ADDIS ABABA UNIVERSITY

COLLEGE OF NATURAL AND COMPUTATIONAL SCIENCES

CENTER FOR FOOD SCIENCE AND NUTRITION

Undernutrition and associated factors Among HIV Positive Children aged below 15 years in selected Governmental Hospitals-Addis Ababa.

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A THESIS SUBMITTED TO ADDIS ABABA UNIVERSTY, COLLEGE OF NATURAL AND COMPUTITIONAL SCIENCES, IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF SCIENCES IN COMMUNITY NUTRITION

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Thesis Approval

This is to certify that the thesis prepared by TEKLU ASSEFA, entitled: 'Undernutrition and associated factors Among HIV Positive Children Aged below 15 years in selected Governmental Hospitals-Addis Ababa. Submitted to Addis Ababa University College of Natural and Computational Science Center For Food Science and Nutrition, Community Nutrition Program in partial fulfillment for the requirements of Master of science in community nutrition complied with the regulations of Addis Ababa University and meet the accepted standards with respect to originality and quality.

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Declaration

I, the undersigned, declare that the 'Nutritional Status and associated factors Among HIV Positive Children below 15 years in selected Governmental Hospitals-Addis Ababa.' is my original work and has not been presented for a degree in any other university, and that all sorts of materials used for this thesis have been duly acknowledged.

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Abbreviations and Acronyms

AIDS	Acquired Human Immune Deficiency Syndrome
ART	Antiretroviral Therapy
BAZ	BMI for Age Z score
BMI	Body Mass Index
CD4	Cluster differentiation 4
E.C.	Ethiopian Calander
EDHS	Ethiopian Demographic health Servay
FANTA	Food and Nutrition Technical Assistant
FAO	Food and Agriculture Organization
G.C.	Gregorian Calander
HAZ	Height for age Z score
HFA	Height for Age
HIV	Human Immune Virus
MAM	Moderate Acute Malnutrition
OIS	Opportunistic Infections
PLHA	People Living with HIV AIDS
RCQHC	Regional Center for Quality of Health Care
SAM	Sever Acute Malnutrition
TB	Tuberclosis
UNICEF	United Nation International Child Emergency Fund

WAZ	Weight for Age Z score
WB	World Bank
WFA	Weight for Age
WFH	Weight for Height
WHO	World Health Organization
WHZ	Weight for Height Z score

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Abstract

Background: The term Malnutrition is strongly associated with children living with HIV AIDs, but it has not been well characterized in Ethiopia,which is likely to introduce a gap in the health care services provided to them.

Objectives: This study proposed to assess undernutrition and associated factors among HIV positive children aged below 15 years attending in selected government Hospitals in Addis Ababa, Ethiopia.

Method; Institution based cross-sectional study was conducted among 238 HIV positive children below 15 years, who receive ART services in three selected Governmental hospitals. Systematic random sampling was used to select the study participant. Data was collected using structured questionnaire, through measurement of weight, height as well as MUAC, and through revision of medical record of the children. Data were analyzed using both univariate descriptive statistics and multivariate method.

Results and discussion :The prevalence of stunting and wasting were 28.60% (95%CI:22.9%-34.8%) and 26.5% (95%CI:21.0%-32.6%) respectively. Variable like living with the virus for 5-10years [AOR=2.26 ,95%CI: 1.07-4.77], Family income <1500 [AOR=0.4, 95%CI: 0.19-0.90] and having snack [AOR= 2.11, 95% CI: 1.15-3.86] showed significant association with stunting. On the other hand, having no regular dinner [AOR=0.39,95% CI:0.17-0.0.92] and eating problem [AOR= 0.52 ,95%CI: 0.28-0.98] were significant association with wasting.

Conclusion and recommendation: The prevalence of stunting and wasting were significant among the children. Having monthly family income below 1500, staying with HIV for 5-10 years, and having no snack were important predictor of stunting. On the other hand, having no regular dinner, and eating problem were important predictors of wasting. Considering poor nutritional status among HIV positive children aged below 15 years, interventions targeting family income, frequent consumtion of food and eating problems are needed.

Key words: stunting, wasting, PLHIV, children below 15, Addis Ababa,Ethiopia.

Chapter one

1. Introduction

1.1. Back ground

According to WHO definition, malnutrition is the cellular imbalance between supply of nutrients and energy the body demand for them to ensure growth, maintenance and specific purpose. It is a greatest risk factor for illness and death worldwide(1) and has a serious effect on morbidity and mortality(2). According to the 2020 Global nutrition report, 1 in 9 people, (820 million) worldwide, specially in the poorest countries like Africa, West Asia, and Latin America are malnourished. In developing countries, the rate is 10 times higher when compared to the richest contries(3). Nearly 113 million people out of 53 countries face acute hanger as a result of conflict, food insecurity, climate change, economic instability and diseases(3).

Undernutrition disproportionately affects children from developing countries(4). Particularly those who live with HIV(5).The problem results in poor cognitive and social development, reduce productivity, economic growth, and wasted human capital. It is also, responsible for immune suppression, that facilitates infection in children as a result of weak immune system(6). Thus, undernutrition gets worst when combined with HIV that results in reduced food intake resulting from poor appetite, poor absorption of nutrients that may be result of recurrent or chronic diharrhea or HIV caused intestinal cell damage, increased energy demand as a result of virus replication and because of opportunistic-infections (7-9).

However, HIV affects large number of children worldwide. In South Africa, for example, 2.1 million under 15 children live with HIV(10), which is likely to put the children at risk of malnutriton. Different studies conduct in Asia indicated high prevalence of stunting, 78.3% (westernIndia) (11), 33.2% (ElSalvador) (12), 55%(Kolkata) (13), and 58% (southern India) (14). In sub-Saharan Africa, a higher proportion of underweight, stunting and wasting has been observed among children with HIV/ AIDS compared to those who were not affected by the virus(15). Also, according to a study done in Northern part of Ethiopia the overall prevalence of undernutrition among HIV positive children under 15, was 42.9% (14) while a study from Eastern Ethiopia indicated 21.8% (wasted), and 13.4 (stunted) (1) children. The study reports above imply the variation in the magnitude of the problem in different regions even with in the same country like Ethiopia.

This calls for the need to do further investigation in different regions of the country that helps to plan an intervention. In addition, most of the previous studies, among HIV positive children, have been focusing on HIV therapy treatment outcomes (15) and determinant of chronic energy deficiency (16) in Ethiopia. Even the nutritional status of HIV positive children has not gotten attention in the EDHS report (17). EDHS presents nutritional status of children only based on area of residence, mother's education, wealth, and region (CSA, 2016). Also, there is insufficient information concerning determinants of undernutrition among HIV positive children unlike their HIV negative counter parts (18-20), which would otherwise help to indicate which variable to target to improve the situation, and that could be different from HIV negative counter parts. Furthermore PLHIV were not taken in to consideration in the recently developed Food and Nutrition policy document of the country, which might be because of insufficient information regarding the magnitude of the problem specially in cities like Addis Ababa where the prevalence of HIV is highest. Previous study from west Gojam Ethiopia, identified lack of media exposure and ownership of mobile cell phone as factors associated with malnutrition among HIV patients (16). But littile was said about the feeding habit, ART related factors, and opportunstic infection that requires further study.

1.2. Statement of the problem

Nearly 36 million people are living with HIV/AIDS worldwide, 25 million in Africa. In Ethiopia, close to 700,000 people live with HIV (21). The number of new HIV infections has decreased, from 29 000 to 23 000 in the year 2018 (21) in the country; however, there has been progress in the number of AIDS-related deaths since 2010. One of the reasons for the death could be undernutrition that works in tandem with HIV. In Sub-Saharan Africa an estimated 2 million under 15 children live with HIV and close to 2% of these children are living in Ethiopia (21). This is unfortunate given nutrition and HIV are powerfully associated and the infection has a significant impact on the nutritional status of children in particular (7)

HIV infection results in poor food intake as a result of poor appetite, eating difficulty, intestinal mal-absorption because of chronic diarrhea and infection caused intestinal cell damage, metabolic changes and increased nutrient requirements related to opportunistic infections(7, 9).

Malnutrition in child-hood has many adverse consequences for child survival and long term well-being(21).Children who are living with the Virus continue to be nutritionally challenged

because of low socio-economic status, orphan hood, food insecurity, poor dietary patterns, low maternal education and other specific health related factors (22). Chronic underlying poor nutritional status and its coexistance with food insecurity, poverty, and co-infections pose a serious risk to efforts to combat HIV/AIDS by denying access to a nutrition-rich diet, hindering the chance of good health outcomes.

Part of the solution to combat the problem could be generating location specific data on the size of the problem that would help to plan an intervention and decided where to give priority. Also, identifying factors associated with undernutrition among children with HIV will help to decide the variables that need to be targeted to improve the problem. Regrettably, the prevalence and the factors associated with undernutrition has not been characterized well in Ethiopia.

Ethiopia has one of the world highest incidences of malnutrition, approximately 49% of population lacks adequate nutrition, according to Food Association Organization (FAO, 2000), and around 1.5 million people in Ethiopia (4 % male & 5% female) had HIV, out of them 96,000 were children under 15 years old. In addition there were 25,000 new cases in the same year(9)

In our country context, there are guidelines and researches which discussed about under nutrition in different age groups. However, there is limitation of data among nutritional status of HIV positive children below 15 years.

1.3. Significance of the study

Under nutrition is one challenge in order to achieve the effectiveness of ART drugs among all age groups, specifically in children. On the other side poor adeherence can lead to sever immunodeficiency/opportunistic infections that has an impact on poor appetite and malabsorption and malnutrition. But there is little information about nutritional status of HIV positive children less than 15 years old in Ethiopia. On the other hand, such study was not conducted in Addis Ababa, previously. This study helps to fill this gap by assessing the prevalence of undernutrition and associated factors for those children living with the disease. The discovery helps government, policy makers and non-government organizations to focus on children with HIV/AIDS and provide holistic support.

It also helps the health care providers to be aware of their client's nutritional status including what they have to do through the finding and recommendation forwarded by this study. Not only that but also, such awareness decreases the burden of health care providers regarding to energy they lost, time they spent, stress they feel, illness they get from opportunistic infection among <15 years patient with HIV/AIDS. Finally, this study will be a base line for further studies.

Chapter Two

2. Literature review

2.1. Magnitude of the problem

In 2017, almost 36.9 million people worldwide were living with Human Immunodeficiency Virus, 1.8 million people were newly infected with HIV, and 9,40,000 people died from illnesses related to Acquired Immune Deficiency Syndrome, according to the WHO report.

There are an estimated 1.8 million children under 15 years of age living with HIV, of which 180,000 children were newly infected with HIV and 110,000 children died from AIDS-related illnesses(22). The prevalence of under-nutrition among HIV-positive children aged < 15 years was 29.2 percent (thin), 10.4 percent (severely thin), while 55 percent (stunted) and 24.8 percent were severely stunted, according to the Hindu study(23). In sub-Saharan Africa, the prevalence of HIV among children below 5 years of age was too high, complicating child malnutrition(22). The prevalence of undernutrition was 78.3 percent, according to an international journal of current research published in 2019. This study also highlighted: 68.8 percent, 19.4 percent and 27.8 percent respectively were stunting, wasting and under-nutrition in central and western Africa and India(22). In Tanzania, the prevalence of HIV-positive children in the ART clinic was 36.6% (stunted), 22.1% (underweight) and 13.6% (wasted) in the study(13). Some studies in Ethiopia have attempted to examine the prevalence of under-nutrition among HIV-positive children less than 15 years of age: one Gonder Ethiopia researcher concluded that the overall prevalence of under-nutrition using mid-upper arm circumference was determined to be 42.9% (14). The same research conducted in Adama, Ethiopia, and the prevalence of wasted and stunted among children < 15 years of HIV / AIDS is estimated to be 21.8 percent, 13.4 percent respectively (1).

2.2. Link between HIV/AIDS and nutrition

In terms of nutrition and HIV / AIDS, patients living with HIV are more likely to become malnourished and there is a complicated relationship between nutrition and HIV infection. Malnutrition can weaken the immune system, even without HIV. Undernutrition contributes to impairments of the immune system, leading the body to frequent diseases such as opportunistic infection and increasing demand for energy and nutrients(9, 24-26).

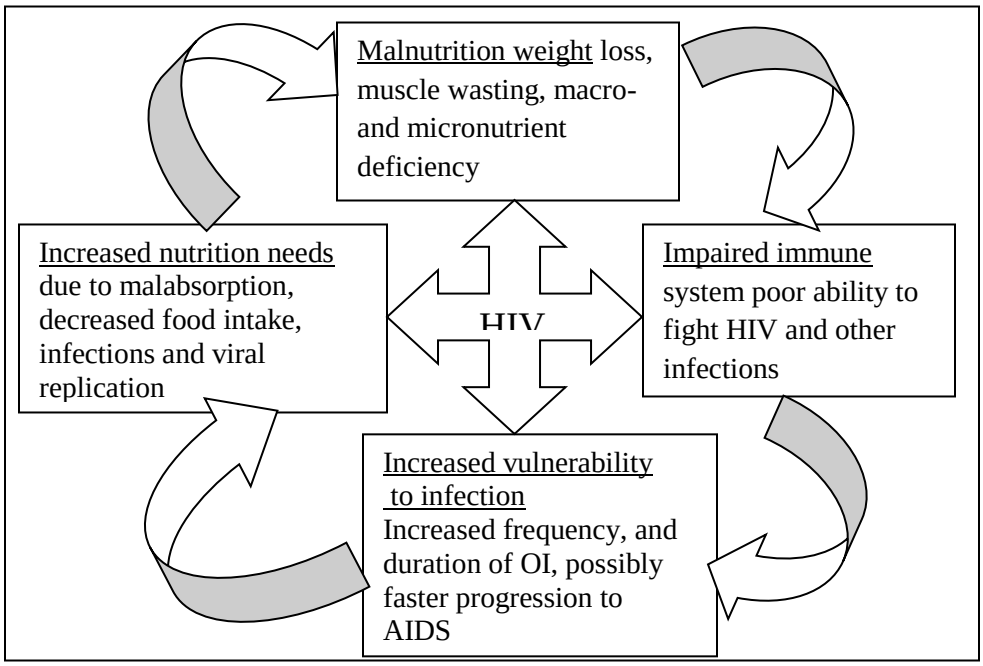


Figure 2. 1: - The vicious cycle of malnutrition and infection and HIV/AIDS Source: RCQHC and FANTA, 2003.

2.3. Socio demographic factors

A study conducted in Namibia concluded that the level of education of parent / care providers had an impact on children's nutritional status, meaning that illiteracy in caregivers is linked to an increase in child nutrition. This study also discussed about the presence of care providers among HIV positive children. Children who have lost their parents have poor alive quality life of and increase the risk of under nutrition. Those orphaned children may have poor social and economic support, whereas HIV / AIDS has an impact on the productivity of families, and these factors have indirectly affected children under 15 years of age. The nutritional status of children with HIV-positive was affected by parental family income. The family's low socio-economic status was susceptible to under-nutrition by making it difficult for them to meet basic needs. Income, food security and family size were risk factors for malnutrition among low Socioeconomic status family(25, 27). This study also shows, food insecurity and poverty are strongly associated with under nutrition. As research from India showed, majority of fathers (31.7 percent) and mothers (55.6 percent) of the study participants were illiterates. Majority of the fathers (38.3 percent) were farmers by occupation followed by drivers (17.8 percent) and laborers (19.4 percent). Half of the mothers (51.1%) were occupational housewives, followed by farmers (25.0%) and laborers (13.9%)(22).

According to study conducted in Adama Ethiopia, Socio demographic factors like age and sex of the host factor, were significantly associated with thinness according to multivariable logistic regression and BMI for age analysis of the study used, variables like Male Sex (AOR, 1.99; 95 percent CI: 1.19, 3.32) and Age greater than 10 years (AOR, 0.24; 95 percent CI: 0.08, 0.73) indicates significant association with thinness(1).

Stunting was more prevalent in males (37.3 percent) and in children above 12 years of age (48.4 percent), according to a study conducted in Italy. Similarly, in male children, wasting was higher and more than 5 times higher in adolescents (7.7 percent) than in younger children (1.4 percent)(28)

2.4. Feeding habits

Children with HIV/AIDS, often due to neurological deterioration related to HIV infection, can develop feeding problems, leading to insufficient nutrient intake(17). There may be poor sucking

in infants with HIV, resulting in insufficient consumption of breast milk or formula. Poor chewing and feeding abilities may be developed by older children. Swallowing difficulties can result in poor oral intake or refusal to eat. There is a risk of aspiration and pneumonia with swallowing problems(24).

Feeding practices and nutritional status were poor among HIV-positive children, even in food-rich areas, as studied in Tanzania. To improve it, tailored interventions should target children of poor households, the food insecure, and caregivers who have received only a low level of education(13).

The study in Tanzania also emphasized that well-nutritional status of less than 15 years of HIV / AIDS patients has an impact on the adherence of ART drugs, as a study conducted in Adama, eating problem was significantly associated with thinness. Under nutrition has risk of developing opportunistic infection (1)

2.5. Health related factors

2.5.1. Immune impairment

A retrovirus that affects the immune system and impairs the capacity of the body to combat infection is the human immunodeficiency virus (HIV). Some people with HIV for years do not show symptoms or become ill. The immune system gradually becomes weaker during the asymptomatic phase, and other viruses and bacteria can take advantage of the 'opportunity' offered by the weakened immune system to cause other diseases such as pneumonia or tuberculosis (TB) (29).

There is a dynamic connection between diet and HIV, according to research conducted in Namibia. A kid with HIV appears to have poor of the immune system. Cells of the immune system, such as CD4 cells, are reduced as the immune system weakens(25).

As the CD4 count down, opportunistic infections affect the child. Children with lower CD4 counts are also at risk of infection, thus raising the risk of being under-nourished. Good nutrition increases the immune function of the ART drug and its efficacy. It also helps to postpone HIV 's progression to AIDS (25). In order to categorize the immune status of HIV positive children, the

WHO immunological classification was used. CD4 counts > 500, 350-499, 200-349 and < 200 are considered normal, mild , moderate and sever respectively (22).

2.5.2. Opportunistic infection

The leading causes of morbidity and mortality in HIV infected patients are opportunistic infections. The nervous, gastrointestinal and respiratory systems and the skin are the main areas affected (30). The presence of such an infection is one indication of a compromised immune system. A person is said to have acquired immune deficiency syndrome (AIDS), which is the end-stage of HIV infection, once OIs are apparent(29).

2.6. Conceptual frame work of undernutrion

The conceptual frame work discussed below was adopted from researchers ,and adopted for being understood easily for readers and fit for my objectives.

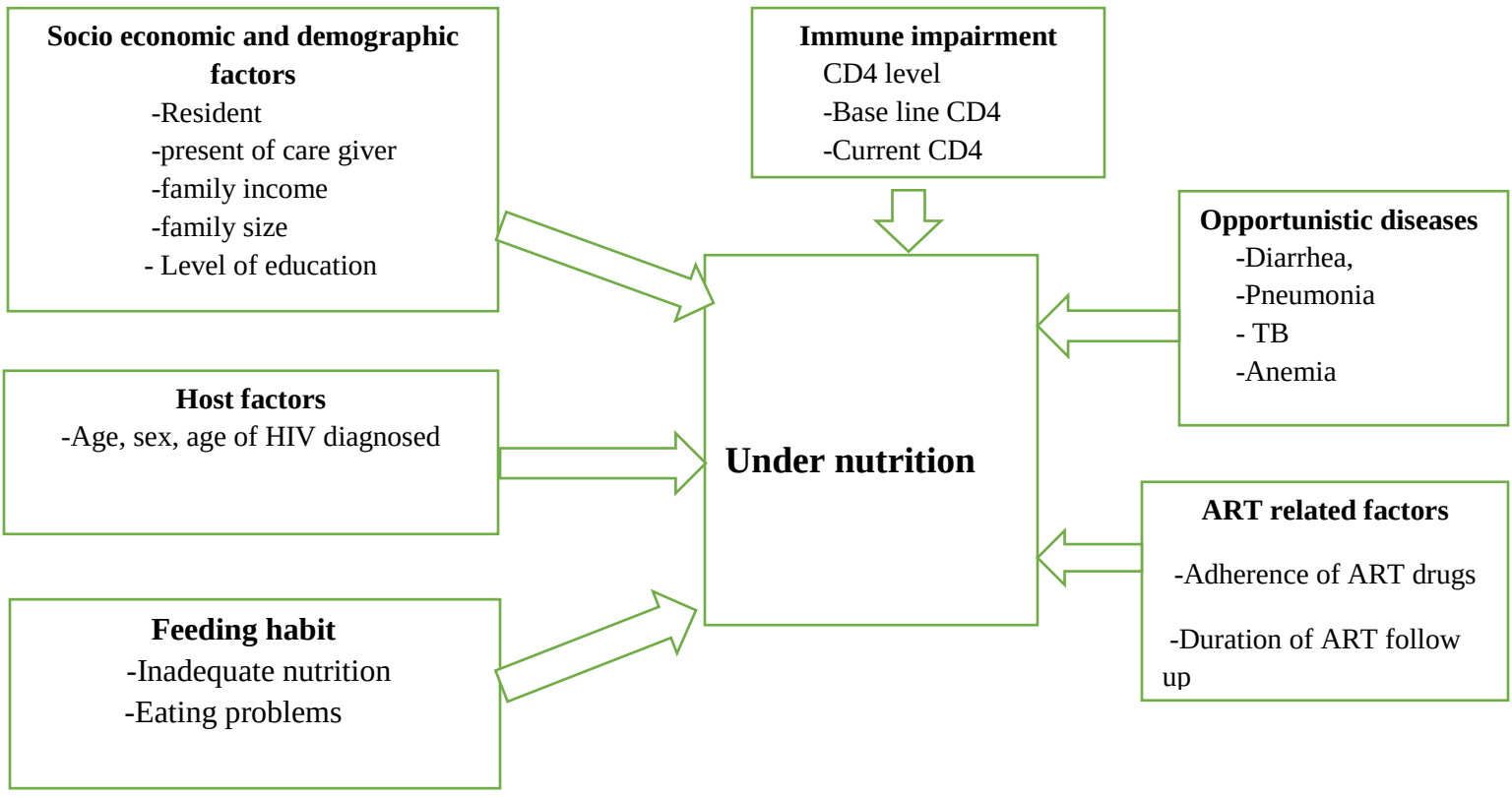


Figure 2. 2: conceptual from work adapted from researchers (Asiya, 2018 and USAID, 2001).

Chapter Three.

Research questions

1. What seams like under nutrition and associated factors among HIV positive children aged below 15 years?
2. What is the prevalence of undernutrition among HIV positive children aged below 15 years?
3. What are the factors associated with undernutrition among HIV positive children aged below 15 years?

3. Objectives

3.1. General objective

To assess undernutrition and associated factors among HIV positive children aged below 15 years who receive care in selected governmental Hospitals Addis Ababa, Ethiopia,2020.

3.2. Specific objective

- ✓ To determine the prevalence of undernutrition among HIV/AIDS patients aged below 15-years who receive care at Alert, Zewditu, and yekatit 12 Hospitals in Addis Ababa, Ethiopia, 2020.
- ✓ To identify factors associated with undernutrition among HIV/AIDS patients aged below 15-years who receive care at Alert, Zewditu, and yekatit 12 Hospitals Addis Ababa, Ethiopia,2020.

Chapter Four

4. Methods

4.1. Study Area

The Study was conducted in Addis Ababa. According to HIV AIDS data and information the projection of HIV for people whose age 0-14 in Addis Ababa, in 2019 was 1614 (Male=823, Female=791)(31). There are atotal of 13 Governmental hospitals in the city and eight of them have ART clinic for HIV patient below 15 years. The annual report of each hospital services were assessed, and the total number of HIV positive children who were getting the service at each hospital were 447(Alert), 400 (Zewiditu Memorial hospital), 360 (yekatit12 hospital),340 (Saint Paulos Millinium Medical College),233 (Black lion hospital),190 (Turinesh Bejing hospital),153 (Petros),and140 (police) hospitals, this collected from unual report.

4.2. Study design and period

Institutional based cross-sectional study was conducted among HIV positive children below15 years from February to March , 2020 G.C.

4.3. Population

4.3.1. Source population

The source population were individuals who were receiving ART services at Governmental Hospitals in Addis Abeba.

4.3.2. Study population

The study population were selected from the top three hospitals that provide ART service to relatively large number of under 15years children. Simple random sampling method was used to select the study population.

4.4. Inclusion and exclusion criteria

4.4.1. Inclusion criteria

Subject were included in the study if they were HIV positive and aged Under 15: if they were receiving ART drug: if they had follow up for the last one year at Alert, Zewditu, and yekatit 12 Hospital during data collection period.

4.4.2. Exclusion criteria

Subjects were excluded from the study if the child or the mother/care giver refused to participate in the study:if the child was with incomplete back ground information: and if he/she was critically ill.

4.5. Sample size determination

The sample size was calculated using single population proportion formula assuming 5% margin of error, 95% confidence interval alpha, 0.05. The prevalence of malnutrition among HIV positive children <15 years (wasting=21.8% and stunting=13.4%) was taken from similar study conduct in Adama Oromia region, Ethiopia(1). The final sample size was determined by considering 10% non-respondent rate.

$$n = \frac{(Z)^2 p\,(1-p)}{d^2}$$

Where n=estimated sample

Z=desired 95% confidence, Z=1.96

P=Magnitude of undernutrition among HIV positive children of age 0 to 14 years=21.8% (0.218)

D=margin of error (0.05)

For wasting

$$= \frac{(1.96)^2 \times 0.218(1-0.218)}{(0.05)^2}$$

=262 under 15 children with HIV positive. Adding 10% of non-respondent rate, the total sample size would be estimated to be 278.

Since the exact number of source population of respondent is less than 10,000, then correction formula of nf =ni / (1 + ni/N) where nf = final sample size ni = Sample size from the formula, and

N = Total number of all the source population. Therefore, (278/ 1 + 278/2263 = **248**

For stunting

$$= \frac{(1.96)^2 \times 0.134(1-0.134)}{(0.05)^2}$$

=196 under 15 children with HIV positive. Adding 10% of non-respondent rate, the total sample size estimated to be 278. Therefore, (196/ 1 + 196/2263 = 248) =**180.**

Finally, the largest number out of the two (wasting=248 and stunting=180), was determined to be **248.** 10 individuals refused to participate in the study, therefore;complete data were collected from 238 participants.

4.6. Sampling procedure

Number of subjects taken from each Hospital was directly proportional to the total number patients who received health service as depicted in the sampling chart below (figure 2). Purposive sampling method was used to select the study areas, where as systematic random sampling was used to select study subjects from the health registry of the respective hospitals

The sampling interval was determined using the following formula:

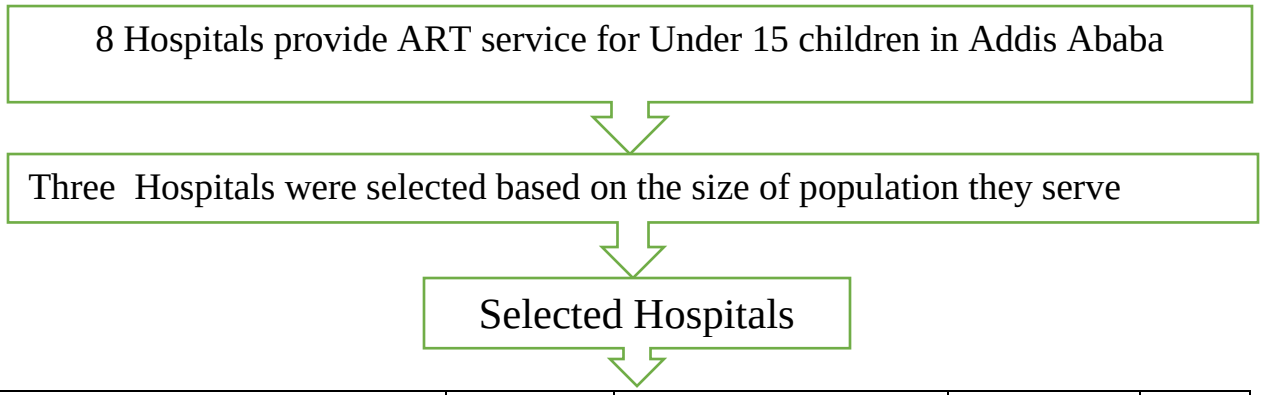
$$K = \frac{\text{total number of patients per month}}{\text{Minimum required sample size}}$$

Where k was the sampling interval

= 1207/248=5

1.1. Sampling chart

Figure 4. 1**. Schematic representation of the sampling procedure Addis Ababa, Ethiopia (n=248)**



Description	Alert Hospital	Zewditu Memorial Hospital	Yekatit12 Hospital	Total
Number of children who receive	447	400	360	**1207**
Sample size	92	82	74	**248**

4.7. Data collection tools and procedures

4.7.1 Sociodemographic and other characteristics

Three data collectors were included in data collection. One day training was given to them by the researcher, the owner of the researcher supervised the progress of data collection three times per week, and accordingly.The socio-demographic and other characteristic of the children were collected using structured questionnaire through direct interview . The questionnaire was prepared both in English and Amharic and it comprised enquiries related to sociodemographic characteristics, feeding habit, presence of opportunistic disease and adherence to ART programe.

4.7.2 CD4 and viral load level

The CD4 count and the Viral load level were obtained by reviewing medical record of the children.

4.7.3 Antropometric measurments

Measurements of weight, height, and MUAC were done following the standard procedures. All children below 15 were weighed and measured while they were wearing light cloths, no shoe and diaper. WHO standard clinical weighing scale & erect height measuring electrical device (DHM-15b) were used for measuring height and weight respectively. The weight and height scale were caliberated to the position of zero. The measurement was taken two times for each children. The final measurement was recorded. Those aged below 2 years were measured by infant weight scale on horizontal position placing the infant on the center of platform. Two persons involved to measure the infants weight and length. One person held the head of infant while the other person kept the infant's knees straight and brought the adjustable footplate up to the infant's heels.

Children above 2 years were weighed on standing position with no assistant and their height was measured using stadio meter while the child was standing straight with the head in the Frankfurt plane, feet together, knees straight, and heels, buttocks, and shoulder blades in contact with the vertical surface of the stadiometer.

For children aged <=5yrs MUAC was taken while the children were sited on perpendicular position either on her/his mothers'knee or chair with gently bended the left arm through 90^0 at the elbow. Located the tip of the olecranon process of the ulna, marked the midpoint with a soft pen, relaxed the arm so that the elbow was extended and hanged just away from the side of the

trunk, with the palm facing the thigh. Then wrapped the tape gently but firmly around the arm at the midpoint /arm was not squeezed. Finally, measurements were taken to the nearest 0.01mm.

4.8. Study Variables

4.8.1. Dependent Variable

The dependent variable of the study was undernutrition.

4.8.2. Independent Variables

The independent variables were age, sex, resident, care givers, family size, and family income, level of education, feeding habit, CD4 count, opportunistic infection, duration of ART and adherence to ART drugs. These independent variables were adopted from previous studies (1, 14, 22).

4.9. Data Quality Management

4.9.1. Validity and Reliability

Validity determines the degree to which an instrument able to measure what is intended to, for this reason WHO standard clinical weighing scale & erect height measuring tape was used and the machine was checked for consistency after every twenty measurements.Whereas reliability indicates to consistency or repeatability of measure. Pretest on 5% of the total sample was done in order to check the flow of questionnaires' and ambiguity. The questioner was restructured based on the finding.

4.10. Data Analysis

Multivariate analysis was done to control confounders. Data entry was done using SPSS version 23. Non-numerical data were coded in to numerical. The questionnaires were checked for its completeness every day by the researcher. Univariate and multivariate analysis were done to assess factor associated with undernutrition. WHO ANTHRO was used to assess the nutritional status of the children.

4.11. **Operational Definition**

- ✓ **Under nutrition**-wasting when Weight for-Height Z score (WHZ) or BMI-for-Age Z-score (BAZ) <-2 SD, stunting when Height-for-Age Z-score (HAZ) < -2 SD, and underweight when Weight-for-Age Z-score (WAZ) < -2 SD.
- ✓ **Under 15-Those age 0-14years**. Preschool (<5 years), school age (5-10 years), Adolescents (>10 years).
- ✓ **Normal CD4** -CD4+ count >500.
- ✓ **Abnormal CD4**- Those with CD4+ count 350-499, 200-349, <200 or <15% were categorized to have mild, moderate and severe immunodeficiency respectively.
- ✓ **Viral load detected** is when viral load test is >1000 cubic mm^3
- ✓ **Good adherence** -is defined as a patient's ability to follow a treatment plan, take medications at instruction times and number of time to take per day, and follow restrictions regarding food and other medications.
- ✓ **Eating always:**The child eats his break fast,lunch,and dinner every day.
- ✓ **Eating sometimes:** The child feeds his break fast,lunch,and dinner two days per week.
- ✓ **Critically ill:** those child who were un able to stand on weight scale (measurments) in the case of severe illness.
- ✓ **Illiterate:** families/care givers who can not read and write.

4.12. Ethical consideration

Ethical clearance for the study was acquired from Addis Ababa University and Addis Ababa public Health Research and Emergency Management Directorate.The purpose of the study was explained to the participant and written informed consent obtained from each of them.

4.13. Dissemination of the result

The final report of this study will be submitted to Addis Ababa University, College of Natural and Computational Science. It will also be sent to Federal Ministry of Health and Addis Ababa Health Bureau.

4.14. Expected outcome

- ✓ The magnitude of undernutrition and associated factors of aged below 15 years children with HIV/AIDS will be determined.
- ✓ It will provide an input for researchers, health institutions, and policy makers in their future move.

Chapter Five result

5.1. descriptive statistics

5.1.1 Socio demographic characteristics

The average age of the children was 10.73+ 3.65.Almost equal proportion of males 117(49.2%) and females 121(50.8%) children participated in the study,and majority of them stayed with virus 5-10years (Table1). Close to100% of the children were urban resident(98.3%).Less than half of the children have lost either their mother or father(38.2%) but $^{3}/_{4}$ of children live with their parents. On the other hand,only 43% of children receive care from both parents. Only slightly higher than a quarter of the subjects had monthly income >3000. Also, nearly half of the parents were illiterate(42.6%) where as 90% of children were primary school students.

Table 5. 1. Socio demographic characteristics of children aged less than 15 living with HIV/AIDS in governmental hospitals Addis Ababa Ethiopia, 2019/2020 E.C

Variables		Frequency	Percentage
Age (years)	<5	30	12.6
	5-10	51	21.4
	10-14	157	66.0
Sex	Male	117	49.2
	Female	121	50.8
Duration with HIV/ AIDS	<5years	79	33.2
	5-10years	100	42.0
	>10years	59	24.8
Residence	Rural	4	1.7
	Urban	234	98.3
Living status of parents	Both alive	114	47.9
	Mother died	45	18.9
	Father died	46	19.3
	Both died	20	8.4
	Separated/divorced	13	5.5
children live with	parent	180	75.6
	sister/brother	11	4.6
	aunt/uncle	23	9.7
	grand parent	10	4.2

	other	14	5.9
Care giver of child	Both parents	102	42.9
	Mother	61	25.6
	Father	22	9.2
	Sister	25	10.5
	Brother	23	9.7
	Religious father	5	2.1
Monthly income	<1500	74	31.1
	1501-3000	96	40.3
	>3000	68	28.6
Mother Education	illiterate	65	27.3
	primary	80	33.6
	secondary	71	29.8
	collage and above	22	9.2
Father Education	illiterate	45	18.9
	primary	60	25.2
	secondary	83	34.9
	collage and above	50	21.0
Child education	secondary	4	1.7
	primary	214	89.9
	drop out	2	.8
	not enrolled	18	7.6

5.2. Feeding habit

More than 80% of the children consume 3 times aday,but half of them were not having any snack. More than half of the participants did not receive 140(58.8%) nutrition training and the majority were not counseled for diet140(58.8%). Almost, all children aged 0-2 were using replacement feeding. Among the eligible only 30% of them were receiving nutritional therapy and close to half of them reported to have eating problems (42.9%) such as loss of appetite,difficult to swallow,nausea/vomiting. Exclusive (2.9%), and continuous (2.5%) breastfeeding practices and timely introduction of complementary foods were very low (2.1%).

Table 5. 2 Feeding habit of Children on ART at Governmental hospital whose age less than 15 years Addis Ababa Ethiopia,2019/2020

Variable		Frequency	Percent
Breakfast	Always	195	81.9
	Sometimes	43	18.1
Lunch	Always	204	85.7
	Sometimes	34	14.3
Dinner	Always	210	88.2
	Sometimes	28	11.8
Snack	No	120	50.4
	Yes	118	49.6
Child nutritional counseling	No	140	58.8
	Yes	98	41.2
Currently on nutritional therapy	No	167	70.2
	Yes	71	29.8
Nutritional therapy	Vitamin supplement	3	4.2
	plaplate	37	52.1
	therapeutic milk	10	14.1
	other	21	29.5
Child eating problem	No	136	57.1
	Yes	102	42.9
Types of eating problems	loss of appetite	71	69.6
	Dificult to swallow	6	5.9
	nausea/vomiting	21	20.6
	bulimia	3	2.9
	other	1	0.9
Age 0-2 years			
Feeding situation of 0-2 years	Replacement feeding	13	5.5
	Not illegible	225	94.5
Duration breast feeding	<=6months	7	2.9
	6months-1year	6	2.5
	not illegible	225	94.5
Introduction of complementary food	before six months	1	0.4
	at six months	5	2.1
	after six months	7	2.9
	not illegible	225	94.5

Not illegible: of coures age can matter, but that was done for reducing recall bias. Families/care givers of children aged above 2 years not remind accurately when they started CF.

5.3. CD4,Viral load and adherence to ART drug and programe

According to the review of follow up card, majority of the participants 198(83.2%) had intial CD4 count record and (47.5% of them) had normal CD4 result. Viral load test was done for 170 (71.45%) children for the last one year, out of this (42.9%) of the children's viral load was not detected.More than 80% of the participant had good adherence to ART andART programme.And the weight of most of the participants 158(66.4%) increased after ART drug initiation.

Table 5. 3:- Factor related with HIV infection of study participant children less than 15 years old living with HIV/AIDS in governmental hospitals Addis Ababa Ethiopia, 2019/2020 E.C

Variables		Frequency	Percent
CD 4 initial	No	40	16.8
	Yes	198	83.2
Base line CD 4 result	severe immune deficiency	67	33.8
	Moderate	17	8.6
	Mild	20	10.1
	Normal	94	47.5
CD4 recent	No	119	50.0
	Yes	119	50.0
Recent CD4 result	severe immunodeficiency	2	1.7
	moderate	5	4.2
	mild	18	15.1
	normal	94	78.9
Viral load test	No	68	28.6
	Yes	170	71.4
Viral load result	undetected	102	42.9
	detected	68	28.6
Adherence ART	good	214	89.9
	fair	23	9.7
	poor	1	.4
Adherence program	good	200	84.0
	fair	37	15.5
	poor	1	.4
Stay with out ART	no	144	60.5
	yes	94	39.5
Duration with ART	<5years	77	32.4
	>5years	18	7.6
	Saty with ART from the begning	143	60.1
Weight after ART	increased	158	66.4
	decreased	35	14.7
	not changed	38	16.0
	i dont know	7	2.9

5.4. Oportunistic infections

Less than half of the children _84(35.3%) had opportunistic infections such as skin infection28 (33.3%), TB (19.0%) pneumonia(15.5%), diarrhea(10.7%), and other infections (21.4%).

Table 5. 4:- Oportunstic infections of study participant children less than 15 years old living with HIV/AIDS in governmental hospitals Addis Ababa Ethiopia, 2019/2020 E.C

Opportunistic infection	No	154	64.7
	Yes	84	35.3
Types of opportunistic infection	diarrhea	9	10.7
	TB	16	19.0
	pneumonia	13	15.5
	skin infection	28	33.3
	Other	18	21.4

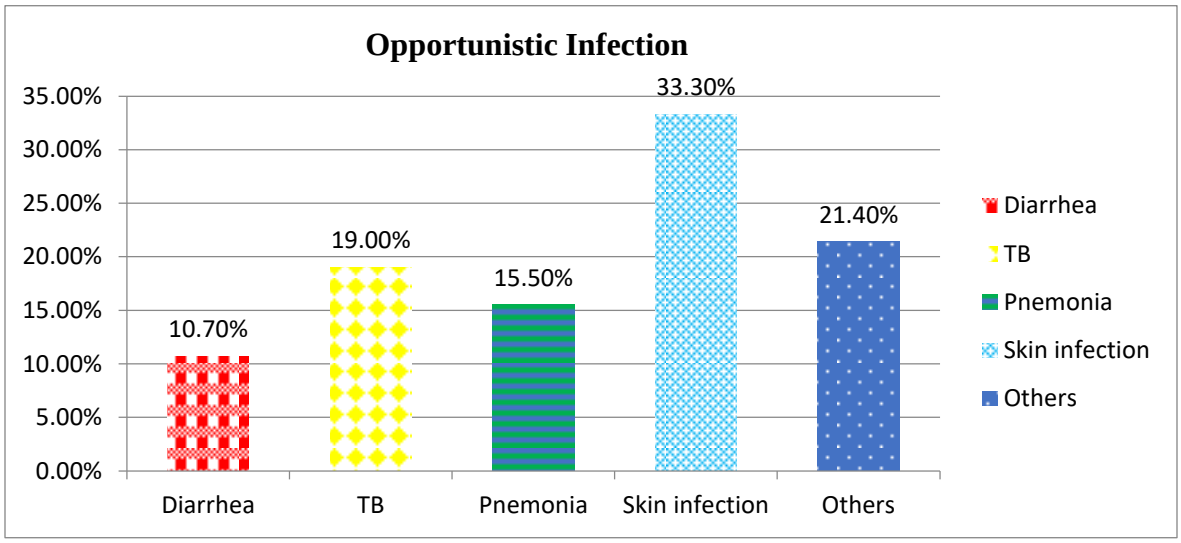


Figure 5: Prevalence of OPI among HIV infected children 0-14 years old in selected governmental hospital Addis Ababa Ethiopia (n=238)

5.5. prevalence of under nutrition

Close to 30% of the children were stunted. The highest level of stunting 62-(91.2%) was observed among male 39-(57.4%) and children aged 10-14 years. Slightly higher than one fourth of the children 63 (26.50%) ware wasted. Similar to stunting, the higher proportion of wasting was observed among male 44 (70.0%) and those aged 10-14.

Among children less than five years the proportion of SAM, MAM, and normal respectively were 2(8.7%), 6(26.10%) and 15 (65.20%).

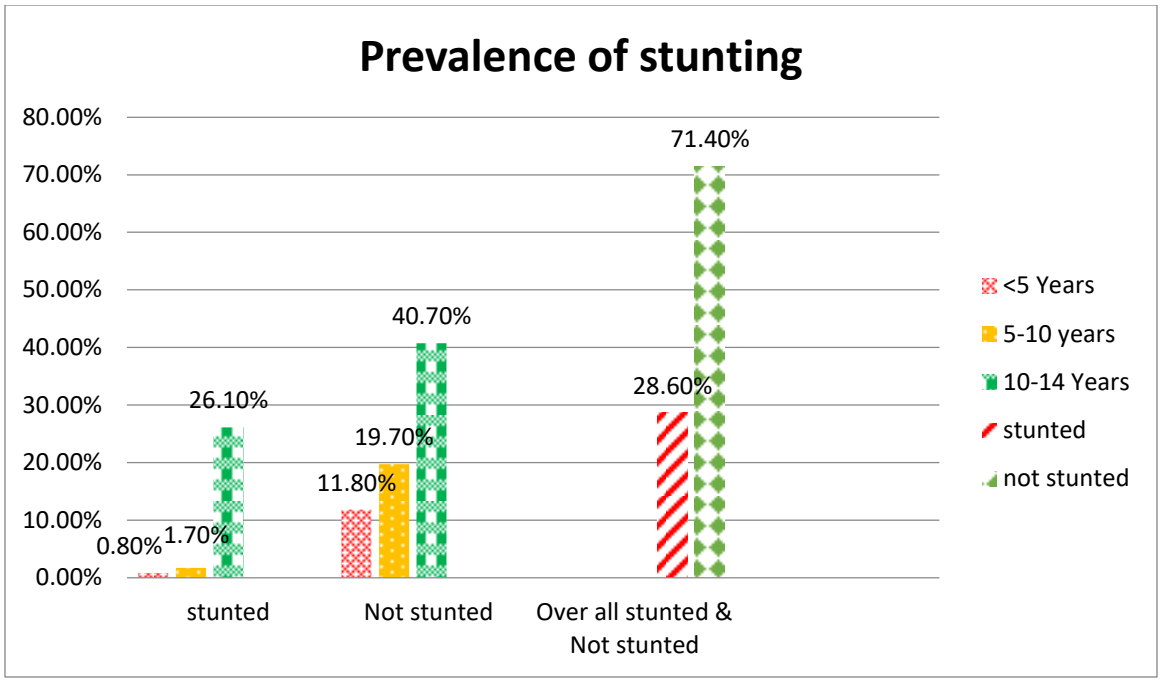


Figure 5.1 Prevalence of stunting among HIV infected children 0-14 years old in selected governmental hospital Addis Ababa Ethiopia (n=238)

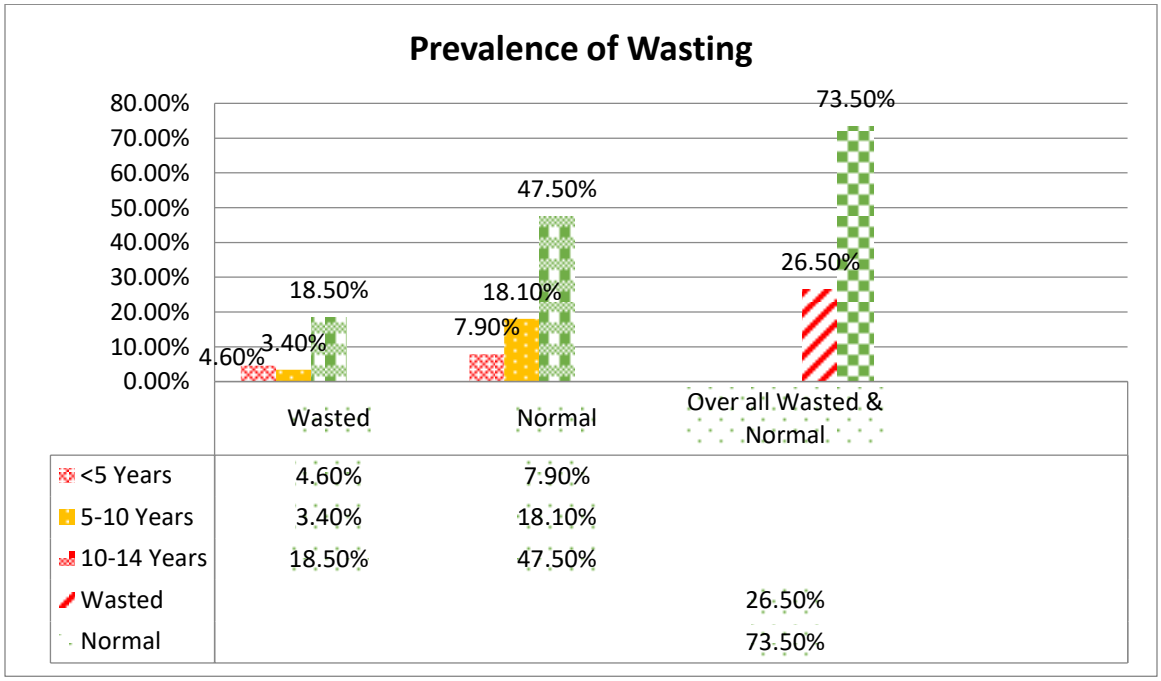


Figure 5. 2:-Prevalence of wastin among HIV infected children 0-14years old in selected governmental hospital Addis Ababa Ethiopia (n=238).

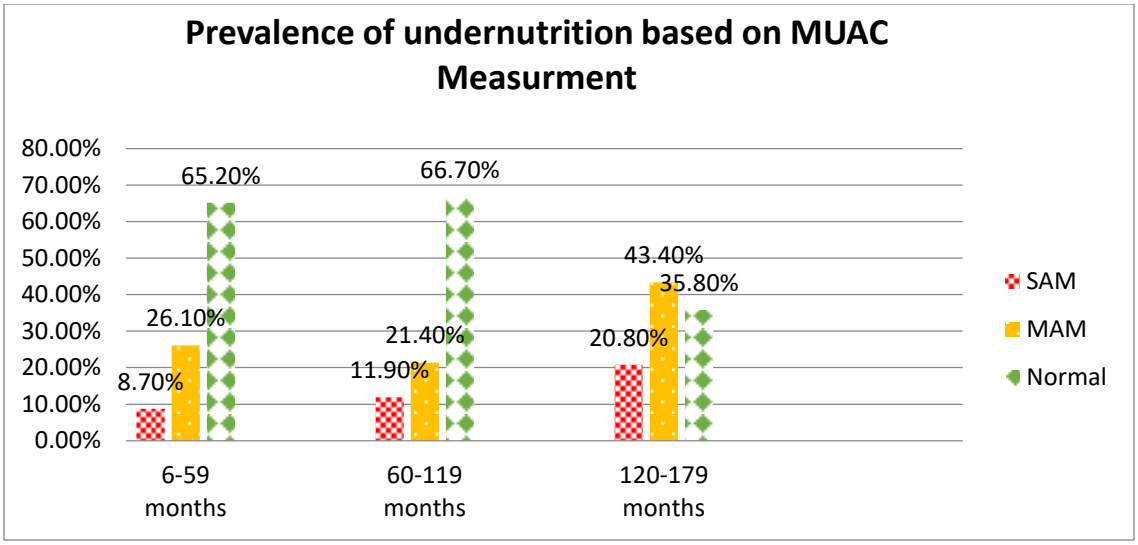


Figure 5. 3:-Prevalence of SAM and MAM with MUAC measurement among HIV infected children less than 5 years old in selected governmental hospital Addis Ababa Ethiopia (n=238).

5.2. Factor associated with undernutrition

Variables sex, duration with HIV, family income, consumption of snack and nutrition counseling showed significant association with stunting in the bivarate regration analysis. After controlling for confounders in the final model, duration with HIV, family income and consumption of snack remained significant (P<0.05). Children who stayed with HIV for 5-10 years were 2.26 times more likely to be stunted as compared to children who stayed with virus for more than 10 years [AOR=2.26, 95% CI: 1.14-4.76]. Also, those families whose income was <1500 were 2.4 times more likely to be stunted as compared to those whose income was >3000 Birr [AOR=0.41,95CI:0.88-0.91]. In addition, children who do not eat their snack were 2.11 times more likely to be stunted as compared to those children who do not eat their snack [AOR= 2.11, 95% CI: 1.15-3.86]. Furthermore, children who do not get nutritional counseling had 32% increased risk of stunting as compared to children who get nutritional counseling [AOR=1.32, 95%CI: 0.72-2.42].

Table 5:Factor associated with malnutrition among HIV positive children aged 0-14 years selected government hospital as measured by HFA.

Variables	Stunting		COR95%CI	AOR 95%CI	P-value
	Yes	NO			
Sex					
Male	39	78	1	0.61(0.32-1.10)	0.11
Female	29	92	1.58(0.89,2.79)	1	-
Duration with Virus					
<5 yrs	24	55	1.36(0.668,2.780)	1.49(0.71-3.14)	0.395
5-10yrs	22	78	2.11(1.04,4.28)	**2.26(1.14-4.76)**	**0.039**
>10yrs	22	37	1	1	-
Familly Income					
<1500	27	47	0.45(0.21,0.96)	**0.41(0.88-0.91)**	**0.039**
1501-3000	27	69	0.66(0.32,1.39)	0.62(0.29-1.33)	0.274
>3000	14	54	1	1	-
Ate Snack					
No	26	94	1.99(1.12,3.55)	**2.11(1.15-3.86)**	**0.018**
Yes	42	76	1	1	-
received nutrition counseling					
No	35	105	1.52(0.86,2.69)	1.32(0.71-2.41)	0.146
Yes	33	65	1	1	-

Significant at p-Value less than 0.05

Regarding to **BMI for age analysis,** variables like child education, oportunstic infection, frequency of dinner, and child eating problems showed significant association with wasting in the bivariate logistic regration. After controlling for the confounders in the final model of multivariate regration,_frequency of dinner,_child eating problems were the variables that were significantly associated with Wasting with (P_<0.05).

Those children who were taking their dinner sometimes 2.6 times morelikely to have wasting as compared to children who were taking it always. [AOR=0.39,95%CI:0.17-0.92]. Also children who had no eating problem had 48% decreased risk of wasting as compared to children having no eating problem[AOR= 0.52, 95%CI: 0.28-0.98].

Table 6:Factor associated with malnutrition among HIV positive children aged 0-14 years that receive ART service at selected government hospitals as measured by Body Mas Index for Age(BFA).

Variables	Wasting		COR95%CI	AOR95%CI	P-Value
	Yes	NO			
Child education					
Secondary	3	1	1	1	-
Primary	63	151	3.00(0.26,34.58)	0.79(0.72-8.85)	0.125
Drop out	2	0	3.12(1.18,8.26)	0.21(0.05-8.390)	0.378
Not enrolled	0	18	1.00(0.05,18.57	0.33(0.02-4.42)	0.022
Child OPI					
No	43	25	1	1	-
Yes	111	59	0.59(0.33,1.06)	0.73(0.39-1.36)	0.078
Frequency of dinner					
Always	59	151	1	1	-
Sometimes	9	19	0.36(0.16,0.81)	**0.39(0.17-0.92)**	**0.013**
Child eating problem					
No	35	101	1	1	-
Yes	33	69	2.408(1.338,4.335)	**0.52(0.28-0.98)**	**0.003**

Significant at p-Value less than 0.05

Key findings of this study

- This cross sectional analysis aimed to determine Undernutrition and associated factors among HIV positive children aged below 15 in selected governmental hospitals. The study found that the prevalence of undernutrition among HIV positive children aged <15 were 28.6%(stunted) , 26.5%(wasted)
- Concerning factors related to undernutrition;duration child live with HIV,Family income, and snack consumption were identified factor affecting stunting.
- On the other hand, Frequency of dinner and the presence of eating problem were identified factor affecting wasting.

6. Discussion

The study assessed the nutritional status and the various factors associated with undernutrition among HIV positive children aged below 15 years. The children were receiving ART services in three governmental Hospitals in Addis Ababa. The prevalence of stunting and wasting was alarming among the children. The reason for the problem could be the reported low meal frequency, the inadequate access to nutrition counseling, and the eating problems reported by significant number of participants (> 40%). The low meal frequency in combination with suppressed appetite, because of viral replication, is likely to contribute to the problem(32). Also, the low access to nutrition counseling probably worsened the nutrition outcome among the subjects(33).

Even though significant number of children were undernourished it is unfortunate that the National Food and Nutrition policy of Ethiopia remains silent on the matter regarding the nutritional care of PLHIV. But, the level of stunting in the present study was lower compared to previous studies done in El Salvador, 33.2% (12), Kolkata, 55%, (14), and Southern India, 58% (22). One reason for this probably be the variation in the timing of the studies in which stunting has been reduced in the last 10 years globally. However, the prevalence was higher than the report from Adama, 13.4 (1). Some of the reasons for the difference in the magnitude of the problem could be the dissimilarity in participant age, socioeconomic status, access to health care services, difference in study method, and it could be because of the disparity in the background rate of HIV infection and malnutrition in the area.

The prevalence of wasting was higher compare to a study done in Adama, 21.8% (1), El Salvador, 3.3% (14) and Southern India 16% (22), which could possibly because of the reasons mentioned just above for the variation in the magnitude of stunting. But, the magnitude of undernutrition was lower than the WHO estimates among under five children regardless of HIV status for the African region in 2019 (34). This is surprising since under-nutrition is expected to be prevalent in HIV infected children than uninfected (35). However, unlike the present study the global report is for under 5 children.

Those who stayed with HIV for 5-10 years were twice more likely to be stunted compare to those children who lived with the virus for more than 10 years. Previous study done in Adama

also reported the same association (1).The possible reason for this could be caregivers of those children who stayed longer with the virus might know how to take care of themselves through getting more number of nutrition counseling with time. Also, similar to a report from Adama (1), those children with lower family income were liable to stunting. The reason for this could be families with low socioeconomic status cannot afford to feed their children properly. Compared to having snack, having no snack was a risk factor for stunting among the children. But, previous study from Adama indicated no association between having no snack and stunting (1). The discrepancy in the result indicates the difference in the factors associated with stunting, with variation in geographical location. This indicates the need to do similar studies in different areas.

On the other hand, Frequency of dinner and child eating problem were significantly associated with wasting. Those children who always consumed dinner had 61% decreased risk of wasting as compared to those children who were consuming dinner sometimes. Those children who had eating problem and those who had no eating problem were having almost equal risk to stunting. But, previous report from Gondar indicated 2.14 times higher odds of being wasted among children with eating problems compared to those children who had no eating problem (14). One reason for the difference might be the disparity in the type of eating problem reported.

7. Limitation of the study

This study has its own limitation that should be taken in account while doing generalizability. Due to the nature of cross sectional study we can't conclude cause and effect from the finding. So this study lacks identifying the cause of under nutrition. In addition, the study was not also triangulated with qualitative study. I also, faced a selection bias in this study and controlled by used systematic ways of selecting the study subjects.

8. conclusion

In this study high prevalence of wasting and low prevalence of stunting were reported as compare to other study. Family income <1500, duration of child live with HIV5-10years and children Snack eat were important predictor of stunting. Frequency of dinner and eating problem were important predictor of wasting.

9. Recommendation

Health facilities

- ✓ Nutrition counciling should be accessable to PLHIV
- ✓ The health facilities leader should assess health care providers for their performance on the existing guide line.

For policy maker

- ✓ Considering the high prevalence of undernutrition among PLHIV they should be addressed in the food and nutrition policy of the country.

For researchers

- Longitudinal studies that combine qualitative and quantitative methods are needed on the topic
- The dietary quality of PLHIV should be assessed well.
- Further studies are needed in different geographical locations.

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ANNEXES

ANNEX 1 -Information sheet

Information sheet and informed voluntary consent form for caregivers of under-fifteen children with HIV/AIDS.

My name is_____, I am working as data collector for the study being conducted in Governmental Hospitals at Addis Ababa by Teklu Assefa who is studying for his Master's Degree at Addis Ababa University College of Natural and computational Science. I kindly request you to lend me attention to explain you about the study and your Hospital being selected as the study setting.

Title of the study: Undernutrtion and associated factor among HIV positive children aged less than 15 years old in selected Governmental hospitals in Addis Ababa Ethiopia, 2019/2020. Institutional based cross sectional study.

Purpose: The purpose of this study is to write thesis as a partial requirement for the fulfillment of Master's Degree in Community Nutrition for the principal investigator. Eventually, the study results on Nutritional Status of HIV positive children less than 15 years old and associated factors in selected Governmental hospitals in Addis Ababa Ethiopia will contribute to the improvement of nutritional status of those HIV positive children's less than 15 years old.

Procedure and duration: I will interview caregivers of under-fifteen children by using questionnaire to provide pertinent data that is helpful for the study, take anthropometrics measurements (Weight, Height and Middle upper arm circumference) and document review of children. There are 37 questions to answer where I will fill the questionnaire by interviewing caregivers, taking anthropometrics measurement and document review of children's. The procedure will take about 30 minutes.

Risk and benefits: the risk of participating in this study is minimal, but only taking few minutes from caregivers time. There would be no direct payment for participating in this study. But the findings from this research may reveal important information on nutritional status and associated factors of HIV positive children in your Hospitals and for development of Nutritional program based on the finding of this study.

Confidentiality and Anonymity: The information you will provide us will be confidential. There will be no information that will identify you in particular. The findings of the study will be

general for the study area and will not reflect anything particular of you or your housing. The questionnaire will be coded to exclude showing names. No reference will be made in oral or written reports that could link you to the research.

Rights: participation for this study is fully voluntary basis. You have the right to declare to participate or not in this study. If you decide to participate, you have the right to withdraw from the study at any time and this will not label you for any loss of benefits which you otherwise are entitled. You do not have to answer any question that you do not want to answer.

Persons to contact: If there are any questions about the study, you can contact with any of the following addresses.

Teklu Assefa: mobile number +251 913972144

E-mail: assefateklu1221@gmail.com

ANNEX 2: Declaration of informed voluntary consent

I have read/was read to me the participant information sheet. I have clearly understood the purpose of the research, procedures, the risks and benefits, issue of confidentiality, the right of participating and contact address for any queries. I have been given opportunity to ask questions for things that are unclear. I was informed that I have rights to terminate the study at any time. Therefore I declare my voluntary consent to participate in this study with my signature.

Participant: Name _____ Signature_____

Data collector: Name _____ Signature_____

N.B: This is to be signed face to face in the presence of the data collector. Please provide a copy of this signed consent to the participant.

Thank you for your cooperation!

ANNEX 3:Assent Form (for children)

My name is----------I am at Addis Ababa university college of natural and computitional scince. I am inviting you to participate in aresearch study about Undernutrition and associated factor among HIV positive children aged less than 15 years. Your parent(s) know we are talking with you about the study. This form will tell you about the study to help you decide whether or not you want to take part in it.

Procedure:-If you decide to be in the study, I will measure your weight, heghit and middle upper arm circumference.The procedure will take about **5** minute.

Benefit:- The findings from this research may reveal important information on nutritional status and associated factors of HIV positive children attending Hospitals and for development of Nutritional program based on the finding of this study. Over all this study will contribute to the improvement of nutritional status of those HIV positive children's less than 15 years old.

Risk:-The risk of participating in this study is minimal, but only taking few minutes to measure your weight , heghit and middile upper arm circumferences.

Confidentiality:- If you decide to be in the study I will not tell any one else. Your name will not register.

Right:- You have the right to declare to participate or not in this study. No one will get angry or upset if you don't want to do this. And you can change your mind anytime if you decide you don't want to be in the study anymore.

Persons to contact:- If you have questions about the study, you can ask me now or anytime during the study. You can also call me at +251 913972144 or

email me at **assefateklu1221@gmail.com**

Signing below means that you have read this form and that you are willing to be in this study:

Signature of the Participant----------

Date----------

Name of data collector----------signiture----------Date----------

Thank you for your cooperation!

ANNEX 4: Questionnaires

1. Question Related to Socio demographic characteristics of HIV positive children at governmental Hospital in Addis Ababa.		
Number	**Questions**	**Responses**
101	Sex of your child	1. Male 2. Female
102	Age of your child	----------
103	How long have been your child live with HIV/AIDS?	----------
104	Residence	1. Rural 2. Urban
105	Parent or care giver living status	1. Both alive 2. Mother died 3. Father died 4. Both died 5. separated /divorced
106	Currently, with whom children are Living?	1. parents 2. sister/Brother 3. Aunt/ unkle 4. Grandparents 5. other
107	who is/are care giver?	1. Both parents 2. Mother 3. Father 4. Sibling 5. religious father 6. other
108	Monthly family income	1. <1500 2. 1501-3000 3. >3000

109	Education (mother)	1. Illiterate 2. Primary 3. Secondary 4. college and above
110	Education (father)	1. Illiterate 2. Primary 3. Secondary 4. college and above
111	Education(child)	1. Preparatory 2. Secondary 3. Primary 4. Drop out 5. Not enrolled
2. Questions related to CD4 count/document review/		
112	Was CD4 done for the child, initially?	0. No 1. yes
113	If yes for question No.112 ,What was the Base line CD4 count?	
114	Is CD4 done now(recent)?	0. No 1. yes
115	If yes for question No.114 , what was the recent CD4 count?	
116	Does the child had viral load test for the last one year	0. No 1. yes
117	If yes for Q.NO116 What was the viral load result?	
3. Questions related to opportunistic infection		
118	Does the child have opportunistic infection?	0. no 1. yes
119	If, Yes for Q118 what types of opportunistic infection does the child suffer from?	**1.** diarrhea **2.** TB

		3. pneumonia **4.** skin infection **5.** Other specify ……..
4. Questions related to Adherence to ART drug		
120	How does the child Adherence for ART drug?	1. Good 2. Fair 3. Poor
121	How does the child Adherence for ART programmer?	1. Good 2. Fair 3. Poor
122	Did your child stay without taking ART Drug?	0. no 1. yes
123	If yes for Q No.122 ,for how long?	
124	How did you get your child weight after he start ART drug?	1. Increased 2. Decreased 3. Not changed 4. I don't know
5. Questions related to feeding habit		
125	Frequency of breakfast?	1. sometimes 2. always
126	Frequency of lunch?	1. sometimes 2. always
127	Frequency of dinner	1. sometimes 2. always
128	Does the child eat snack?	0. no 1. yes
129	Feeding situation of Under six months	1. exclusive breast milk 2. Replacement feeding 3. Mixed feeding

130	Duration of breast feeding	----------
131	Did you start complementary feeding timely?	0. No 1. yes
132	Age of complementary feeding start	1-Before six months 2-At six months 3-After six months 4-Not start yet 5-I don't know
133	Is your child get Nutritional counseling?	0. no 1. yes
134	Is your child currently on nutritional therapy?	0 no 1 yes
135	If our answer were yes for Q134, what kind of nutritional therapy does your child is receiving ?	1.Vitamin 'A' Supplement 2.Plaplate 3.Therapeutic milk 4. Other specify……
136	Does the child have eating problems?	2. no 3. yes
137	If your answer were yes for Q136 what type of eating problem does the child have?	1. Loss appetite 2. Difficult swelling 3. Nausea/Vomiting 4. Bulimia 5. Others specify

Source of questionnaires:

- **Adopted from researchers (Asiya Jeylan etal,2018 & Raghavendra N., R. G. Viveki, 2019).**

ANNEX 5: Anthropometric measurements

Height of Under 15 yrs. old patient with HIV/AIDS	……cm
Weight of Under 15 yrs. old patient with HIV/AIDS	…….kg
MUAC of more than 6 months and Under 15 yrs. old patient with HIV/AIDS	…….cm

አባሪዎች

<u>አባሪ 1፡- እድሜአቸው ከአስራ አምስት ዓመት በታች የሆኑ እና ከኤች አይ ቪ ኤድስ ጋር ከሚኖሩ ልጆች ቤተሰቦች ወይም ተንከባካቢዎች ጋር በእወቀት ላይ የተመሰረተ የበጎ ፍቃድ ስምምነት ማድረጊያ ፎርም</u>

ስሜ ----------ይባላል፡፡ በአዲስ አበባ ዩኒቨርስቲ በተፈጥሮ ሳይንስ እና ቀመር ትምህርት ክፍል የሁለተኛ ድግሪ ማሙያ ጥናት በአዲሰ አበባ ከተማ ውስጥ ባሉ የመንግስት ሆስፒታሎች ላይ መረጃ በመሰብሰብ ላይ እገኛለሁ፡፡ ስለሆነም ከዚህ በመቀጠል የጥናቱ አላማ እና እርሶ የሚሰሩበት ሆስፒታል ለምን እንደተመረጠ እንዳስረዳ በትህትና እጠይቃለሁ፡፡

የጥናቱ ርዕስ፡- በደማቸው ውሰጥ የኤች አይ ቪ ኤድስ ያለባቸው ከ15 አመት በታች የሆኑ ልጆች የስነምግብ ሁኔታ እና ተዛማጅ ችግሮቻቸው በአዲስ አበባ ከተማ አሰተዳደር በሚገኙ የተመረጡ የመንግስት ሆስፒታሎች፤ተቋማዊ መሰረት ያደረገ ከፊል ገፀታ ጥናት በ 2019/2020.

የጥናቱ አላማ፡- የዚህ ጥናት አላማ በማህበረሰብ ስነምግብ ትምህርት ለሁለተኛ ድግሪ ማሟያ እንዲሆን ታስቦ በደማቸው ውሰጥ የኤች አይ ቪ ኤድስ ያለባቸው ከ15 አመት በታች የሆኑ ልጆች የስነምግብ ሁኔታ እና ተዛማጅ ችግሮቻቸው በአዲስ አበባ ከተማ አሰተዳደር በሚገኙ የተመረጡ የመንግስት ሆስፒታሎች ጥናት በማጥናት የነዚህን ልጆች የስነ ምግብ ሁኔታ እንዲሻሻል ማብረግ ነው፡፡

ሂደት እና የሚወስደው ጊዜ፡- ለዚህ ጥናት ቀጥተኛ መረጃ ለማግኘት ይረዳኝ ዘንድ ከ15 ዓመት እድሜ በታች ለሆኑ ልጆች ተንከባካቢዎች ቃለ-መጠይቅ አደርጋለሁ፡፡ የልጆችን ልኬት ማለትም ክብደት፣ቀመት፣የመካከለኛ እና የላኛውን የክንድ መጠነ ዙሪያ ልኬት እለካለሁ፡፡ በተጨማሪም የልጆችን ማህደር ቅኝት አደርጋለሁ፡፡ በመጠይቅ ውስጥ 37 ጥያቄዎች የሚካተቱ ሲሆን እነዚህን ጥያቄዎች

በመጠቀም የልጆች ተንከባካቢዎች ቃለ-መጠይቅ ይደረግላቸዋል። መጠይቁ የሚወስደው ጊዜ 30 ደቂቃ ይሆናል።

አደጋዎች እና ጥቅሞች፡- በዚህ ጥናት በመሳተፋቸው የሚኖር አደጋ በጣም አነሰተኛ ነው። ነገርግን የልጆች ተንከባካቢዎችን የተወሰነ ጊዜ ይወስዳል። በዚህ ጥናት በመሳተፋቸው ምክንያት የሚከፈላቸው ገንዘብ አይኖርም። ነገርግን በዚህ ጥናት ግኝት መሰረት በእርሶ ሆስፒታል በደማቸው ውሰጥ የኤች አይ ቪ ኤድስ ያለባቸው ከ15 አመት በታች የሆኑ ልጆች የስነምግብ ሁኔታ እና ተዛማጅ ችግሮቻቸው በማሰየት የስነምግብ ፕሮግራም እንዲዘረጋ ይረዳል።

ሚስጥራዊነት፡-የሚሰጡን ማንኛውም መረጃ በሚስጥር ይያዛል። ምንም አይነት መረጃ፤ መረጃ የሰጠውን ግለሰብ ማንነት አያሳይም። የሚገኘው የጥናት ውጤት የተጠኝዎችን ማንነት ወይም የሚኖሩበትን ቦታ በሚያሳይ መልኩ አይቀመጥም። መጠይቁም የግለሰቦችን ማንነት በማያሳይ ሁኔታ ኮድ በመስጠጥ ይዘጋጃል። እርሶ በዚህ ጥናት ስለመሳተፎ ምንም አይነት የቃልም ሆነ የፅሁፍ ፍንጭ አይሰጠም።

መብት፡- በዚህ ጥናት የሚኖሮ ተሳትፎ በርሶ ፍቃደኝነት ላይ የተመሰረት ይሆናል። በዚህ ጥናት ላይ የመሳተፍ ወይም ያለመሳተፍ ፍላጎቶን መግለፀ ይችላሉ። ለመሳተፍ ፍቃደኝነቶን ከገለፁ በኋላ በማንኛውም ሰዓት ከጥናቱ እራሶን ማግለል ይችላሉ።ለዚህም ሊያሰጠይቆ የሚያሰችል ምንም አይነት አላፊነት አይኖርብዎም። መመለስ የማይፈልጓቸው ጥያቄዎች ካሉ ለጥያቄዎች መልስ አለመስጠት ይችላሉ።

ማግኘት፡-ከዚህ ጥናት ጋር በተያያዘ መረጃ ማግኘት ከፈለጉ በሚከተሉት አደራሻ ማግኘት ይችላሉ

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<u>አባሪ 2፡-በእወቀት ላይ የተመሰረተ የበጎ ፍቃድ ስምምነት መግለጫ</u>

በዚህ ጥናት ተሳታፈዎችን የተመለከተውን መረጃ በሚገባ አንብቤዋለሁ/ተነቦልኛል። የዚህን ጥናት አላማ፤የጥናት አካሄድ፤ አደጋዎች፤ ጥቅሞች፤ ሚስጥራዊነት፤ የተሳትፎ መብት እና አድራሻዎች በግልፅ ተረድቻለሁ። ማንኛውንም ግልፅ ያልሆኑ ጥያቄዎችን እንድጠይቅ እድሎች ተሰጠውኛል። በማንኛውም

ጊዜ እራሴን ከጥናቱ ማግለል እንደምችል ወይም ለጥያቄዎች መልስ መስጠት ካልፈለኩ አለመስጠት እንደምችል መረጃ ተሰቶኛል። ስለሆነም በዚህ ጥናት ውስጥ በራሴ በጎ ፍቃድ ለመሳትፍ መስማማቴን በፊርማዬ አረጋግጣለሁ።

የተሳታፊ ስም፡----------ፊርማ----------

የመረጃ ሰብሳቢ ሰም፡----------ፊርማ----------

ማሳሰቢያ፡-ይህ ስምምነት የመረጃ ሰብሳቢ ባለበት መፈረም ይኖርበታል። የዚህን ስምምነት አንዱን ቅጂ ለተሳታፊ መቅረብ ይኖርበታል።

ስለትብብርዎ አመሰግናለሁ!

<u>አባሪ 3: ፡-በእወቀት ላይ የተመሰረተ የበጎ ፍቃድ ስምምነት መግለጫ (ለልጆቹ)</u>

ስሜ ---------- ይባላል። በአዲስ አበባ ዩኒቨርስቲ በተፈጥሮ ሳይንስ እና ቀመር ትምህርት ክፍል ውስጥ የማህበረሰብ ስነምግብ ተማሪ ነኝ ። ዕድሜያቸው ከ 15 ዓመት በታች የሆኑ የኤች አይ ቪ ቫይረስ ተጠቂ ልጆችን የአመጋገብ ሁኔታ ላይ ባለው ጥናት እንድትሳተፍ/ እንድትሳተፊ እጋብዛልው(እጠይቃለው)። ወላጅህ/ሽ/ወይም ተነከባካቢህ/ሽ ስለ ጥናቱ ከእርስዎ ጋር እንደምናወራ/እንደምንነጋገር ያውቃሉ ። ይህ ቅጽ በጥናቱ መሳተፍ መፈለግህን/ሽን ወይም አለመፈለግህን/ሽን ለመወሰን ስለ ጥናቱ ሂደት ይነግርሃል/ሻል።

የጥናቱ ሂደት፡-በጥናቱ ላይ ለመሳተፍ ከወሰንህ/ሽ ክብደት፣ቀመት፣የመካከለኛ እና የላኛውን የክንድ መጠነ ዙሪያ ልኬት እለካለሁ። የአሰራር ሂደቱ 5 ደቂቃ ያህል ይወስዳል ።

የጥናቱ ጥቅም ፡- በዚህ ጥናት ግኝት መሰረት በሆስፒታል ውስጥ የተገኙና በደማቸው ውሰጥ የኤች አይ ቪ ኤድስ ያለባቸው ከ15 አመት በታች የሆኑ ልጆች የስነምግብ ሁኔታ እና ተዛማጅ ችግሮቻቸው በማሰየት የስነምግብ ፕሮግራም እንዲዘረጋ ይረዳል።በአጠቃላይ የዚህ ጥናት ጥቅሙ የኤች አይ ቪ ኤድስ ቫይረስ በደማቸው ውስጥ ያለ (ከአስራ አምስት አመት በታች የሆኑ) ልጆች የስነ ምግብ ሁኔታ እንዲሻሻል ያደሪጋል

የጥናቱ ጉዳት፡- በዚህ ጥናት ውስጥ የመሳተፍ አደጋ አነስተኛ ነው :: ነገር ግን ክብደት፣ቀመት፣የመካከለኛ እና የላኛውን የክንድ መጠነ ዙሪያ ልኬት ለመውሰድ ጥቂት ደቂቃዎችን ብቻ ይወስዳል ።

ሚስጥራዊነት፡-የሚሰጠን/ጪን ማንኛውም መረጃ በሚስጥር ይያዛል። ያንተ/ች ስምም አይመዘገብም።
መብት፡- በዚህ ጥናት የሚደረግ ተሳትፎ በአንተ/ቺ ፍቃደኝነት ላይ የተመሰረት ይሆናል።በጥናቱ ውስጥ ባለመሳተፍህ/ሽ ማንም የሚያስገድድህ/ሽ የለም፣በተጨማሪም ጥናቱ ከተጀመረ በኋላ በማኒኛውም ሰአት የማቀም መብት አለህ/ሽ።

ማግኘት፡-ከዚህ ጥናት ጋር የተያያዘ ጥያቄ ካለ አሁኑኑ አልያም ደገሞ በማነኛውም ሰአት በምቀጥለው አደራሻዬ መጠየቅ ይቻላል፡፡

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በዚህ ጥናት ውስጥ በራሴ በጎ ፍቃድ ለመሳትፍ መስማማቴን በፊርማዬ አረጋግጣለሁ፡፡

የተሳታፊ ፊርማ----------ቀን----------

የመረጃ ሰብሳቢ ሰም፡----------ፊርማ----------ቀን----------

ስለትብብርህ/ሽ አመሰግናለሁ!

<u>አባሪ 4፡ መጠይቆች</u>

ከማህበራዊና ስነህዝባዊ ጋር የተያያዙ ጥያቄዎች		
ተ.ቁ.	መጠይቆች	መልስ
101	የልጆዎት ጸታ	1. ወንድ 2. ሴት
102	የልጆዎት ዕድሜ ስንት ነው	
103	ልጆት ከቫይረሱ ጋር መኖር ከጀመረ ምን ያህል ጊዜ ሆነው	
104	መኖርያ አድራሻዎ የት ነው	1. ገጠር 2. ከተማ
105	የወላጅ ወይም ያሳዳጊ በሕይወት የመኖር ሁኔታ ምን የመስላል	1. ሁለቱም በሕይወት አሉ 2. እናት በሕይወት የለችም 3. አባት በሕይወት የለም 4. ሁለቱም በሕይወት የሉም 5. ተፋትተዋል/ተለያይተዋል
106	አሁን ልጆዎት/ልጆዎቹ ከማን ጋር ነው የሚኖሩት	1. ከወላጅ 2. ከእህት/ወንድም 3. ከአክስት/አጎት 4. ከቅድመ ወላጆች 5. ሌላ ካለ ይግለጹ--------
107	ለጥያቄ ቁጥር. 107 መልስዎት አዎ ከሆነ፡ ማነው/እነማናቸው የሚንከባከቡት	1. እናትና አባቱ 2. እናቱ 3. አባቱ 4. የሃይማኖት አባቶች 5. ሌላ ካለ ይግለጹ--------

108	የቤተሰብዎ የገቢ መጠን ምን ያህል ነው	1. ‹1500 ብር 2. 1501-3000 ብር 3. ›3000ብር
109	የእናት የትምህርት ደረጃ	1. ያልተማረች 2. አንደኛ ደረጃ 3. ሁለተኛ ደረጃ 4. ኮሌጅ እና ከዚያ በላይ
110	የአባት የትምህርት ደረጃ	1. ያልተማረች 2. አንደኛ ደረጃ 3. ሁለተኛ ደረጃ 4. ኮሌጅ እና ከዚያ በላይ
111	የልጆዎት የትምህርት ደረጃ	1. ክፍል 9 እና 10 2. ክፍል1-8 3. መዋዕለ ሕጻናት 4. አቋርጧል 5. እድሜው ለትምህርት አልደረሰም
ከሲዲ ፎር እና ቫይራል ሎድ ቆጠራ ጋር የተያያዙ ጥያቄዎች/የማህደር ቅኝት ሲደረግ/		
112	ለልጁ የሲዲ ፎር መጠን ለመጀምሪያ ጊዜ ተሰረቶለታል	0. አይ 1. አዎ
113	ለጥያቄ ተ.ቁ 112 መልሱ አዎ ከሆነ የሲዲ ፎር መጠኑ ለመጀመሪያ ጊዜ ስንት ነበር	
114	ለልጁ የሲዲ ፎር መጠን አሁን ላይ ተሰረቶለታል?	0. አይ 1. አዎ
115	ለጥያቄ ተ.ቁ 114 መልሱ አዎ ከሆነ የሲዲ ፎር መጠኑ አሁን ላይ ስንት ነው?	
116	ባለፈው አንድ አመት ውስጥ ቫይራል ሎድ ትሰረቶዋል	0. አይ 1. አዎ
117	ለጥያቄ ተ.ቁ 116 መልሱ አዎ ከሆነ የቫይራል ሎድ መጠኑ ስንት ነበር	
ከተጓዳኝ ህመም ጋር የተያያዙ መጠይቆች		
118	ልጆዎት ሌላ ተጓዳኝ ህመም አለበት	0. አይ 1. አዎ
119	ለጥያቄ ተ.ቁ 121 መልስዎ አዎ ከሆነ፤ ልጆዎት ምን አይነት ተጓዳኝ ህመም አለበት	1. ተቅማጥ 2. የሳምባ ህመም 3. የሳምባ ምች 4. የቆዳ ቁስለት 5. ሌላ ካለ ይጥቀሱ----------
ከኤእይ ቪ መድሀኒት ጋር ተያይዞ ስላሉት ተግባቦትን የሚመለከቱ ጥያቄዎች		

120	ስለ ኤች አይ ቪ መድሀኒት ያሎት ተግባቦት ምን ይመስላል	1. ጥሩ ነው 2. ጥሩም መጥፎም አይደለም 3. ጥሩ አይደለም
121	ስለ ኤች አይ ቪ መድሀኒት ፕሮግራመ ያሎት ተግባቦት ምን ይመስላል	1. ጥሩ ነው 2. ጥሩም መጥፎም አይደለም 3. ጥሩ አይደለም
122	ልጆዎት የኤች አይ ቪ መድሐኒት ሳይወስድ ቆይቷል	0. አዎ 1. አይ
123	ለጥያቄ ተ.ቁ 122 መልስዎ አዎ ከሆነ፤ለምን ያህል ጊዜ ቆየ?	
124	የልጆዎት ክብደት የኤች አይ ቪ መድሀኒት ከጀመረ በኋላ እነዴት ነው	1. ጨምሯል 2. ቀንሷል 3. ያው ነው 4. አላውቅም
የልጆዎት አመጋገብ ሁኔታን የተመለከቱ መጠይቆች		
126	የልጆዎት የቁርስ አመጋገብ ሁኔታ ምን ይመስላል	1. አንዳንዴ 2. ሁልጊዜ
127	የልጆዎት ምሳ አመጋገብ ሁኔታ ምን ይመስላል	1. አንዳንዴ 2. ሁልጊዜ
128	የልጆዎት እራት አመጋገብ ሁኔታ ምን ይመስላል	1. አንዳንዴ 2. ሁልግዜ
129	ልጆዎት መክሰስ ይመገባል	0. አይ 1. አዎ
130	እድሜያቸው ከ 6 ወር በታች የሆኑ ህፃናት የአመጋገብ ሁኔታ ምን ይመስላል	1. የእናት ጡት ብቻ 2. ተጨማሪ ምግብ 3. ጡትናተጨማሪ ምግብ
131	ልጆዎት ጡት ለምን ያህል ጊዜ ጠባ	
132	ለልጆዎት ተጨማሪ ምግብ በተገቢው ሰአት ጀምረውለታል	0. አይ 1. አዎ
133	ለልጆዎት ተጨማሪ ምግብ መቼ ነው የጀመሩት	1. ከስድስት ወር በፊት 2. በስድስት ወሩ 3. ከስድስት ወር በኋላ 4. እስካሁን አልጀመረም 5. አላውቅም
134	ለልዎጆት የስነ-ምግብ ምክር አግኝተዋል	0. አይ 1. አዎ
135	ልጆዎት አሁን የምግብ እርዳታ እያገኘ ነው	0. አይ 1. አዎ

136	ለጥያቄ ተ.ቁ.146 መልስዎ አዎ ከሆነ ፤ምን አይነት የምግብ እርዳታ እያገኙ ነው	1. ቫይታሚን ኤ 2. ፕላፕሌት 3. ወተት 4. ሌላ ካለ ይጥቀሱ
137	ልጆዎት የመመገብ ችግር አለበት	0. አይ 1. አዎ
138	ለጥያቄ ተ.ቁ.147 መልስዎ አዎ ከሆነ፤ልጆዎት ምን አይነት የመመገብ ችግር አለበት	1. የምግብ ፍላጎት መቀነስ 2. የመዋጥ ችግር 3. ማቅለሽለሽ/ማስታዎክ 4. በራሱ ማስታዎክ 5. ሌላ ካለ ይጥቀሱ

<u>አባሪ አምስት</u> <u>አጠቃላይ የሰውነት ልኬት</u>

ዕድሜያቸው 15 ዓመት በታች የሆኑ ኤች አይ ቪ ቫይረስ በደማቸው ውስጥ ያለ ህፃናት ቁመት	…….ሴሜ
ዕድሜያቸው 15 ዓመት በታች የሆኑ ኤች አይ ቪ ቫይረስ በደማቸው ውስጥ ያለ ህፃናት ክብደት	…….ኪግ
ዕድሜያቸው ከ 6 ወር በላይና ከ 15 ዓመት በታች የሆኑ ኤች አይ ቪ ቫይረስ በደማቸው ውስጥ ያለ ህፃናት የመሃል ክንድ ዙሪያ ልኬት	…….ሴሜ

ANNEX 6: Curriculum Vitae (Student)

1. PERSONAL INFORMATION	
Full Name	Teklu Assefa Engida
Sex	Male
Date of Birth	04/10/1990
Nationality	Ethiopian
Address	Tel. +251913972144 E-Mail: assefateklu1221@gmail.com

2. Education		
Degree Course attended	Institution	Year
❖ BSc in Neonatal Nursing specialty	Menelik II health Science College, Ethiopia	2017
❖ BSc in Applied Human Nutrition	Bahir Dar University, Ethiopia	2018
❖ Level-IV diploma in Clinical Nursing	Menelik II health Science College, Ethiopia	2012

3. Trainings and Conferences Attended	Institution	Year
❖ Problem Based Learning (PBL)	Addis Ababa city of Administration Ethiopia	’2018
❖ Basic Clinical Training Skill course	Addis Ababa city of Administration Health Bureau , Ethiopia	2018
❖ Gender and Gender Based Violence	Addis Ababa city of Administration Health Bureau, Ethiopia	2018
❖ Basic prevention mother to child transmission	Center for Disease Prevention and Control(CDC), Ethiopia	2018
❖ Effective teaching skill	Addis Ababa city of Administration Health Bureau, Ethiopia	2018
❖ Basic provider-Initiative HIV Testing And counseling	Addis Ababa city of Administration Health Bureau, Ethiopia	2014
❖ Syndrome management of Sexually Transmitted infections	Addis Ababa city of Administration Health Bureau, Ethiopia	2014

❖ Simulation training organized	Jhpiego, Jigiga University ,Ethiopia	2009
❖ Computer basic skill	Vm Ware Computer training Center	2014
❖ Trainer's Methodology(TM) Training	Addis Ababa city of Administration Technical Vocational Education and Training Agency, Ethiopia	2013

4. Experience

Position	Organization/Institution	Year
❖ Assistant lecturer	Menelik II Health Science College	2018
❖ Skill lab Coordinator	Menelik II Health Science College	2017
❖ Graduate Assistant II	Menelik II Health Science College	2017
❖ Technical Assistant	Menelik II Health Science College	2012- 2016
❖ Junior Clinical Nurse	Menelik II Referral Hospital	2012

5. Special Awarded	Institution	Year
Certificate of appreciation on Nursing skill lab arrangement	Menelik II Health Science College	2017

6. Language

	Listening	Writing	Reading
English:	Advanced User	Advanced User	Advanced User
Amharic:	Proficient user	Proficient user	Proficient user

7. References

Name	Position	Relationship	E-Mail and telephone
Fikirte Weldeselassie	Lecturer	Supervisor	woldeselassiefikirte@yahoo.co 0911417846

ANNEX 7: Curriculum vitae(Advisor)

Name: Zeweter Abebe

Gender: Female

Tel: 0911878094

Email: Zeweterab@gmail.com

Education

IMMANA Post-doctoral Fellow: University of California Davis & Addis Ababa University

- Project title*: Home Gardening and Breastmilk Vitamin A*

PhD in Food Science and Nutrition*:* Center for Food Science and Nutrition, Addis Ababa University; *collaborators*: Potsdam University, Potsdam, Germany & University of Massachusetts, Amherst, USA

- Dissertation title*: Complementary Food and Feeding Practices*

Professional experiences

Assistance professor: Addis Ababa *University, Addis Ababa, Ethiopia and Ambo University, Ambo, Ethiopia*

Languages

Amharic	Fluent/native
English	Excellent

Short term trainings

- **Qualitative Research Methods and Analysis**
  - Organizer: Addis Continental Institute of Public Health
- **Programming for Infant and Young Child Nutrition**
  - Organizer: Cornell University USA & UNICEF
- **Linking emergency aid to food and nutrition security**
  - Organizer: Center for Development Innovation, Wageningen, UR
  - Country: Wageningen, Netherlands
- **Monitoring, evaluation and impact assessment of food and nutrition security programmes**
  - Organizer: Center for Development Innovation, Wageningen, UR
  - Country: Wageningen, Netherlands
- **Future food**

- Country: Potsdam, Germany
- Organizer: Potsdam summer school of international nutrition

➢ **Skills for successful publishing**

- Organizer: University of Michigan and AAU
- Country: Addis Ababa, Ethiopia

Conferences

➢ **ANH Academy week**

- *Accra, Ghana*

➢ **Ethiopian Public health association 29th annual scientific conference**

- *Organizer: EPHA*
- *Country: Addis Ababa, Ethiopia*

➢ **Reproductive, maternal, child health and nutrition research advisory council (RAC) first national research conference**

- *Organizer: Ministry of health, Ethiopia*
- *Country: Addis Ababa, Ethiopia*

➢ **European nutrition conference**

- *Country: Berlin, Germany*
- *Organizer: Federation of European Nutrition Societies (FENS)*

➢ **Micronutrient forum, Global conference**

- *Country: Addis Ababa, Ethiopia*
- *Organizer: The United Nations Economic Commission for Africa*

Conference papers

➢ **Status of Nutrition Component of the Primary Health Care Program in Rural Ethiopia: the case of IYCF**

- *EPHA 29th annual scientific conference*
  United Nations conference center, Addis Ababa, Ethiopia,

➢ **Narrowing Disparities in Nutrition Related Health Outcomes Among Young Children in Rural Ethiopia: What works?**

- *2nd international nutrition conference*
  Jigjiga University,

➢ **Addressing Chronic Malnutrition Among Young Children Spans Multiple Sectors in Rural Ethiopia**

- *NNP II review meeting*
  Ministry of health,

➢ **Building the Evidence-base for Effective communication strategies to improve child feeding in rural Ethiopia,** *European nutrition conference*

Professional membership association

- Ethiopian Public health association
- Agriculture Nutrition & Health Academy
- Food and Nutrition Society of Ethiopia (FoNSE)
- Ethiopian Horticulture association

Fellowships/grants/award

- IMMANA postdoctoral fellowship
- Nutricia research foundation, Donane, Netherlands, research grant
- DAAD in country PhD scholarship, Germany
- Development Innovative fund (DIF) MSc. scholarship, Canada
- Best of female students award, Jimma University

Peer reviewed publications

Abebe Z, Haki GD, Baye K. Simulated effects of home fortification of complementary foods with micronutrient powders on risk of inadequate and excessive intakes in West Gojam, Ethiopia. ***Matern Child Nutr***. *2017; e12443.http://doi.org/10.1111/mcn.12443*

Abebe Z, Haki GD, Baye K. Child feeding style is associated with food intake and linear growth in rural Ethiopia. ***Appetite*** 116 (2017) 132-138.

Abebe Z, Haki GD, Baye K. Health Extension Workers Knowledge and Knowledge-Sharing Effectiveness of Optimal Infant and Young Child Feeding Are Associated With Mothers Knowledge and Child Stunting in Rural Ethiopia. ***Food Nutr Bull***. 2016;1–11.

Abebe Z, Haki GD, Schwigert F, Baye K. Low breast milk vitamin A concentration is prevalent in rural Ethiopia. ***Eur J Clin Nutr***. 2018. doi: 10.1038/s41430-018-0334-4.

ANNEX 8: Ethical clearances

COLLEGE OF NATURAL & COMPUTATIONAL SCIENCES
Addis Ababa University
OFFICE OF THE DEAN
የዲን ጽ/ቤት

የተፈጥሮና ኮምፒቴሽናል ሣይንስ ኮሌጅ
አዲስ አበባ ዩኒቨርሲቲ

Ref. No.
ቁጥር CNSDO/302/12/2020
Date:
ቀን፡ January 23, 2020

To:- Addis Ababa Health Bureau
Addis Ababa

The College of Natural & Computational Sciences Institutional Review Board (**CNS-IRB**) Committee in its meeting held on 20/12/2019 Minute No. IRB/42/2019 has examined the project proposal entitled **"Nutritional Status of HIV Positive Children Less than 15 Years Old and Associated Factors in Selected Governmental Hospitals in Addis Ababa Ethiopia, 2019'' by Teklu Assefa** from the Addis Ababa University.

The proposal is approved for implementation.

With regards,

Addisalem Abathun, PhD
Dean, College of Natural & Computational Sciences

ሥልክ/Tel.+251-11-123-94-72
ፋክስ/Fax: +251-11-123-94-69
ፖ.ሣ.ቁ/P.O.Box 1176 Addis Ababa, Ethiopia
ኢ.ሜል/Email: dean_cns@aau.edu.et

አዲስ አበባ ከተማ አስተዳደር ጤና ቢሮ
City Government of Addis Ababa Health Bureau

Ref.No A/A/8373/227
Date 25/5/2012

TO:

- **Zewditu Memorial Hospital**
- **Yekatit 12 Medical College Hospital**
  Addis Ababa

Subject: Request to access Facilities to conduct approved research

The letter is to support **Teklu Assefa** of **"Nutritional Status of HIV positive children less than 15 years old and associated factors in selected Governmental hospitals in Addis Ababa Ethiopia, 2020."** The study proposal was duly reviewed and approved by Addis Ababa Health Bureau IRB, and the principal investigator is informed with a copy of this letter to report any changes in the study procedures and submit an activity progress report to the Ethical Committee as required. Therefore we request the facility and staffs to provide support to the principal investigator.

With Regards

Dr. Yohannes W/kidan

Ethical Clearance Committee

Cc

- **Teklu Assefa**
- **To Ethical Clearance Committee**
  Addis Ababa

አዲስ አበባ ከተማ አስተዳደር ጤና ቢሮ
City Government of Addis Ababa Health Bureau

Ref.No A/A/9373/247
Date 25/5/2012

TO:

- Zewditu Memorial Hospital
- Yekatit 12 Medical College Hospital

Addis Ababa

Subject: Request to access Facilities to conduct approved research

The letter is to support **Teklu Assefa** of **"Nutritional Status of HIV positive children less than 15 years old and associated factors in selected Governmental hospitals in Addis Ababa Ethiopia, 2020."** The study proposal was duly reviewed and approved by Addis Ababa Health Bureau IRB, and the principal investigator is informed with a copy of this letter to report any changes in the study procedures and submit an activity progress report to the Ethical Committee as required. Therefore we request the facility and staffs to provide support to the principal investigator.

With Regards

Dr. Yohannes W/kidan

Ethical Clearance Committee

The Addis Ababa City Administration Health Bureau

Cc

- **Teklu Assefa**
- **To Ethical Clearance Committee**

Addis Ababa

			ፊርማ
የደረሰበት ቀን 26/05/12			
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የተላለፈበት ቀን			

COLLEGE OF NATURAL & COMPUTATIONAL SCIENCES
Addis Ababa University

የተፈጥሮና ኮምፒዩቴሽናል ሣይንስ ኮሌጅ
አዲስ አበባ ዩኒቨርሲቲ

OFFICE OF THE DEAN

Ref. No. CNSDO/302/12/2020

ቀን Date January 28, 2020

የዲን ጽ/ቤት

To:- Alert Hospital
Addis Ababa

The College of Natural & Computational Sciences Institutional Review Board (**CNS-IRB**) Committee in its meeting held on 20/12/2019 Minute No. IRB/42/2019 has examined the project proposal entitled **"Nutritional Status of HIV Positive Children Less than 15 Years Old and Associated Factors in Selected Governmental Hospitals in Addis Ababa Ethiopia, 2019" by Teklu Assefa** from the Addis Ababa University.

The proposal is approved for implementation.

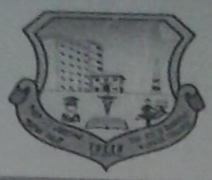
ደብዳቤ የተጻፈበት ቀን 28/1/20
- 29/1/20
02908

With regards,

Addisalem Abebe, PhD
Dean, College of Natural & Computational Sciences

ሥልክ/Tel.+251-11-123-94-72
ፋክስ/Fax: +251-11-123-94-69
ፖ.ሣ.ቁ/P.O.Box 1176 Addis Ababa, Ethiopia
ኢ-ሜይል/Email: dean_cns@aau.edu.et
Please Quote our reference number in you correspondence

የካቲት 12 ሆስፒታል ሜዲካል ኮሌጅ
Yekatit 12 Hospital Medical College



የምርምርና ህትመት ቢሮ
Research and Publication office

Date: February 24, 2020

Meeting number: 06
Meeting date: February 12, 2020
Protocol number: 10/20
Protocol Title: Nutritional Status of HIV positive children less than 15 years old and associated factors in selected governmental Hospitals in Addis Ababa, Ethiopia
Principal investigator: Teklu Assefa (BSc)
Institution: College of natural and computational sciences, AAU

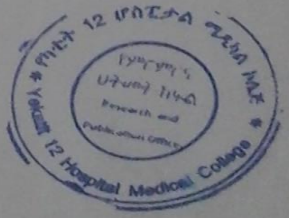
Subject: Issueing ethical Clearance

The Institutional Review Board (IRB) of Yekatit 12 Hospital Medical College has thoroughly reviewed the research protocol and granted ***full approval*** for a period of one year (**February 12, 2020 to February 11, 2021**). The study should comply with standard international and national scientific ethical guidelines. Any change to the approved protocol or consent form must be approved through the amendment process prior to its implementation. Any adverse or unanticipated events should be reported within three days to the IRB of the college. Please ensure that you submit biannual report once in six months and renewal application 30 days prior to the expiry date.

We, therefore, request you to ensure the commencement and conduct of the study accordingly and wish for the successful completion of the project.

Does the protocol require national research ethics review?

YES ☐ NO ☒



Regards,

ዶ/ር አለም አብርሃ
Dr. Alem Abrha Kalayu (PhD)
Assistant Professor of M/Microbiology
የምርምርና ህትመት አስተባባሪ
Research and Publication Coordinator