
# ADDIS ABABA UNIVERSITY

# COLLEGE OF HEALTH SCIENCES

# SCHOOL OF PUBLIC HEALTH

## MASTER OF PUBLIC HEALTH IN NUTRITION THESIS

**TITLE: - Child Undernutrition and Infant and Young Child Feeding Indicators: a Secondary Analysis of EDHS 2011.**

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**Child Undernutrition and Infant and Young Child Feeding Indicators: a Secondary Analysis of EDHS 2011.**

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## List of Abbreviations

| | |
|---|---|
| BF | Breastfeeding |
| BMI | Body Mass Index |
| CSA | Central Statistical Agency |
| CF | Complementary Feeding |
| DDI | Dietary Diversity Index |
| DHS | Demographic and Health Survey |
| DALYs | Disability-Adjusted Life Years |
| EDHS | Ethiopian Demographic and Health Survey |
| HAZ | Length-for-Age or Height-for-Age |
| ISF | Introduction of Solid, Semi-Solid or Soft Foods |
| IYCF | Infant and Young Child Feeding |
| LAZ | Length for Age Z score |
| MAD | Minimum Acceptable Diet |
| MDD | Minimum Dietary Diversity |
| MFI | Meal Frequency Index |
| MMDA | Mean Micronutrient Density Adequacy |
| MMF | Minimum Meal Frequency |
| UNICE | United Nations International Children's Emergency Fund |
| WAZ | Weight-for-Age Z score |
| WHZ | Weight-for-height Z score |
| WHO | World Health Organization |
| OPD | Outpatient Department |

## ABSTRACT

**Background**: - Optimal Infant and Young Child Feeding (IYCF) practices play an important role in reducing early childhood morbidity and mortality, as well as in improving early child growth and development. There are different predictors of child nutritional outcomes like economic and contextual factors. But infant nutritional status (stunting, wasting and underweight) can be associated with an immediate cause such as infant feeding practice.

**Objectives**: To determine the association between WHO core IYCF indicator and different forms of child under nutrition in Ethiopia.

**Methods**: Data from the 2011 Ethiopia Demographic Health Surveys (EDHS), which is nationally representative data, were used. The study subjects were Last born infants and their mothers.Analyses were conducted using multiple linear regression and logisticregression analyses adjusted for the complex survey design of the survey, controllingfor child, maternal and household characteristics.Regression models used the 'svy' command in STATA to ensure that standard errors &adjusted for the complex survey design.

**Result:** A total of 3826 children are included in the analysis. After adjusting for possible confounders minimum acceptable diet (AOR 0.39, 95%CI 0.18-0.84) & minimum diet diversity with (AOR 0.48 95% 0.24-0.96) was found to be significantly associated with stunting. Similarly minimum acceptable diet (AOR 0.36, 95%CI 0.13-0.98) & minimum diet diversity (0.33 95%CI (0.12-0.87) was found to be significantly associated with underweight. Among the IYCF indicators only minimum meal frequency (AOR 0.70, 95% 0.51-0.96) was found to be significantly associated with wasting.But exclusive breastfeeding (EBF) had no association with underweight.

**Conclusion & Recommendation:** Achieving Minimum acceptable diet and minimum diet diversity are protective against stunting and underweight. And minimum meal frequency was still protective against wasting. Programmatic interventions that support a focus on complementary feeding and EBF should be implemented**.**

# 1. INTRODUCTION

## 1.1 Background

Globally, childhood undernutrition is one of the most important public health challenges. When considering all causes of under-5s mortality worldwide, it is estimated that 35% of these deaths are attributable to malnutrition(1).WHO defines optimal infant feeding as initiating breastfeeding within one hour of birth, breastfeeding exclusively for the first six months, starting complementary food at six months post-delivery, continuing to breastfeed for two years, breast feeding day and night at least 8 times, the giving of colostrum, no pre-lacteal feeds, no bottle feeding and responsive feeding of solid, semi-solid food(2).

The first indicatorfor assessingchild feeding was published in 1991 (3) and include set of breast feeding promotion and timely introduction of complementary feeding rate consumed, but not about the quality of those foods. The current indicator are result of a 5 year effort to develop a set of simple ,valid ,and reliable indicators to assess infant and child feeding practices published in 2008.Consensus reached on 8 core indicators and 7 optional indicators for assessing infant and young child feeding that are population-based and can be derived from household survey data (4).

World Health Organization Infant and Young Child Feeding Core Indicators, 2008 includes:- Breastfeeding indicators:- Early initiation of breastfeeding Proportion of children born in the last 24 months who were put to the breast within 1 h of birth, Exclusive breastfeeding under 6 months Proportion of infants 0–5 months of age who were fed exclusively breast milk during the previous Day&Continued breastfeeding at 1 year Proportion of children 12–15 months of age who were fed any breast milk during the previous day.

Complementary feeding indicators:- Introduction of solid, semi-solid or soft foods Proportion of infants 6–8 months of age who received solid, semi-solid or soft foods during the previous day, Minimum dietary diversity Proportion of children 6–23 months of age who received foods from 4 or more food groups during the previous day, Minimum meal frequency Proportion of breastfed and non-breastfed children 6–23 months of age who received solid, semi-solid or soft foods (but also including milk feeds for non-breastfed children) the minimum number of times or more during the previous day, Minimum acceptable diet Proportion of children 6–23 months of age who had at least the minimum dietary diversity and minimum meal frequency (apart from breast milk) during the previous day &Consumption of iron-rich or iron-fortified foods

Proportion of children 6–23 months of age who received an iron-rich food or iron-fortified food that is specially designed for infants and young children, or that is fortified in the home during the previous day.

All key IYCF practices were suboptimal in Ethiopia, except continued breast feeding at 12 -15 months. Especially, complementary feeding practices were very few in Ethiopia among children aged 6-23 months old (5). Overall, the associations between IYCF indicators and child anthropometry were mixed in most countries with complementary feeding practices showing stronger and more positive associations with child anthropometry than breast feeding practices (5, 6).

## 1.2 Statement of the Problem

Infant and young child feeding practices directly affect the nutritional status of children under two years of age and, ultimately, impact child survival. Improving infant and young child feeding practices in children 0–23 months of age is therefore critical to improved nutrition, health and development of children (4). Sub-optimal breastfeeding practices are estimated to be responsible for more than a million child deaths and 44 million disability-adjusted life years (DALYs), which account for 10 % of DALYs in children younger than 5 years (7).In children over 2 years of age, the effects of these long-term factors of stunting will not be reversible (8). About one third of deaths in children under 5 years of age are due to underlying under nutrition, which includes stunting, severe wasting, deficiencies of vitamin A and zinc, and suboptimum breastfeeding (9).

There are different predictors of child nutritional outcomes like economic and contextual factors. But infant nutritional status (stunting, wasting and underweight) can be associated with an immediate cause such as infant feeding practice (6).

An analysis of 19 Demographic and Health Surveys (DHS) indicated that prevalence of severe wasting was higher at younger ages and declined by 24 months while stunting prevalence peaks around 24 months and plateaus at a high level thereafter (1). Thus, it is necessary to examine the role of IYCF practices in relation to all three indicators. The pattern of association between the WHO IYCF indicators and child anthropometry varied widely across different country data set (6). Most of the research done assessed cross-country patterns, even though this increase power and precision it may also hide important variability across countries. Therefore, country-specific analyses of relationships between these IYCF indicators and child anthropometry isneeded (6).

A study was done using Ethiopian DHS to compare IYCF indicators with child anthropometry, but this study was still comparing the data from Ethiopia with Zambia, so variability across countries still remained hidden.

## 1.3 Significant of the Study

Appropriate infant and young child feeding practice are critical to child nutrition. Thus, these feeding practices may affect child nutritional status which in turn affects the anthropometric measurements. This study has a role in determining the association between indicators of infant and young child feeding (IYCF) and anthropometric measures of nutritional status. It also has a role in estimating the degree of association between IYCF indicator and anthropometric measurements. We can see the potential limitation and strength of the indicators when used different purpose.

# 2. LITERATURE REVIEW

## 2.1 Creating an Infant and Young Child Feeding Index

The DHS surveys are nationally representative data sets and constitute the richest sources of information on child feeding and nutrition currently available for most countries (10). Using this datasets a child feeding index (CFI) was crated including the dimension of breastfeeding practices, dietary diversity, food frequency, and meal frequency in five Latin-American countries (11) and Ethiopia (12) using 1994-1999 & 2000 DHS data respectively. The data shows association with HAZ, WHZ and WAZ, but strong association was seen between diet diversity and height for age. These findings were confirmed by multivariate analyses that controlled for child, maternal and family characteristics. Using CFI (13) almost all positive CF practices show Significant associations between nutritional status of the children as measured by HAZ and WAZ ( $p<0.01$), but not with WHZ, Whereas maternal education was the most significant factor than Infant CFI.

## 2.2 WHO current core IYCF Indicators and Its Association with Wasting

Using national representative data all key IYCF practices were sub optimal in Ethiopia, Zambia, Bangladesh and India, except continued breastfeeding at age 12–15 months (5, 14, 15).

Exclusive breastfeeding and minimum meal frequency were positively associated with WHZ in Ethiopia, Zambia & Bangladesh (5, 6, 14). The analysis indicated that EBF was protective against wasting among children 0-6 months of age by protecting from infectious disease, boosting immunity and because it is safe from contamination (16, 17). Minimum acceptable diet(MAD) was positively associated with wasting in Zimbabwe(6), but MAD was not positively associated in Zambia, Ethiopia (5). Incounterary, timely introduction of solids was negatively associated with WHZ at 6–8 months. There was no association of early initiation of breastfeeding, continued breastfeeding at 12 months, minimum dietary diversity, or iron rich foods with WHZ or wasting (6).

## 2.3 WHO Current Core IYCF Indicators and Its Association with Underweight

Exclusive BreastFeeding was positively associated with WAZ in Zambia. Continued breast-feeding was negatively associated with WAZ in Zambia and Ethiopia. Minimum acceptable diet was positively associated with WAZ in Zambia and Ethiopia (5). Additionally, a significant, positive linear association was found between age-appropriate introduction of solid, semi-solid

and soft foods and better dietary diversity and WAZ. The lack of finding an association between exclusive breastfeeding and stunting or underweight was unsurprising in this context; both stunting and underweight are lower than wasting in the 0–6 month age group and increase later in infancy (18). This pattern is seen in the Bangladesh DHS data (14).

An analysis of pooled DHS data from 14 low-income countries suggested that probability of being underweight was significantly lower for those who initiated breastfeeding within the first hour after birth ($P < 0.05$). Higher maternal education was significantly associated with a lower risk of underweight among mothers, who initiated breastfeeding in the first hour ($P < 0.01$).Among children aged 12–15 months, those who were currently breastfeeding had a significantly higher rate of being underweight ($P < 0.001$). For underweight, a significant relationship was observed for the high-education group ($P < 0.01$), but not the low-education group. For infants aged 6–8 months, consumption of solid foods was associated with significantly lower probabilities of underweight ($P < 0.001$) (19).

This relationship was observed for both the low- and high-education groups ($P < 0.001$). A significant association of feeding frequency and underweight was found($P < 0.05$). Consuming a minimum acceptable diet was associated with a significantly lower overall probability of being underweight ($P < 0.01$), There was no significant relationship between minimum acceptable diet and underweight for either education subgroup. Consumption of IFF was associated with a lower risk of underweight ($P < 0.001$). A significant relationship was also observed separately for the low- and high-education groups ($P < 0.05$ or $P < 0.001$, respectively, for both measures). Dietary diversity was associated with a significantly lower risk of underweight ($P < 0.001$).For this outcomes, this relationship was significant for the high-education group for outcome measures ($P < 0.001$), but was not significant for the low-education group. Generally meeting all the core IYCF indicators except minimum meal frequency was associated with less likelihood of underweight (19).

Among the core IYCF indicators, improved dietary diversity and minimum acceptable diet are associated with WAZ ($P < 0.05$) as well as with lower odds of being underweight, after controlling for the variables. The timely introduction of solid, semi-solid or soft foods is associated with a significantly decreased likelihood of being underweight. The association between the dietary diversity indicator and WAZ individually is significant ($P < 0.001$). Additionally, as diet diversity increases, the odds of underweight decrease ($P < 0.05$).

The summary IYCF indicator of minimum acceptable diet predicts an increase of WAZ of 0.13 ($P < 0.01$) (15).

### 2.4 WHO Current coreIYCF Indicators and its association with Stunting/HAZ

A systematic study using recent Demographic and Health Surveys data from a total of nine countries in sub-Saharan Africa (nine), Asia (three) and the Caribbean (one) show exclusive breastfeeding (EBF) was significantly positively associated with HAZ in Haiti (P<0.05). EBF under 6 months was negatively associated with HAZ in seven of the data sets assessed; however, this association was significant only in Ethiopia and Kenya (P<0.01 and P<0.050 respectively). Continued BF at 1 year was also significantly negatively associated with HAZ in Ethiopia as well as Zimbabwe (P<0.01 and P<0.05 respectively), and demonstrated similar, although non-significant, trends in all other countries (6).

The ISF indicator was positively associated with HAZ in Bangladesh and Zambia (P < 0.01), and the odds of stunting were significantly lower for children 6–8 months of age in Bangladesh who achieved this indicator (P<0.01). The minimum diet diversity (MDD) indicator was positively associated with HAZ in Bangladesh, India and Zambia (P<0.05), and the odds of stunting were lower in children in India who achieved the MDD indicator (P<0.001).Achieving the MAD indicator was similarly associated with a higher HAZ in these same three countries as well as in Ethiopia (P <0.05). In Zimbabwe, the odds of stunting were significantly lower for children aged 6–23 months who met the MAD indicator (P <0.05). The MMF and iron rich food (IRF) indicators were not associated with HAZ or stunting in any of the data sets that assessed these relationships (6).

The other study shows none of the WHO IYCF indicators was associated with LAZ, whereas CFI showed significant association with LAZ,but association between higher CFI scores and LAZ became weaker as age increased. This is because the negative associations between CFIs and LAZ in any age-sub groups are related to neglected components of infant and young child feeding practices in the different CFIs used or explained by poor statistical power therefore it needs further investigations (20).

Late and early introduction complementary foods were also significantly associated with stunting; by reduces the duration and frequency of breastfeeding and increases risk of infant morbidity and mortality (14, 21, 22). The analysis of 11 DHS data confirm that Dietary diversity was significant as a main effect in 7 countries in multivariate models, and interacted significantly

with other factors (e.g., child age, breastfeeding status, urban/rural location) in 3 of the 4 remaining countries, and lack of association was obtained only 1 country in this analysis (23).

## 2.5 WHO core IYCF indicators and child nutrition in Ethiopia

Exclusive breast-feeding & continued breast-feeding at 12-15 months of age was negatively associated with child HAZ in Ethiopia,and also EBF was positively associated with WHZ. Among complementary feeding indicators, children 6-23 months of age, having adequate dietary diversity, consumption of a minimally acceptable diet, and consumption of iron-rich foods were positively associated with HAZbut only Minimum acceptable diet was positively associated with WAZ, but not with WHZ. And also Meal frequency was positively associated with HAZ in Ethiopia (5).

In Ethiopia, female children & Mothers who completed secondary school have shown to have significantly higher WAZ and WHZ compared to their female& Mothers who didn't completed secondary school. Place of residence was not associated with any anthropometric indicator. Socio-economic condition as measured by wealth quintile showed a marginal effect on the undernutrition outcomes. Being breastfed at the time of survey had higher HAZ and WAZ in Ethiopia ($p<0.01$ and $p<0.05$, respectively) (5).

# 3 OBJECTIVE

## 3.1 General Objective:

- To determine the association between the WHO core IYCF indicators and nutritional status among children 0-23 months in Ethiopia, 2011.

## 3.2 Specific Objectives:

- To determine the association between WHO core IYCF indicator and stunting
- To determine the association between WHO core IYCF indicator and wasting
- To determine the association between WHO core IYCF indicator and underweight

# 4 METHODS

## 4.1 Data Source

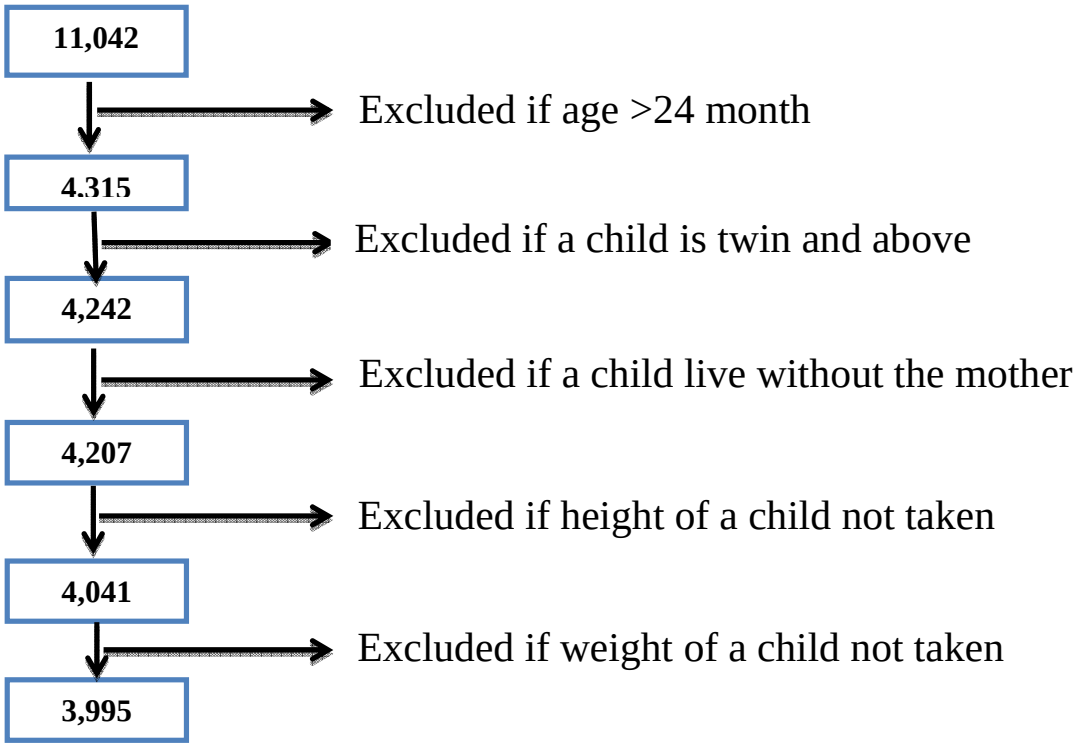
Secondary data from 2011 EDHS (25), which is nationally representative data is used to answer the study objective.Data from the children's recoded data set containing one record for every child born in the last 5 years to the women included in the survey were used in this analysis. For the purpose of this analysis, the data on infants and young children 0–23 months old were used.

## 4.2 Study Design

The DHS data used cross-sectional study design

## 4.3 Study Population

Data from the children's re-coded data set, which contains one record for every child of eligible women who were born in the last 2 years (0–23 months of age), were adjusted for cluster sampling and sampling weights for the present analysis. Children who were not alive during the interview or had a missing age variable ,data if a child age is >24 months, if a child is twin, if a child lives without their mother, if a child and a mother with incomplete anthropometric measurements and flagged cases in calculating standard deviation of a mother and a child were excluded from the sample.Therefore the total sample size of3826children age from 0-23 months is included. The sample size was adequate for our objective.



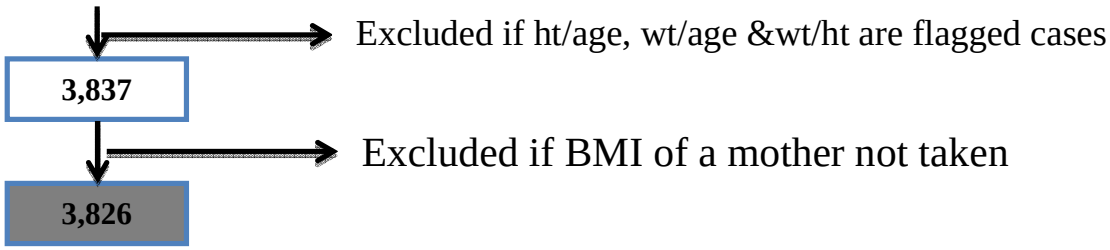



Figure 1:- study population of a child age 0-23 months from child file using 2011 EDHS in Ethiopia, 2016

## 4.4 Sampling Method of EDHS

The sample for the EDHS was designed to provide population and health indicators at the national (urban and rural) and regional levels. 2007 Population and Housing Census, conducted by the CSA, provided the sampling frame from which the 2011 EDHS sample was drawn. Administratively, regions in Ethiopia are divided into zones, and zones, into administrative units called weredas. Each weredais further subdivided into the lowest administrative unit, called kebele.The EDHS sample was selected using a stratified, two-stage cluster designs, Primary sampling units are Enumeration Areas and Secondarysampling units are Households.

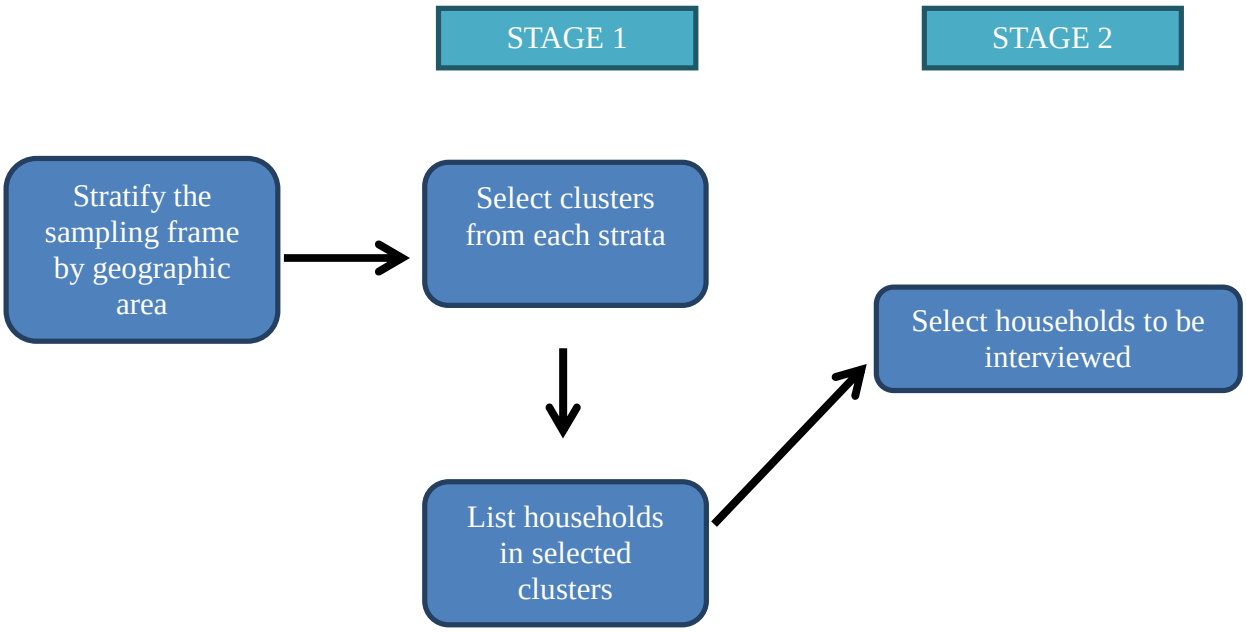



Figure 2: Sampling procedure of DHS data

## 4.5 Data Collection of EDHS

Structured questionnaire are used to collect information. Three questionnaires were administered for the 2011 EDHS: the Household Questionnaire, the Women's Questionnaire, and the Men's Questionnaire. These questionnaires were adapted to reflect the population and health issues relevant to Ethiopia.But I used Women's Questionnairespecifically child file to answer my objective.

Instruments used for anthropometric measurement: - weight measurements were obtained using lightweight, SECA mother-infant scales with a digital screen, designed and manufactured under the guidance of UNICEF. Height measurements were carried out using a measuring board. Children younger than 24 months were measured for while lying down, and older children, while standing.

Anthropometric measures of nutritional status, namelyheight-for-age Z-score (HAZ), weight-for-age Z-score(WAZ) and weight-for-height Z-score (WHZ), were calculatedbased on the WHO growth standards and were usedto determine nutritional status among the children.Stunting, underweight and wasting were defined as beingless than 2 SD below the median value for HAZ, WAZ andWHZ, respectively.

## 4.6 Variable

### 4.6.1 Outcome Variable

Categorical variable Stunting: - Measuring length-for-age Z score (LAZ) if it is below - 2 SD (NCHS/WHO reference standard), Wasting: - Measuring Weight-for-length Z score (WHZ) if it is below - 2 SD (NCHS/WHO reference standard), and Underweight:- Measuring Weight-for-age Z score (WAZ) if it is below - 2 SD (NCHS/WHO reference standard)

### 4.6.2 Explanatory Variable

- Early initiation of breast-feeding was measured based on historic recall by all mothers who had children between 0-23 months of age.
- Exclusive breast feeding less than 6 months was measured based on Proportion of infants 0–5 months of age who are fed exclusively with breast milk.
- Continued breastfeeding at 1 year was measured Proportion of children 12–15 months of age who are fed breast milk.
- Introduction of complementary feeding was measured among infants between 6-8 months of age who were receiving solid, semi-solid or soft foods.
- Minimum dietary diversity was estimated by recall of food and liquid consumption during the previous day of the survey.
- A dietary diversity score was created by summing consumption of seven types of food groups: i) grains, roots, tubers; ii) legumes and nuts; iii) dairy products; iv) flesh foods

(meat, fish, poultry, organ); v) eggs; vii) vitamin A-rich fruits and vegetables, and viii) other fruits and vegetables. Thus the dietary diversity score ranges from 0-7 with minimum of 0 if none of the food group is consumed to seven if all the food groups are consumed. From the dietary diversity score, the minimum dietary diversity indicator was constructed using the WHO recommended cut-off point with a value of "1" if the child had consumed four or more groups of foods and "0" if less.

- Minimum acceptable diet: Proportion of children 6–23 months of age who receive a minimum acceptable diet (apart from breast milk).
- Consumption of iron-rich or iron-fortified foods: Proportion of children 6–23 months of age who receive an iron rich food or iron-fortified food that is specially designed for infants and young children, or that is fortified in the home.

### 4.6.3 Covariate

- Socio-demographic characteristic: - sex, age & current breastfeeding status of a child &height & BMI of mother.
- Environment :- urban vs rural residence

## 4.7 Data Analysis Procedures

Before data description and analysis the indictors was first generated using different variable in the child file. The indicators were created as follows:-

- Early initiation of breast-feeding were created using EDHS data using m34(when a child put to breast) variable which is measured based on historic recall by all mothers who had children between 0-23 months of age who breastfed a child with in one hour after birth.
- Exclusive breast feeding werecreated using v404(currently breastfeeding)constructed using a value of "1" if the childwere currently breastfeeding "0" if a child werenot currently breastfeeding &prelacteal feeding constructed using the with a value of "1" if the child is prelacteal feeding "0" if a child is not on prelacteal feeding. Therefore EBF weregenerated if a child werecurrently breastfeeding and not on prelactal feeding for those whose age is less than 6 months.
- Continued breastfeeding werecreated using m4 (duration of breastfeeding) variable which shows still breastfeeding, never breastfeeding & the like but I used still breastfeeding

indicators& measure Proportion of children 12–15 months of age who are still fed breast milk.

- Introduction of complementary feeding werecreated using m39a(did eat any solid,semisolid or soft food yesterday) variable to measure among infants between 6-8 months of age who were receiving solid, semi-solid or soft foods.
- A dietary diversity score was created by summing consumption of seven types of food groups: i) grains, roots, tubers; ii) legumes and nuts; iii) dairy products; iv) flesh foods (meat, fish, poultry, organ); v) eggs; vii) vitamin A-rich fruits and vegetables, and viii) other fruits and vegetables. Thus the dietary diversity score ranges from 0-7 with minimum of 0 if none of the food group is consumed to seven if all the food groups are consumed using around 14 variables. From the dietary diversity score, the minimum dietary diversity indicator was constructed using the WHO recommended cut-off point with a value of "1" if the child had consumed four or more groups of foods and "0" if less.
- Minimum acceptable diet werecreated using minimum meal frequency and minimum dietary diversity indicators for Proportion of children 6–23 months of age (apart from breast milk).
- Consumption of iron-rich or iron-fortified foods wereconstructed using Proportion of children 6–23 months of age who receive any iron rich food or iron-fortified food that is specially designed for infants and young children, or that is fortified in the home.

The power was adequate for each objective, but from all WHO core IYCF indicators only ISF & CBF variable were not used for the analysis because it was difficult to get there standard error, confidence interval and p value due to narrow age range of ISF which includes only age 6-8 months & CBF includes only age 12-15 months. Therefore it may give us a wide confidence interval (4).

Descriptive statistics using measure of central tendency and dispersion, frequencies, proportions and diagrams were used to check its distribution and describe the study population in relation to relevant variables. Cross tabulation was also performed to see the distribution of different variables in relation to outcome variable. Bivariate logistic regression analysis was used to assess the degree of association between dependent and independent variables and test significance of the association. Odds ratio with 95% confidence interval was used to measure strength of association. Those variables associated at bivariate logistic regression and those indicators which

are public health importance were entered into multivariate logistic regression model to identify the important determinants by controlling possible confounding effects. Regression models will use the ‘svy’ command in STATA to ensure that standard errors adjusted for the complex survey design. The STATA statistical software package version 11 (26) is used for all analyses.

## 4.8 Ethical Consideration

Ethical clearance is first obtained from the Research Ethical Committee of school of public health, Addis Ababa University. The analyses of this paper are confined to secondary data, approval to analyse the secondary data is requested from the CSA or ORC Macro (Demographic and Health Survey) and authorized to download data from the Demographic and Health Surveys (DHS) online archive (27).

## 4.9 Dissemination of Results

The final report of this study will be submitted to College of Health Sciences School of Public health. Effort will be made to disseminate through publication and presentation in scientific conferences. Therefore this information will be used for informed policy decisions, planning, monitoring, and evaluation of programs on health in general and child health in particular at both the national and regional levels.

# 5. Result

## 5.1. Sample characteristics:

The sample characteristics of the study population are described in Table 1. A total of 3826 mother child pairs were included in the analytic sample. The age distribution of the analytic sample shows that 29%children were under the age group of 16-23 months while 13% children were in the age group of 9-12 months, and gender was evenly split (51% male and 49% female).

According to the result of the study among the age group of 0-23 months29%, 21% & 14% of children were stunted, underweight and Wasted. With the mean HAZ, WAZ and WHZ score -1.01,-1.01 & -0.63 respectively.

The background characteristics of mothers indicated that 2,589 (68%) mothers were had no education and 76 (2%) had above secondary school. Most of the mothers 1,230 (32%) had a maternal height of 155-160 cm and few of them 94 (2%) had a maternal height of <145 cm. Among the mothers 203 (67%) of them had a normal BMI which was 18.5-24.99 $kg/m^2$. From all mothers majority of them have no prenatal visit which accounts for 2118(56%) and 616 (16%) of them had >3 prenatal visits.

Household characteristic of the study participants 3,326 (87%) are rural residents, 773 (20%) had used public tap water, 55 (1%) had Ventilated improved pit latrine (VIP) and 1,634 (43%) had no facility/bush/field. On the economic status of study participant 878 (23%) are poorest and 602 (16%) are richest.

**Table 1: sample characteristics (children 0-23 months of age) using EDHS 2011 in Ethiopia, 2016**

| Characteristics | % | No |
|---|---|---|
| **Child Age group** | | |
| <6 months | 26.6 | 1,020 |
| 6-8 months | 14.32 | 548 |
| 9-12 months | 12.53 | 479 |
| 12-15 moths | 16.86 | 645 |
| 16-23 months | 29.64 | 1,134 |
| **Child sex** | | |
| Male | 51.42 | 1967 |
| Female | 48.58 | 1858 |
| **Child(0-23 months)** | | |
| Stunted(HAZ<-2) | 28.88 | 1,105 |
| Underweight(WAZ<-2) | 21.35 | 817 |
| Wasted(WHZ<-2) | 14.02 | 536 |
| **Child(0-23months)** | | |
| Mean HAZ | -1.01 | |
| Mean WAZ | -1.01 | |
| Mean WHZ | -0.63 | |
| **HH characteristics** | | |
| urban | 13.07 | 500 |
| Rural | 86.93 | 3,326 |
| Public tap water | 20.22 | 773 |
| Ventilated Improved Pit latrine (VIP) | 1.44 | 55 |
| No facility/bush/field | 42.73 | 1,634 |
| **Wealth quintile** | | |
| Poorest | 22.96 | 878 |

| | | |
|---|---|---|
| Poorer | 22.19 | 848 |
| Middle | 21.41 | 819 |
| Richer | 17.7 | 677 |
| Richest | 15.74 | 602 |
| **Maternal characteristic** | | |
| **Maternal height(cm)** | | |
| <145 | 2.48 | 95 |
| >=145 | 97.52 | 3731 |
| **Maternal BMI** | | |
| <18.5kg/m2 | 27.25% | 994 |
| 18.5-24.99kg/m2 | 67.20% | 203 |
| >25kg/m2 | 5.55% | |
| Education | | |
| No education | 67.69 | 2,589 |
| Completed primary | 25.8 | 986 |
| Completed secondary | 4.53 | 173 |
| More than secondary | 1.98 | 76 |
| **Prenatal care use (m14)** | | |
| no prenatal visit | 56.15 | 2118 |
| 1-3 visits | 20.49 | 773 |
| >3 visits | 16.32 | 616 |

## 5.2. Nutritional status of children

Nationally, 28% of children under age two are stunted, In general, the prevalence of stunting increases as the age of a child increases, with the highest prevalence of malnutrition found in children age 16-23 months (49%) and lowest in children under age six months (9.4%). Male children are slightly more likely to be stunted than female children (32% and 26%, respectively).

The nutritional status of a child with mother who had BMI of <18.5 are more stunted, wasted and underweight (32.5%, 20.4% & 29% respectively) than those who had normal and above weight. The result also shows that maternal height has also a great impact on the nutritional status of the child those who had <145cm height are more stunted, wasted & underweight having (51%, 18% & 40% respectively). Maternal educational status has also impact on the nutritional status of the children as the level of education increases the tendency to have malnourished children decreases.

The study also shows children in the age group of 0-23 months who are living in rural areas had 30% of stuntingcompared to those who lives in urban 23%. The same is true for other nutritional outcomes. And families who have the lowest wealth status had high prevalence of stunting, wasting & underweight (34%, 17% & 27% respectively)than highest wealth quintile.

**Table 2: Percentage of children under two years classified as malnourished according to three anthropometric indices of nutritional status: height-for-age, weight-for-height, and weight-for-age, by background characteristics using 2011 EDHS in Ethiopia, 2016**

| | **Height-for-age** | **Weight-for-height** | **Weight-for-age** | | |
|---|---|---|---|---|---|
| **Background characteristics** | Percentage below -2 SD | Percentage below -2 SD | Percentage below -2 SD | Weight number of children | Unweight number of children |
| **Age in months** | | | | | |
| <6 | 9.4 | 12.76 | 8.8 | 1020 | 970 |
| 6-8 | 12.02 | 13.84 | 12.85 | 548 | 539 |
| 9-11 | 31.92 | 19. 97 | 29.84 | 479 | 410 |
| 12-15 | 36.39 | 16 | 27.64 | 645 | 624 |
| 16-23 | 48.98 | 11.58 | 29.59 | 1134 | 1,102 |
| **Sex** | | | | | |
| Male | 31.64 | 16.8 | 25.06 | 1967 | 1841 |
| Female | 25.95 | 11.06 | 17.43 | 1858 | 1804 |
| **Mothers nutritional status** | | | | | |
| Thin (BMI<18.5) | | 20.41 | 29 | 856 | 992 |
| Normal (BMI 18.5-24.9) | | 12.37 | 19.78 | 2807 | 2446 |
| Overweight (BMI>=25) | | 8.93 | 8.18 | 160 | 202 |
| **Mothers height** | | | | | |
| <145 cm | 50.78 | 18.1 | 39.88 | 95 | 82 |
| 145-149 cm | 37.23 | 20.03 | 29.58 | 411 | 371 |
| 150-154 cm | 36.49 | 14.28 | 24.41 | 1063 | 884 |
| 155-160 cm | 27.8 | 12.76 | 20.9 | 1230 | 1132 |
| >=160 cm | 16.94 | 12.47 | 13.73 | 1027 | 1176 |

| | | | | | |
|---|---|---|---|---|---|
| **Residence** | | | | | |
| Urban | 23.21 | 8.98 | 12.56 | 500 | 606 |
| Rural | 29.73 | 14.77 | 22.67 | 3326 | 3039 |
| **Mothers education** | | | | | |
| No education | 31.5 | 15.25 | 22.97 | 2590 | 2444 |
| Primary | 24.75 | 12.46 | 20.31 | 987 | 899 |
| Secondary | 19.45 | 6.74 | 10 | 173 | 205 |
| More than secondary | 14.64 | 8.58 | 5.71 | 76 | 97 |
| **Wealth quintile** | | | | | |
| Lowest | 34.35 | 16.89 | 26.98 | 878 | 1114 |
| Second | 31.27 | 18.48 | 26.34 | 849 | 669 |
| Middle | 30.44 | 12.36 | 21.73 | 819 | 626 |
| Fourth | 26.14 | 11.82 | 16.42 | 677 | 568 |
| Highest | 18.48 | 8.24 | 11.15 | 602 | 668 |

## 5.1. Breast feeding and complimentary feeding practice

Table 2 shows result of the WHO core IYCF practice. More than half of the mothers (51.1%) reported early initiation BF. Nearly half of the children (49.1) were exclusive breastfed. 270 (49.36%) of them are introduced to solid, semisolid or soft food for infants at the age of 6-8 months. Complementary feeding status of a child mainly MDD, MAD & IFD are poor among age 6-23 months having 3.24%, 2.97% & 5.68% respectively.

More female (54%) child was exclusively breastfed than male (45%) child;same is true for early initiation of breastfeeding. But for the other indicators it is almost same percent among male and female.

Overweight woman were better in breast feed and complimentary feeding practice than a normal BMI mothers (BMI 18.5-24.9cm). Height of mothers has nothing to do with breast feeding and complimentary feeding practice.

Rural residents were exclusively breast feed (50%) and continued breastfeeding(96%) more than urban residents (44% & 93% respectively) whereas urban residents are better in early initiation of breast feeding,. introduction of solid, semisolid or soft, minimum diet diversity, minimum meal frequency, minimum acceptable diet and consumption of iron rich or iron fortified food than rural residents.

Except EBF & CBF which accounts 50% & 96% respectively, the other indicators were low in those who had no education. Same is true for high and low wealth quintile of families on the practiceof IYCF.

**Table 3: Infant and young child feeding (IYCF) practices Percentage of youngest children age 0-23 months living with their mother who are fed according to three IYCF feeding practices during the day or night preceding the survey, by background characteristics using 2011 EDHS in Ethiopia, 2016**

| Background characteristics | Exclusive breastfeeding | Early initiation of BF | Continued BF | Introduction of solid, semisolid or soft foods | Minimum diet diversity | Minimum meal frequency | Minimum acceptable diet | Consumption of iron rich or iron fortified food |
|---|---|---|---|---|---|---|---|---|
| **Age in months** | | | | | | | | |
| <6 | | | | | | | | |
| 6-8 | 49.01 | 47.02 | 98.71 | 12.05 | 0.92 | 0 | 0 | 0.02 |
| 9-11 | 15.61 | 56.92 | 98.8 | 49.36 | 1.09 | 36.79 | 1.09 | 3.11 |
| 12-15 | 3.75 | 53.42 | 95.96 | 74.67 | 1.6 | 38.52 | 1.6 | 2.52 |
| 16-23 | 1.95 | 52.62 | 95.92 | 82.87 | 4.79 | 45.28 | 4.33 | 6.02 |
| | 3.25 | 50.21 | 82.43 | 90.35 | 4.1 | 58.68 | 3.69 | 8.06 |
| **Sex** | | | | | | | | |
| Male | 44.95 | 48.78 | 96.34 | 51.17 | 3.28 | 48.68 | 2.98 | 5.77 |
| Female | 53.54 | 53.65 | 95.51 | 47.63 | 3.21 | 47.06 | 2.96 | 5.59 |
| **Mothers nutritional status** | | | | | | | | |
| Thin (BMI<18.5) | 50.45 | 52.16 | 97.97 | 48.02 | 1.53 | 45.1 | 0.83 | 7.65 |
| Normal (BMI 18.5-24.9) | 48.3 | 50.4 | 95.45 | 49.21 | 3.48 | 48.64 | 3.41 | 5.1 |
| Overweight (BMI>=25) | 57.27 | 57.9 | 90.65 | 57.09 | 10.07 | 51.87 | 8.78 | 3.82 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Mothers height** | | | | | | | | |
| <145 cm | 42.22 | 46.94 | 99.55 | 45.42 | 1.04 | 44.92 | 1.04 | 5.08 |
| 145-149 cm | 51.52 | 47.18 | 92.33 | 45.58 | 3.91 | 43.62 | 3.34 | 9.1 |
| 150-154 cm | 44.75 | 51.49 | 95.86 | 45.8 | 3.42 | 45.27 | 2.93 | 4.4 |
| 155-160 cm | 50.97 | 49.9 | 97.95 | 53.26 | 3.32 | 50.1 | 3.17 | 6.79 |
| >=160 cm | 49.97 | 54.21 | 94.6 | 49.27 | 2.93 | 50 | 2.83 | 4.49 |
| **Residence** | | | | | | | | |
| Urban | 43.98 | 55.13 | 93.18 | 61 | 8.71 | 52.01 | 7.69 | 8.55 |
| Rural | 49.7 | 50.54 | 96.4 | 47.56 | 2.4 | 47.24 | 2.24 | 5.24 |
| **Mothers education** | | | | | | | | |
| No education | 49.87 | 50.11 | 96.17 | 41.68 | 1.45 | 43.63 | 1.29 | 5.14 |
| Primary | 48.25 | 51.43 | 95.75 | 65.53 | 5.68 | 55.77 | 5.57 | 6.85 |
| Secondary | 44.25 | 60.83 | 93.67 | 69.63 | 10.68 | 57.86 | 8.49 | 7.75 |
| More than secondary | 45.88 | 60.22 | 93.47 | 88.47 | 18.12 | 71.17 | 15.8 | 5.66 |
| **Wealth quintile** | | | | | | | | |
| Lowest | 47.1 | 47.04 | 95.75 | 42.41 | 0.91 | 41.39 | 0.9 | 3.7 |
| Second | 45.39 | 50.58 | 96.72 | 50.27 | 3.17 | 47.81 | 2.73 | 3.91 |
| Middle | 58.96 | 51.96 | 98.57 | 48.41 | 1.42 | 49.84 | 1.41 | 6.97 |
| Fourth | 50.17 | 50.03 | 93.73 | 49.48 | 2.57 | 49.74 | 2.39 | 7.21 |
| Highest | 40.36 | 57.76 | 94.46 | 58.76 | 9.96 | 52.94 | 9.11 | 7.73 |

## 5.1. WHO IYCF indicators and nutritional status of a child

### 5.1.1. Association between WHO IYCF indicators and Stunting

Exclusive breast feeding with COR= 0.97, 95%CI: 0.5-1.87, Early initiation of breast feeding with COR= 0.82,95%CI: 0.66-1.03, Minimum diet diversity with COR=0.55, 95%CI: 0.27-1.1, Minimum acceptable diet with COR=0.46, 95%CI: 0.2-0.99 these WHO IYCF indicators are negatively associated with stunting from all only MAD was significantly associated.But the following two WHO IYCF indicators Minimum meal frequency with COR =1.32, 95%CI: 1.05-1.66which is significantly positively associated and Consumption of iron rich or iron fortified food with COR=1.2, 95%CI: 0.788-1.84 were positively associated with stunting.

### 5.1.2. Association between WHO IYCF indicators and Wasting

All WHO IYCF indicators, Exclusive breast feeding with COR=0.79(0.45-1.40), Early initiation of breast feeding with COR=0.85(0.64-1.13), Minimum diet diversity with COR=0.47(0.15-1.42), Minimum meal frequency with COR=0.64(0.47-0.88), Consumption of iron rich or iron fortified food with COR=0.58(0.27-1.2) were negatively associated with wasting. But only MMF was significantly associated.

### 5.1.3. Association between WHO IYCF indicators and Underweight

Exclusive breast feeding with COR=0.76(0.42-1.39), Early initiation of breast feeding with COR=0.81(0.63-1.03), Minimum diet diversity with COR=0.31(0.12-0.80), Minimum acceptable diet with COR=0.85(0.45-1.6) and Consumption of iron rich or iron fortified food with COR=0.85(0.45-1.61) were negatively associated with Underweight but from all only MDD & MAD were significantly associated.But Minimum meal frequency with COR=1.03(0.82-1.29) were positively associated with underweight which was not significant.

Table 4:-Bivariate logistic regression results for the association of each of the eight cores WHO IYCF indicators with stunting, wasting and underweight using 2011 EDHS in Ethiopia, 2016

| WHO indicators | Stunting COR(95%CI) | frequency | Wasting COR(95%CI) | frequency | Underweight COR(95%CI) | frequency |
|---|---|---|---|---|---|---|
| **Exclusive breast feeding** | 0.97(0.5-1.87) | 46 | 0.79(0.45-1.40) | 57 | 0.76(0.42-1.39) | 39 |
| **Early initiation of breast feeding** | 0.82(0.66-1.03) | 522 | 0.85(0.64-1.13) | 254 | 0.81(0.63-1.03) | 380 |
| **Minimum diet diversity** | 0.55(0.27-1.1) | 22 | 0.47(0.15-1.42) | 7 | 0.31(0.12-0.80) | 9 |
| **Minimum meal frequency** | 1.32(1.05-1.66) | 492 | 0.64(0.47-0.88) | 150 | 1.03(0.82-1.29) | 333 |
| **Minimum acceptable diet** | 0.46(0.2-0.99) | 17 | 0.52(0.17-1.57) | 7 | 0.85(0.45-1.6) | 9 |
| **Iron fortified or iron rich food** | 1.2(0.788-1.84) | 64 | 0.58(0.27-1.2) | 15 | 0.85(0.45-1.61) | 37 |

Table 5 shows the result of the multivariate regression that evaluated the association between the eight WHO IYCF indicators and anthropometric outcomes such as stunting, wasting and underweight. After adjusting for potential confounders such as sex and age of a baby, height, BMI of a mother & being urban and rural residences.

After adjusting for possible confounders minimum acceptable diet& minimum diet diversity was found to be significantly associated with stunting with a p-value of 0.026, 0.05and with [AOR=0.41, 95%CI: 0.18, 0.89 & [AOR=0.48, 95%CI: 0.239, 1].When we see wasting only minimum meal frequency was found to be significantly associated with a p-value of 0.03 and [AOR 0.7, 95%CI: 0.15, 0.96].

**Table 5: multivariate logistic regression results for the association of each of the cores WHO IYCF indicators with stunting, wasting and underweight using 2011 EDHS in Ethiopia, 2016**

| | Stunting | Frequency | wasting | Frequency | Underweight | Frequency |
|---|---|---|---|---|---|---|
| **EBF** | 1.15(0.69-1.92) | 46 | 0.87(0.52-1.43) | 57 | 1(0.65-1.53) | 39 |
| **EIB** | 0.81(0.64-1.03) | 522 | 0.86(0.64-1.14) | 254 | 0.8(0.16-1.03) | 380 |
| **1MDD** | A | 33 | 0.57(0.18-1.81) | 7 | 0.33(0.12-0.87) | 9 |
| **MMF** | 1.05(0.81-1.36) | 492 | 0.70(0.51-0.96) | 150 | 0.97(0.75-1.26) | 333 |
| **MAD** | 0.39(0.18-0.84) | 17 | 0.67(0.22-2.06) | 7 | 0.36(0.13-0.98) | 9 |
| **IFF** | 1.01(0.65-1.57) | 64 | 0.57(0.26-1.24) | 15 | 0.78(0.38-1.60) | 37 |

## 6. Discussion

According to the result of the study among the age group of 0-23 months29%, 21% & 14% of children were stunted, underweight and wasted. Comparing Maternal characteristics and child nutritional status, it shows exclusive breast feeding decreases as the age of the child increases whereas early initiation of breast feeding for children who were born below 6 month on wards of the study period was very low 47% , compared to children who were 6 months and above during the study period. Females are exclusively breast feed and early initiated to breast feeding than males but males are continuing breast feed than females. Male children are slightly more likely to be stunted than female children, similar finding inEthiopia (5). This might opposite to the gender preference or preferential feeding practices because female infants usually receive less food than male infants (28, 29).Wells (30) suggests that despite the improvement in medical care, environmental stresses have harsher effects on males than females in early life.

The study indicates as the BMI of the mothers increases continued breast feeding and consumption of iron rich or iron fortified food decreases but introduction of solid, semisolid or soft foods, minimum diet diversity, minimum meal frequency and minimum acceptable diet increases as the BMI of the mother's increases. Rural residents were exclusively breast feed and continued breast feeding more than urban residents whereas urban residents are better in early initiation of breast feeding than rural residents. In case of introduction of solid, semisolid or soft, minimum diet diversity, minimum meal frequency, minimum acceptable diet and consumption of iron rich or iron fortified food urban residents are better than rural residents.

The IYCF practices are particularly poor except continued breast-feeding at 12-15 months which is similar finding research done in Zambia, Ethiopia &India (5, 15). The results suggest that poor complementary feeding practices, in particular, minimum diet diversity and minimum meal frequency are strongly associated with poor nutritional outcomes, especially higher prevalence of stunting and underweight same is true for Bangladesh & India (14, 15) Other complementary feeding practices that are associated with better nutrition outcomes are minimum meal frequency.

Therefore, these is evidence to suggest that the IYCF practices measured by the WHO indicators, especially the CF practices related to the overall quality of child diets, should demonstrate associations with the growth of young children. The WHO IYCFindicators though were designed as simple indicators that could be incorporated into large-scale surveys (4). these indicators are especially well suited for monitoring trends in diet quality in large-scale data sets wherein

detailed dietary data cannot be collected; however, they may not be highly sensitive or specific measures of dietary quality in the analysis of the causal pathways to child growth (15). Although the relevance of these indicators does not depend in all cases on how well they are associated with child anthropometry at the individual level, understanding these associations is essential for selecting appropriate metrics for different purposes. We examine in more depth below the design of the individual indicators and their association with anthropometric outcomes.

Negative association was seen between IBF, MDD, MAD and stunting but the observed negative association was only significant for MDD & MAD indicators. Other researches done in Zambia Bangladesh and India also shows similar negative association with ($P<0.05$) (5, 14, 15). Another similar study done by using EDHS 2005 also showed similar finding ($P <0.05$) (5). The observed association between MDD and stunting can be explained by the fact that infant has been fed from at least 4 different food groups. And this diversity in food group helps the child to be provided with different nutrients need for good nutritional outcome.

The observed association between MAD and stunting could be explained by the fact that MAD is composite indicator of MDD & MMF, so it is possible to find the observed association. Even though stunting is positively associated with EBF, MMF & IFF it was not statistically significant. Similarly the association between exclusive breast feeding and HAZ were negative in 7 other countries, however, this association was significant only in Ethiopia using 2005 EDHS (5) and Kenya ($P<0.01$ and $P<0.050$ respectively) (6). The observed positive and lack of association between EBF prevalence and stunting might be explained by inaccuracy of the indicator used to assess EBF practice. This inaccuracy might lead to misclassification of an infant as being exclusively breast fed (6).

The observed positive association between MMF and stunting might be explained by as the feeding frequency increases the chance of the child being breast fed decreases. And breast feeding is essential for linear growth of a child (1).

In this study all breast feeding and complimentary feeding indicators were negativelyassociated with wasting but it was significant only in MMF. The MMF indicator, intended as a proxy for dietaryenergy intake, was also positively associated withWHZ in Uganda, but was not strongly associated with any other anthropometric outcome (6). The cut offs as defined by the MMF indicator, therefore, would tend to underestimate the number of children fed complementary

foods of low energy density. On the other hand, a high number of daily feedings of complementary foodsmay excessively displace breast milk and deleteriously affect child growth. Capturing these complex dynamics in a single indicator, amenable to largescale surveys may not be feasible and may contribute to the lack of association observed between the MMF indicator and child anthropometry. As in the above section since MMF was not protective against stunting even if it is not significant, but significantly associated with wasting. This might also explained by since height is in the numerator and denominator of the two metrics, stunting & wasting respectively, child linear growth spurts may lead to decrease in height-for-age with simultaneous increase in weight-for-height (6).

There is an observed negative association of underweight and complementary feeding but this negative association was significant only for MDD and MAD. Coming to the indicator of breast feeding we find association between early initiation of breast feeding and underweight but the association was not statistically significant. On the other hand exclusive breast feeding was not associated with underweight.

**Strength and limitations of the study**

The cross-sectional nature of the data limits analyses to exploring associations rather than determining causality. Longitudinal data would be better for this type of study. However, the study addresses limitation through inclusion of a variety of variables to control for confounding. The inclusion and exclusion criteria may under or overestimate our objective.However, the use of nationally representative data lends strength and credibility to our analyses.

## 7. Conclusion and recommendation

Child under nutrition was prevalent in Ethiopia. Practices related to complementary feeding (minimum diet diversity and minimum acceptable diet) were associated with stunting and underweight. And minimum meal frequency was associated with wasting. Finding formexclusive breast feeding was not significantly associated with any of anthropometric indices except showing no association with underweight.

Our findings have significant implications for public health practice, both in programme design and evaluation and for future research. We conclude that strategies to improve IYCF practices, and particularly to increase exclusive breast-feeding and improve the diversity of complementary foods fed to infants, should be a high priority in programmes that aim to address undernutrition among infants and young children in this region.Further research on assessing the accuracy of WHO IYCF indicators needs be conducted.

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## 9. ANNEX

Addis Ababa University

School of public health

### Annex 1: Subject Information Sheet

My name is MastewalDemiss student of Addis Ababa University School of public health. I am conducting a research on World Health Organization core Infant and Young Child Feeding indicators predict child undernutrition in Ethiopiausing 2011 EDHS. I received permission from Addis Ababa university school of public health.

The study could also help to see the real practice among caregivers in order to institute appropriate intervention and strategies can be developed and provide base line data for policy makers, health care providers, and concerned bodies for further improvements of child feeding. In addition, these indicator outcomes are needed to develop an understanding of the strengths and potential limitations of the indicators when used for different purposes. No one will have access to the data except the principal investigator and the data will not be used for purposes other than the study. Your willingness is very important for the success of this study.

Address: Cell phone +251 (0) 913368401

Email: mastisha21@gmail.com

Annex 2: Curriculum Vitae

**Telephone: Cell Phone: + 251 913 36 84 01**

**PO Box: 55178 Addis Ababa, Ethiopia**

**Email:** mastisha21@gmail.com

## Personal Data

Date of Birth : July 28, 1989

Sex : Female

Marital Status : Single

Nationality : Ethiopian

## Career Objective

To find a position where I can develop my professional skills further and be an effective on the health sector.

## Summary of Qualification

I have completed a Bachelor Degree of Public Health Officer and I have four year experience in working in health centre working at emergency OPD, have experience in minor surgical skillandworking as curative sub processer for one year. And now I am attending Masters in Public health nutrition at Addis Ababa University College of Health Sciences School of Public Health.

## Education

Elementary School St. Raguale School

High School Cathedral (Nativity Girls School)

Higher Education BSc, Public Health Officer

DebreBerhan University, Ethiopia

Nowattending Mph, public Health Nutrition

AddisAbaba University.

## Professional Experience

| | |
|---|---|
| 4/2011 – 10/2015 | OPD, Focal person STI, Minor surgery (Circumcision) and curative sub processer |
| | SelamHealth Centre |
| | Organization Type: Governmental. |
| 4/09/-20/10/2013 | Marie Stops Ethiopia |
| | Organization Type: NGO |

## Trainings

1. Syndromic Management of sexual transmitted infection training
2. Leadership & Management skills development Training program.
3. Improving paediatric care with medical software.
4. Certificate of Ambassador for peace.
5. TOT on Integrated Emergency medicine.
6. TOT on Syndromic management of sexually transmitted infection.
7. Management of burn.

## Language

| | **Oral Level** | **Written Level** |
|---|---|---|
| ▪ Amharic (Ethiopian ) | Advance(Fluent) | Advance (Fluent) |
| ▪ English | V. good | V. good |

## Reference

1. Addis AbebaTena Bureau + 251115 51 99 86

2. Selam Health Center + 251 11 2 59 38 99

3. Dr Mohammed Gemchu + 2519 11 40 81 72

4. Sr. SenaitDegnate + 2519 11 68 68 39

## Annex 3: Assurance of principal investigator

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

Name of the student: _____

Date: _____ Signature _____

**Approval of the primary Advisor**

Name of the primary advisor: _____

Date._____ Signature _____