburaa irraa hojjeteme	
312	Itittuu, ayibii, aannan, yookin omisha aannanii kan biroo	
313	Nyaata zayita, cooma yookin dhadhaa qabu	
314	Sukkara yookin damma	
315	Nyaata biro kan akka shayii, buna, soogidda, mi'eessituu, alkoolii	

Kutaa IV: Gaaffiilee haala wabii nyaataa ilaallatan

lakk	Gaaffii	deebii (tokko filadhu)	utaali
401.	Torban afran darban keessatti maatiin keessan nyaata gahaa hin qabu ykn jalaa dhuma jechuun yaaddooftanii turtanii?	0 = lakki 1=Eeyyeen	Yoo 0 tahe, → 402
401.a	Yaaddoon armaan olii kun al meeqa isiin mudatee?	1 = Yeroo muraasa (baatii darbetti al 1- 2 tti) 2 = Al tokko tokko (baatii darbetti al 3- 10 tti) 3 = Yeroo hedduu (baatii darbetti yeroo 10 nii ol)	
402.	Torban afran darban keessatti isin ykn miseensi matii keessanii qarshii/ qabeenya dhabuun nyaata filattan osoo hin nyaatiin haftanii jirtuu?	0 = lakki 1=Eeyyeen	Yoo 0 tahe, → 403
402.a	Rakkoon armaan olii kun yoo jiraate al meeqa isin mudatee?	1 = Yeroo muraasa (baatii darbetti al 1- 2 tti) 2 = Al tokko tokko (baatii darbetti al 3- 10 tti) 3 = Yeroo hedduu (baatii darbetti yeroo 10 nii ol)	
403	Torban afran darban keessatti isin ykn miseensi matii keessanii qarshii/ qabeenya dhabuun akaakuu nyaataa muraasa qofaa nyaachuuf yeroon itti dirqamtan jira turee?	0 = lakki 1=Eeyyeen	Yoo 0 tahe, → 404
403.a	Rakkoon armaan olii kun yoo jiraate al meeqa isin mudatee?	1 = Yeroo muraasa (baatii darbetti al 1- 2 tti) 2 = Al tokko tokko (baatii darbetti al 3- 10 tti) 3 = Yeroo hedduu (baatii darbetti yeroo 10 nii ol)	
404	Torban afran darban keessatti isin ykn miseensi matii keessanii qarshii/ qabeenya dhabuun	0 = lakki	Yoo 0 tahe,

	nyaata nyaachuu hin feene nyaachuuf yeroon itti dirqamtan jira turee?	1=Eeyyeen	→405
404.a	Rakkoon armaan olii kun yoo jiraate al meeqa isin mudatee?	1 = Yeroo muraasa (baatii darbetti al 1- 2 tti) 2 = Al tokko tokko (baatii darbetti al 3- 10 tti) 3 = Yeroo hedduu (baatii darbetti yeroo 10 nii ol)	
405	Torban afran darban keessatti isin ykn miseensi matii keessanii nyaanni gahaan wan hin jirreef nyaata hanga sorachuu barbaaddaniin gaditti sorachuuf yeroon itti dirqamtan jira turee?	0 = lakki 1=Eeyyeen	Yoo 0 tahe, → 406
405.a	Rakkoon armaan olii kun yoo jiraate al meeqa isin mudatee?	1 = Yeroo muraasa (baatii darbetti al 1- 2 tti) 2 = Al tokko tokko (baatii darbetti al 3- 10 tti) 3 = Yeroo hedduu (baatii darbetti yeroo 10 nii ol)	
406	Torban afran darban keessatti isin ykn miseensi matii keessanii nyaanni gahaan wan hin jirreef guyyaatti yeroo muraasa qofa sorachuuf yeroon itti dirqamtan jira turee?	0 = lakki 1=Eeyyeen	Yoo 0 tahe, → 407
406.a	Rakkoon armaan olii kun yoo jiraate al meeqa isin mudatee?	1 = Yeroo muraasa (baatii darbetti al 1- 2 tti) 2 = Al tokko tokko (baatii darbetti al 3- 10 tti) 3 = Yeroo hedduu (baatii darbetti yeroo 10 nii ol)	
407	Torban afran darban keessatti qarshiin/ qabeenyi waan hin jirreef nyaata akaakuu kamiyyuu mana keessaa yeroon itti dhabdan ni jira turee?	0 = lakki 1=Eeyyeen	Yoo 0 tahe, → 408
407.a	Rakkoon armaan olii kun yoo jiraate al meeqa isin mudatee?	1 = Yeroo muraasa (baatii darbetti al 1- 2 tti) 2 = Al tokko tokko (baatii darbetti al 3- 10 tti) 3 = Yeroo hedduu (baatii darbetti yeroo 10 nii ol)	
408	Torban afran darban keessatti galgala galgala isin ykn miseensi matii keessanii nyaanni gahaan wan hin jirreef beela'aa ykn garaa duwwaa ciisuuf yeroon itti dirqamtan jira turee?	0 = lakki 1=Eeyyeen	Yoo 0 tahe, → 409
408.a	Rakkoon armaan olii kun yoo jiraate al meeqa isin mudatee?	1 = Yeroo muraasa (baatii darbetti al 1- 2 tti) 2 = Al tokko tokko (baatii darbetti al 3- 10 tti)	

		3 = Yeroo hedduu (baatii darbetti yeroo 10 nii ol)		
409	Torban afran darban keessatti isin ykn miseensi matii keessanii nyaanni gahaan waan hin jirreef galgalaa fi guyyaa guutuu beela'aa ykn garaa duwwaa yeroon itti turuuf dirqamtan jira turee?		0 = lakki (Questionnaire finished) 1=Eeyyeen	Yoo 0 tahe,→ kutaaV
409.a	Rakkoon armaan olii kun yoo jiraate al meeqa isin mudatee?	1 = Yeroo muraasa (baatii darbetti al 1- 2 tti) 2 = Al tokko tokko (baatii darbetti al 3- 10 tti) 3 = Yeroo hedduu (baatii darbetti yeroo 10 nii ol)		

Kuttaa V:-			
501	Hamaa Ulfiina K.Gramiin	————————	
502	Humaa Dherinaa C.M Riidhaan	————————	
503	Umurii	————————	
504	Ciqilledhan(senti metiridhaan)		

8.6 Somalia version Questionnaire

Taariikhda waraysi	Taariikhda		Bishii		Year			
					2	0	1	8
Magaca Hay'adda ee								
tirada Code								
Waraysi eeyam			Saxiixa					
Kor-joogahyam			Saxiixa					

Qayb I: Society deegaanka iyo Astaamaha Dhaqaalaha			
Code .Ma	**Doorsoomayaasha**	**Category**	**Tacliiq**
101	Falniin (bilood)	_____	
102	Sex	1. lid 2. dhaddig	
103	Diinta	1. Orthodox 2.Muslimiinta 3. Protestant 4. Catholic 5. Qaar kale waxay_____	
104	Asalka	1. Oromo 2. Amharic 3. Harari 4. Somali	

		5. Tigrai 6. Qaar kale waxay_____	
105	Daganaanshada	1. Miyiga 2. magaalooyinka	
106	Xaaladda waalidka	1. Labada nool 2. Hooyo dhintay 3. Aabbaha ku dhintay 4. Labada dhintay 5. Kala / furayna	
107	Ma jiraa kan daryeelka?	1. HAA 2. No.	Haddii aan la helin108
1071	Uu / il iyada kan daryeelka.	1. Hooyada / aabbihiis 2. Aabbihiis Diinta 3. Xaaska 4. Sayga 5. Carruurta 6. Qaar kale waxay _____	
108	Ma waxaad ka heli raashinku La-talinta?	1. HAA 2. No.	
109	Dakhliga bil kasta qoyska (ee Birr)	_____	
110	Source of biyaha la cabbo	1. tuuboyinka 2. sidoo Protected 3. River / balli / sidoo galmo	

		4. Xusuuso Kale	
111	helitaanka musqul qoyska	1. Haa 2. No	
Qaybta II: Caafimaadka iyo Sifooyinka kale ee la xiriira			
201	Jiritaanka cunto ku daweynta Inta lagu guda jiro koorsada daawada ART	1. HAA 2. No	
202	Jiritaanka dhibaatooyinka cunidda	1. HAA 2. No	Haddii aan la helin 203
2021	Nooca dhibaatooyinka cunidda	1. Rabitaanka cuntada oo luma 2. Dhib liqidda 3. Matag 4. Qaar kale waxay	
203	Jiritaanka cudur fursad	1. HAA 2. No	haddii aan la helin 204
2031	Nooca cudurka fursad	1. Pneumonia 2. Qaaxada 3. Cudurka shubanka 4. Cudurada maqaarka 5. Calool enteritis 6. Qaar kalewaxay_____	
204	da'da marka horecudurka HIV (ee sanadka)	_____	
205	WHO stage caafimaad	_____	

206	Duration Caabuqa HIV ka muddo of diagnosis	_____	
207	Duration of pre-ART dabagal	_____	
208	Duration ee daawada ART daba-	_____	
209	Raac-up bareeg daaweynta ART	_____	
210	Heerka haemoglobin ee mg / dL	_____	
211	Line Base CD4 count	_____	
212	CD4 hadda	_____	
213	La raaco ee daroogada	1. Wanaagsan 2. Cadaalad 3. Saboolka ah	
214	Waayo, bal sidee leeg ayaad naaska ilmahaaga?	1. <6 bilood 2. 6-11 bilood 3. 12-24 bilood 4.> 24 bilood 5. Anigu garan maayo	
215	Ha ku siin cunto dheeraad ah si ilmaha aad hadda?	1. HAA 2. No	Haddii 2, si Q. 217
216	Haddii ay haa tahay si Q. 215, waxa da'da aad bandhigo cuntooyinka additib inka ilmahaaga?	1. <6 bilood 2. at 6 bilood 3.> 6 bilood 4. Anigu garan maayo	
217	Ma waxaad la kulmi shuban	1. HAA	

	labadii todobaad ee la soo dhaafay?	2. No	

Qaybta III: Su'aalaha si ay u qiimeeyaan sida hannaankii isticmaalka cuntada carruurta

Waxbarashada:. Waydii hooyada in ay Yeeray dhan cuntooyinka iyo sharaabka baabbi'iyey shalay lagu jiro maalintii iyo habeenkii, haddii guriga ama guriga ka baxsan, ka xariiqay cuntooyinka u dhiganta in liiska hoos group cunto ku habboon iyo ku qor "1" ee qaybta soo socota koox cuntada haddii ugu yaraan mid ka mid ah cuntada ee kooxdan ayaa hoosta ka xariiqay. Marka xusa la dhammeeyo, oo baaraya kooxaha cuntada meesha cuntada lama hoosta ka xariiqay.

Q. No	**kooxood oo cunto ah**	**Response Haa (1) Maya (0)**
301	Injera, kitą, qollo, pourage, kibis, bariis, buskud, ama cuntooyinka kale ka masago sameeyey, oo kali ah, sareeen, masagada, galayda, bariiska, sarreenka, ama-malyuun	
302	Baradhadu, baradhada macaan, Coofeega, kasaafada ama cuntooyinka kale oo xididdada ama tubers	
303	Vitamin A khudaarta hodanka ah iyo tubers sida Bocor, karooto, ama baradho macaan sameeyey, basbaas macaan cas	
304	khudaarta caleenta cagaaran Dark sida kaabajka, salaar , isbinaajka?	
305	miraha kale iyo khudaarta sida yaanyada, basasha, liin	
306	vitamin kasta A miraha hodan sida avocado, cambe, babaygu ama muuska iyo 100% juice midho ka	
307	Beerka, kalyaha, wadnaha ama xubnaha kale ee hilibka ama cuntada dhiig ku salaysan	
308	kasta oo lagu sameeyo hilibka lo'da, iyo wan yar, riyaha, digaaga, ama shimbiraha kale, beerka	
309	kasta ukunta	
310	Kasta oo kalluunka cusub ama sabiib ama shellfish	
311	cuntooyinka kasta oo ka digir, digir, digir, ama nuts dhigay	
312	cheese kasta, yogurt, caano ama alaabooyinka kale ee caanaha	
313	cuntooyinka kasta saliiddii, baruurta, ama subagga la barwaaqoobi	

314	sonkorta kasta ama malab	
315	cuntooyinka kasta oo kale oo la, sida Iidaanka, qaxwada, shaaha, orso maxaliga ah, khamriga?	

Qaybta IV: Su'aalaha si ay u qiimeeyaan xaaladda hubinta cuntada ee qoyska (HFIAS)

Q. No	**Su'aalaha**	**fursadaha Response (hareerayn mid)**	**boodboodaan**
401.	In afartii toddobaad ee la soo dhaafay, ma waxaad ka walwalaan in qoyskaaga haysan lahaa cunto ku filan?	0 = No 1 = Haa	Haddii 0, Q 402
401.a	Imisa jeer ayey dhacday?	1 = dhif ah (1X ama 2x in afartii toddobaad ee la soo dhaafay) 2 = Mararka qaarkood (3x inay 10x in afartii toddobaad ee la soo dhaafay) 3 = Inta badan (> 10x in afartii toddobaad ee la soo dhaafay)	
402.	. In afartii toddobaad ee la soo dhaafay, adiga ama kuwo wax xubin reerka ma awoodaan in ay cunaan noocyada cuntooyinka idinka fadilay sababta oo ah la'aanta khayraadka?	0 = No 1 = Haa	Haddii 0, Q 403
402.a	Imisa jeer ayey dhacday?	1 = dhif ah (1X ama 2x in afartii toddobaad ee la soo dhaafay) 2 = Mararka qaarkood (3x inay 10x in afartii toddobaad ee la soo dhaafay) 3 = Inta badan (> 10x in afartii toddobaad ee la soo dhaafay)	
403	In afartii toddobaad ee la soo dhaafay, uu idiinku sameeyey ama guri kasta xubin u leeyihiin in ay cunaan kala duwan kooban oo cuntooyinka ay sabab u la'aanta ah ee khayraadka?	0 = No 1=Haa	Haddii 0, Q 404
403.a	Imisa jeer ayey dhacday?	1 = dhif ah (1X ama 2x in afartii toddobaad ee la soo dhaafay) 2 = Mararka qaarkood (3x inay 10x in afartii toddobaad ee la soo dhaafay) 3 = Inta badan (> 10x in afartii toddobaad ee la	

		soo dhaafay)		
404	In afartii toddobaad ee la soo dhaafay, uu idiinku sameeyey ama guri kasta xubin u leeyihiin in ay cunaan qaar ka mid ah cuntooyinka runtii aad ma doonayaan in ay cunaan aawadeed la'aan khayraadka si aad u hesho noocyada kale ee cuntada?		0 = No 1=Haa	Haddii 0, Q 405
404.a	Imisa jeer ayey dhacday?	1 = dhif ah (1X ama 2x in afartii toddobaad ee la soo dhaafay) 2 = Mararka qaarkood (3x inay 10x in afartii toddobaad ee la soo dhaafay) 3 = Inta badan (> 10x in afartii toddobaad ee la soo dhaafay)		
405	In afartii toddobaad ee la soo dhaafay, uu idiinku sameeyey ama guri kasta xubin u leeyihiin in ay cunaan cuntada ka yar aad dareemay aad loogu baahan yahay, sababtoo ah ma jirin cunto ku filan?		0 = No 1=Haa	Haddii 0, Q 406
405.a	Imisa jeer ayey dhacday?	1 = dhif ah (1X ama 2x in afartii toddobaad ee la soo dhaafay) 2 = Mararka qaarkood (3x inay 10x in afartii toddobaad ee la soo dhaafay) 3 = Inta badan (> 10x in afartii toddobaad ee la soo dhaafay)		
406	In afartii toddobaad ee la soo dhaafay, adiga ama kale sameeyey xubin reerka u leeyihiin in ay cunaan cunto yar ee maalin sababta oo ah ma jirin cunto ku filan?		0 = No 1=Haa	Haddii 0, Q 407
406.a	Imisa jeer ayey dhacday?	1 = dhif ah (1X ama 2x in afartii toddobaad ee la soo dhaafay) 2 = Mararka qaarkood (3x inay 10x in afartii toddobaad ee la soo dhaafay) 3 = Inta badan (> 10x in afartii toddobaad ee la soo dhaafay)		
407	In afartii toddobaad ee la soo dhaafay, waxaa jiray abid cunto ma inay cunaan nooc kasta ee ku nool gurigaaga sababta oo ah la'aanta		0 = No	Haddii 0, Q

	khayraadka si aannu cunto u heli karaa?	1=Haa	408
407.a	Imisa jeer ayey dhacday?	1 = dhif ah (1X ama 2x in afartii toddobaad ee la soo dhaafay) 2 = Mararka qaarkood (3x inay 10x in afartii toddobaad ee la soo dhaafay) 3 = Inta badan (> 10x in afartii toddobaad ee la soo dhaafay)	
408	In afartii toddobaad ee la soo dhaafay, uu idiinku sameeyey ama guri kasta xubin ka tagaan si ay hurdo habeenkii gaajaysan, maxaa yeelay, ma jirin cunto ku filan?	0 = No 1=Haa	Haddii 0, Q 409
408.a	Imisa jeer ayey dhacday?	1 = dhif ah (1X ama 2x in afartii toddobaad ee la soo dhaafay) 2 = Mararka qaarkood (3x inay 10x in afartii toddobaad ee la soo dhaafay) 3 = Inta badan (> 10x in afartii toddobaad ee la soo dhaafay)	
409	In afartii toddobaad ee la soo dhaafay, uu idiinku sameeyey ama guri kasta xubin ka tagaan habeen iyo maalin dhan oo aan wax cunaya wax maxaa yeelay, waxaa jiray oo aan cunto ku filan?	0 = No (Su'aalaha ku dhameysatay) 1=Haa	Haddii 0, Qaybta V
409.a	Imisa jeer ayey dhacday?	1 = dhif ah (1X ama 2x in afartii toddobaad ee la soo dhaafay) 2 = Mararka qaarkood (3x inay 10x in afartii toddobaad ee la soo dhaafay) 3 = Inta badan (> 10x in afartii toddobaad ee la soo dhaafay)	

Qaybta V: Qiyaasaha jirka			
501	Miisaanka of macmiilka (in kg)	_____	
502	Dhererka of macmiilka (in cm)	_____	
503	Falniin(bilaha iyo / ama sano)	_____	
504	Bartamihii Cududda sare (in cm)	_____	

8.6 Curriculum Vitae

BETELIHEM H/SELASSIE

Mobile: 0948630142

Email: Bettywhite726@gmail.com

1. personal data
    - Full name: Betelihem h/selassie
    - Date of birth:27/1/1985e.c
    - Nationality: Ethiopia
    - Marital status: single
    - Address: Jigjiga, mobile phone 0948630142
2. Educational back ground

1. EDUCATIONAL BACKGROUND

I. High School

Name of school: Magic Carpet Mekelle branch from 2000-2004e.c

Place: Mekelle , Ethiopia

Kind of education: Academic stream

Award: Certificate

II. Higher Education

1. Type of education: BSc degree In Generic Nursing
   Institution: Jigjiga Uninersity

   Place: Jigjiga, Ethiopia

   Award: Bachelor of Science degree in Nursing
2. MPH in Nutrition candidate in Haromaya University

3. Language skill

language	listening	speaking	reading	Writing
Tigrigna	excellent	excellent	excellent	Excellent
Ahmaric	excellent	excellent	excellent	Excellent
English	excellent	excellent	excellent	Excellent

2. **Work experience**
    - 1/04/2008e.c-till now I am working as assistance Lecturer in Jigjiga University, health science collage, public health department.
        - Academic & research team staff of Jigjiga University
        - Data collection with UNICF and WHO as independent monitor and LQS during polio, Measles and TT vaccine campaign
        - Quantitative and qualitative research project data collection with different institutions
        - Academic staff (teaching) in private health colleges as part-timer and delivered the following Public Health courses like: CDC, and child health nursing, obstratrics and gynecology.
        - Advising Research for Health science students.
        - Taking training on effective teaching skill for Jigjiga University instructors
        - Assisting students during team training program in delivering in EPI and EOS activities in Gursume Woreda, East Hararge and diredawa.
3. **Training**
    - Research Methodology by jigjiga university in collaboration with gender office,2009e.c
    - Effective teaching skill
4. **Other skill**
    - Excellent Communication Skill and good team worker.
    - Excellent computer skill (MS-Office)
    - Skill with Statistical software including SPSS, STATA, EPI-DATA & EPI-INFO for advanced research analysis and data entry.
5. **Membership**
    - Ethiopian public health association (EPHA)
    - Ethiopian Nurse association
    - SWIST
6. **Hobbies**
    - Reading magazine, watching movies, foot ball and follow current information.
    - Research specialization in field and working on public health problem
7. **Research**
    - Assessment of KAP breast cancer and associated factors among jigjiga female students,2009
    - Assessment of KAP regarding emergency contraceptive among jigjiga female students,2007e.c

8. Reference

- Ato Frew Taddesse Lecturer at Jijiga university FOHS, department of public health. Phone: 0913782429
- Amanuel h/selassie, work at MOH, Phone: 0914732100

9. Enclosure

- Letter to MOH, student copy, Recommendation latter, grade report and CV.