ADDIS ABABA UNIVERSITY COLLEGE OF NATURAL SCIENCE

CENTER FOR FOOD SCIENCE AND NUTRITION

FACTORS ASSOCIATED WITH LENGTH OF INFANTS IN SELECTED GOVERNMENTAL HEALTH CENTERS IN ADDIS ABABA

BY: MEKDES AKLILU (BSc)

ADVISOR: DR.KALEAB BAYE (PhD)

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Factors Associated with Length of infants in selected governmental health facilities in Addis Ababa.

BY

Mekdes Aklilu (BSc)

Approved by the examining board **Signature**

Chairman, Department Graduate Committee

_____ _____

Advisor;
Kaleab Baye (PhD) _____

Examiners

Dr. Dawud Gashu _____

Dr. Awoke Kebede _____

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ACRONYMS

AAU- Addis Ababa University

AARHB-Addis Ababa Regional Health Bureau

AOR- Adjusted Odds Ratio

ANC-Antenatal care

COR-Crude odds ratio

CSA-Central statistics agency

ETB- Ethiopian Birr

EDHS-Ethiopian Demographic and Health Survey

HAZ-Height -for-age Z-score

HGB-Hemoglobin

IYCF- Infant and Young Child Feeding

MUAC-Mid-upper arm circumference

NGO-Non-Governmental Organization

NNP-National nutrition programme

PNC-Postnatal care

REC-Research ethics committee

SGA-Small for gestational age

UNICEF- United Nations Children's Fund

WHO- World health organization

WDDS-Women dietary diversity score

ABSTRACT

Background: Measurement of length at birth, or in the neonatal period, is challenging and not validated. But linear growth retardation often begins inutero, and continues through the first 1,000 days of life.

Objectives: To determine length at birth and identify associated factors among live borne babies at selected health facility in Bole and Kirkos sub city, Addis Ababa, Ethiopia, 2017.

Methods: A facility-based prospective cohort study was conducted in four health centers in Addis Ababa from January to April, 2017. A total of 204 pregnant women who were at their third trimester (≥32 weeks of gestation) and their new born babies were included in the study. A pre-tested, structured, interviewer administered questionnaire consisting of Women's Dietary Diversity Scores (WDDS) was used. Mothers' anthropometric measurement, and infants' supine birth length was measured. Length-for-age Z-scores (HAZ) were calculated and were compared with the WHO growth standard.

Results: From 185 children that completed the study, 13.5% of new born babies were stunted (HAZ< -2SD). Maternal MUAC (AOR=.039; 95%CI.008-.198), maternal weight gain during pregnancy (AOR= .233; 95% CI .058-.944), birth weight (AOR= .132; 95%CI .026-.656) and sex of the infants (AOR= .152; 95%CI .035-.656) were significantly associated with HAZ <-2 Z-score ($p < 0.05$).

Conclusion and recommendation: linear growth failure in this setting begins in utero, suggesting that stunting prevention that starts during or even before pregnancy is required**.**

CHAPTER-ONE

1. INTRODUTION

1.1 BACKGROUND

Children constitute the most vulnerable segment of any community. Their nutritional status is a sensitive indicator of community health and nutrition. Globally, it is estimated that under nutrition is responsible, directly or indirectly, for at least 45% of deaths in children less than five years of age [WHO, 2010].Under nutrition is also a major cause of disability preventing children who survive from reaching their full development potential[WHO, 2010]. Stunting (deficit in height for age Z- score) affects close to 165 million children under five years of age in the world and 56%in Africa [WHO, 2011]. The height/length-for-age index provides an indicator of linear growth retardation and cumulative growth deficits in children. Children whose height-for-age Z-score is below minus two standard deviations (<−2 SD) from the median of the WHO reference population are considered short for their age (stunted), or chronically malnourished [WHO, 2010].

Stunting reflects failure to receive adequate nutrition over a long period of time and is affected by recurrent and chronic illness. Although stunting was reported to reach a pick during the complementary feeding period, a significant proportion of children are already stunted at birth [WHO, 2010]. For example, in India, the National Family Health Survey 2005–2006 showed that stunting at birth reaches 20%, indicating that the process of growth failure started prenatally [RaoVG et al. 2005]. Similarly, in Malawi about20% of the 10-cm deficit in height at 3years of age was found to be already present at birth [RaoVG et al. 2005]. In Indonesia for example, newborn length was found to be a stronger than any other determinant in predicting length-for-age at 12 months [Schmidt M.K et al. 2002].

More recently, using the WHO Child Growth Standards, a study that examined the timing of growth faltering in under-5years of age in India, based on nationally representative data, concluded that about half (44% to 55% depending on the survey year) of growth faltering was already present at birth [Mamidi R.S et al. 2011]. After birth, the average length-for-age z-score among infants in deprived populations continues to decline until around 24months of age. This

sustained growth faltering is observed everywhere, although its magnitude varies by region. This timing is not surprising as healthy infants experience maximal growth velocity during the first few months of life [de Onis M et al.2011]. Emphasis on the first 1000days is thus based not only on the magnitude of faltering but also on its long-term impact on adult human capital [VictoraC et al.2008]. Despite clearly documented intergenerational effects, it would seem that nearly normal lengths can be achieved in children born to mothers who themselves were not malnourished in childhood, when profound improvements in health, nutrition and the environment take place before they conceive. In other words, in developing countries, trans-generational improvements in height are achievable faster than expected if women of reproductive age have adequate health and nutrition, and access to health care [VictoraC et al.2008].

Most of the national survey statistics for stunting cover the 6–59 months age group, the linear growth situation for the earliest period of the lifespan, back to the time of birth, is covered with some uncertainty [WHO, 2006]. One reason is that technical issues with the measurement procedure and even reluctance to manipulate the newborn into an extended posture are barriers for reporting length data at birth. But linear growth retardation often begins in utero, especially the first 1,000 days of life beginning with conception, through a mother's pregnancy and up until the age of two is the most critical period in a child's development [VictoraC et al.2008].A study done in different countries, show that maternal under nutrition is estimated to account for 20% of childhood stunting [WHO, 2006].Thus, improving the dietary pattern and nutritional status both before and during pregnancy can play a major role in preventing linear growth retardation and the associated short- and long-term adverse effects [WHO, 2006]. This is in line with the current emphasis on the first 1000 days of life as a window of opportunity to promote healthy child growth [1000 Days Partnership, 2011].

A number of studies have looked more closely breastfeeding and complementary feeding period and its association with child growth faltering. However, there is little information on factors affecting length at birth, and we were not able to identify any study conducted in Ethiopia. Instead, birth weight has remained the variable of interest in clinical medicine and public health nutrition. This is unfortunate as such data will help to give emphasis on advancing measurement methodology and to design interventions that will prevent stunting from birth.

1.2 STATEMENT OF THE PROBLEM

In Ethiopia chronic malnutrition in children is continued to be one of the most important public health problem. In recent years, Ethiopia has witnessed success in reducing the prevalence of stunting with annual reduction rate of 1.3% which reduced the prevalence of stunting from 44% in 2011to 40% in mini EDHS 2014 and to 38% in 2016 [EDHS 2011,2014 and 2016].Even if the rates of Addis Ababa was small compared to other regions, there are differences in morbidity, maternal care giving behaviors during pregnancy, and dietary factors among others warrants a population-specific approach when studying the determinant factors for malnutrition. In other way, the combination of birth length and weight may predict potential risk of overweight at birth. As cities in most African countries are witnessing a rise in overweight, this information is crucial for rapidly growing cities like Addis Ababa.

1.3. OBJECTIVES

1.3.1. General Objectives

- To determine length at birth and identify associated factors among live borne babies in selected health centers in Bole and Kirkos sub-city, Addis Ababa, Ethiopia, 2017.

1.3.2. Specific Objectives

- To determine length at birth among live borne babies in selected health centers, Addis Ababa, Ethiopia.
- To identify factors associated with birth length among live borne babies in selected health centers, Addis Ababa, Ethiopia.

CHAPTER-TWO

2. LITERATURE REVIEW

2.1 Measuring size at birth

Size at birth is an important predictor of health and therefore should be measured as accurately as possible for planning and implementation of infant care accordingly. Accurate and reliable monitoring of infant size is especially important for infants at risk for inadequate growth or other health conditions. Size is estimated also during pregnancy to possibly detect possible abnormalities in growth, but exact measurements can be obtained just after birth. There are several anthropometric measurements used to evaluate newborn size at birth; birth weight, birth length, head circumference, chest circumference, mid-upper arm circumference (MUAC) and abdominal circumference. Of the above-mentioned, birth weight, length and head circumference are most commonly used globally [WHO, 2011].

2.1.1 Birth length

Data on birth length are available only from few countries, since it is not measured or recorded in many countries. In the United States new intrauterine curves for size at birth were published in 2010 based on data on 391,681 infants in years 1998 to 2006 [Olsen et al.2011]. According to the data the mean birth length of infants born at term (37 to 41 weeks) was 49.9 cm for girls and 50.6 cm for boys. In India mean length of boys at 38 weeks was 49.1 cm for boys and 48.6 cm for girls [Kandraju, et al.2012].

2.2Factors associated with length at birth

Many different factors affect infant size at birth. These factors can be related to the infant, mother or the environment where mother and fetus live. Understanding which factors affect size at birth is important, since it may provide us possibilities to impact these factors and thus improve size at birth to optimal. Factors affecting growth in fetal period may be genetic or environmental, but distinguishing these two is very difficult. It seems that genetics has the largest effect on size at birth, but also Swedish study in 2012 on Intergenerational correlations in size at birth and the contribution of environmental factors on environmental modifiable factors correlate significantly with newborn size [De Stavola et al. 2011].

2.2.1 Women's anthropometry measurements

In the last decade, an association of maternal anthropometry (height, weight or thinness) and birth length has been stressed [World Bank. 2010]. Maternal stunting (height<145cm) increases the risk of both term and preterm small for gestational age (SGA) babies [World Bank. 2011]. Pooled analysis of 7630 mother child pairs from birth cohorts of five countries, Brazil, Guatemala, India, Philippines and South Africa, reveals that maternal height is associated with birth weight and with linear growth over the growing period. Short mothers (<150cm) are reported to be three times more likely to have a child who is stunted at 2years of age and as an adult[AddoO.Y. et al. 2013]. An analysis of national demographic survey findings from India reveal a significant decrease in relative risk of stunting in children for every 5cm increase in maternal height from <145 to >160cm [Subramanian S.V.et al.2009]. This study also reports that the effect size of short maternal height is twice that of being in the lowest education category and 1.5times that of being in the poorest quintile. The significance of women being provided appropriate and timely inputs for attaining optimum adult height is evident [Ozaltin E,et al. 2010]. In addition, short maternal stature of the mothers is of concern. A high prevalence of adult stunting was documented in a survey on mothers in Guatemala. The mean height of the 542 mothers in that study was 149·2 (SD 5·9) cm, with 59 % standing less than150·3 cm tall. As pelvic dimensions are directly associated with maternal height, stunted mothers are at risk of obstetric complications during delivery also higher chance of giving stunted babies [Stephens, et al.2006].

A recent prospective study from Vietnam concludes maternal pre-pregnancy weight was to be the strongest indicator predicting infant birth size [Young F.M., et al. 2015].Women with pre-pregnancy weight less than 43kg or who gained <8kg during pregnancy are reported to be more likely to give birth to a SGA or LBW infant. There is evidence that supports the fact that stunting begins in utero and newborn size is a strong predictor of achievement of height at 12 months of age [WHO, 2006].

2.2.2 Small for gestational age and intrauterine growth restriction

The term small for gestational age (SGA) is used for newborns with estimated weight, length or weight and length being less than -2SD for gestational age [Olsen et al.2011].Symmetric growth failure is defined as both length and weight being abnormal and asymmetric when

weight is less than –2SDs and length is normal. Also size being less than 10th percentile in growth curves is used to classify child as SGA [Olsen et al.2011].The use of SDs or percentiles in defining SGA requires accurate estimation on the gestational age and may be unfeasible in many developing countries due to lack of contemporary obstetrics resources. As a result, these SGA infants were had high tendency of being stunted. SGA children may be preterm, term or post-term and also etiology of growth restriction differs. For example, children who are well nourished and healthy, but grow according to their genetic potential to be smaller than most of the newborns. Second, children who are SGA because of chromosome disorders or infections during prenatal period and finally children whose growth has decelerated due to placental malfunction [Dunkel L. et.al. 2010].

2.2.3 Direct nutrition-specific factors

2.2.3.1 Energy imbalance, poor food diversity and stunting

Poor dietary intake during pregnancy is a significant contributor to global maternal malnutrition in less developed countries [Black, et al.2008]. A previous review indicated that pregnant women in developing countries suffer from energy deficiencies due to relatively insufficient energy intake [Macro International Inc. 2008]. Dietary intake of women in South Asia is observed to lack energy and diversity not only during pregnancy but also prior to pregnancy. Rural India data reveal that consumption of mean energy and protein is almost identical in pregnant (1773cal and 49g protein) and adult non-pregnant women (1709cal and 47g). Only 61% of pregnant women report consuming over 70% of the recommended dietary allowances (RDA) of energy, while only 30% consume over 70% RDA of protein. No increase in intake of iron, vitamin A and calcium is observed during pregnancy with less than 10% consuming >70% RDA of iron and calcium, while only 13% are reported to be consuming >70% RDA of vitamin A [NNMB Third Repeat Survey 2012]. Poor dietary diversity during pregnancy has been identified as an important factor that needs to be addressed for reducing prevalence rate of stunting. Besides dietary intake, excessive energy expenditure due to heavy workload adversely influences pre pregnancy weight, BMI of women and gestational weight gain during pregnancy are important factors [NNMB Third Repeat Survey, 2012].

2.2.3.2 Micronutrient deficiencies, anemia and stunting

Requirements for micronutrients increase substantially during pregnancy, and maternal micronutrient deficiencies of iron and iodine are reported to be associated with adverse birth outcome, including LBW [Zimmerman M.B. 2012].Maternal iron deficiency anemia prior to and early pregnancy places the mother at increased risk of significant decrements in fetal growth (growth restriction), preterm birth or LBW delivery. The primary reason for the high prevalence rate of anemia is poor intake of dietary iron, low availability of iron from cereal-based diet and poor consumption of animal foods or haem [WHO,2009].

2.2.4 Demographic and socio-economic factors

Socioeconomic factors, such as family income, parental education, occupation and access to health care and other resources are associated with human health and wellbeing and affect also birth outcome. These social determinants may be individual or area based, but the outcome to infant's size is similar [Weightman et al. 2012]. Average size of birth is smaller and SGA more prevalent in developing countries compared with economically better off countries [Weightman et al. 2012].When studying the trends of size at birth in Russia, U-shaped curve was seen in birth weight and length, values being lowest in 1990's when economic transition was starting [Mironov B.2007].

Marital status of the mother: Study in Nairobi Kenya, suggested that, the odds of stunting for children born to mothers who were never married are 56 % higher relative to those who are currently in union [Zimmerman M.B.2012]. In DRC there were no statistically significant association observed between the prevalence of stunting and mother's marital status [Zimmerman M.B.2012].

Education status of mother: According to the EDHS 2011 survey, children of mothers with more than secondary education are the least likely to be stunted (19 %), while children whose mothers have no education are the most likely to be stunted (47 %) [EDHS, 2011].

Educational status of father: In Ethiopia study showed the likelihood of being stunted was also 1.4 times higher among children of father who has no education compared with children whose father has some secondary or higher education [Macro International Inc. 2008].

Household economic status: Most study confirmed that there were linearly associated between stunting and economic status. Studies in India [World Bank, 2010] and Nepal [World Bank, 2010] concluded that household economic status was a risk factor for stunting. In Ethiopia studies also indicated, as compared with children from medium or higher economic status households, children of poor households were 1.9 times more likely to be stunted [Macro International Inc. 2008].

2.2.5 Genetics

Both fetal and maternal genes may affect size at birth. There is a complex interaction between Parental, fetal genetic and environmental factors. Genes passed from both mother and father to the fetus influence fetal growth and size at birth [Yaghootkar et. al.2012]. Maternal genes have also indirect effect to size at birth through intrauterine environment and external environment acts via intrauterine environment and genes to size of birth. Maternal genes contribute to infants' size at birth through intrauterine environment even though child is biological to the mother [Rice F.2010]. Fathers have also been shown to influence size at birth of their children but the effect is fairly small and maternal characteristics and intrauterine environment may inhibit largely this association [Rice F.2010]. Also intergenerational studies have been used in estimating heritability of fetal growth and size of birth estimated that both fetal and maternal genes explain 53 percent of the variation in birth weight, 50 percent in birth length and 46 percent in head circumference, the effect of fetal genetic factors being larger than maternal genetic factors [Lunde et al .2007].

2.2.6 Environmental factors

2.2.6.1 Smoking

Study in Finland showed, about 15% of pregnant women smoke during pregnancy, tobacco contains thousands of hazardous chemicals, of which many penetrate through placenta to the fetus increasing infant growth-restriction, morbidity and mortality. The exact mechanism behind the effects of smoking to fetus has not been proven, but it is suggested to consist of multiple different factors. For example nicotine and carbon monoxide in tobacco deteriorates uterus and placental blood flow causing decreased oxygen uptake by fetus. Fetus exposure to tobacco impairs fetal growth and may also shorten gestational length, causing preterm births [Lunde et al .2007].

2.2.7 Health care factors

Weight and height of the mother: Maternal weight and height are associated to infant's size at birth. Often measured maternal anthropometric indices include pre-pregnancy weight, height, MUAC and weight gain during pregnancy. Correlation between maternal shoe size and infant's birth size has also been analyzed, but no such association was found [Stephens et al.2006].Women with pre-pregnancy weight less than 43kg or who gained <8kg during pregnancy, and maternal stunting (height<145cm) increases the risk of both term and preterm small for gestational age (SGA) babies resulting to HAZ <-2 Z-score [EDHS 2011].

Antenatal care visits of mother: Study conducted in Ethiopia indicated that, the odds of HAZ <-2 Z-score among <2 years old children, whose mothers have had no prenatal care visit were also 1.5 times more compared with children whose mothers had five or more prenatal care visits [Girma et al.2002].

Birth interval of the child: Study conducted by Girma and Genebo in Ethiopia showed that, children whose preceding birth interval was less than two years were 1.8 times more likely to be stunted as compared with children whose preceding birth interval was 48 months and more [Girma et al.2002].

Child's weight and size at birth: According to the study conducted in Ghana indicated that, children who were very small at birth had a higher probability to have HAZ <-2 Z-score than children with normal size. In Kenya, 62 % of children who had low birth weight (less than 2500gm) were had HAZ <-2 Z-score compared to 36 % of the children who were of optimal weight (above 2500gm) [Jessica Fanzo. 2012].

2.3 Birthsize, mortality and morbidity of children

There is sound evidence of birth weight rather than birth height being a strong predictor of adverse health consequences or death, but the debate remains about causality of size of birth to increased mortality or morbidity [Wilcox A. 2001].In populations having high prevalence of low birth weight, also the risk of death among infants is higher [UNICEF & WHO, 2004]. However in populations where both low birth weight and infant mortality are common, proportionally less low birth weight babies die than in better-off populations. This is called a paradox of low birth weight and it holds true in many groups of infants having high mortality rates, such as infants born to smoking mothers According to the Wilcox-Russel hypothesis size

at birth is associated with health and risk of death, but is not the causal path to morbidity or mortality [Wilcox A. 2001].

2.4 Trends in stunting and its magnitude, Ethiopia

All the three survey years focused that, onset of stunting is visible by 6-12 months of age and increases to ~24 months of age in all three EDHS surveys. In infants <6 months of age, stunting rates have not that much decreased, going from 23% (2005) to 14% in 2011 and 16% (2016). The EDHS 2011 data revealed that stunting rates are over 40% in Afar, Amhara, Tigray, and Benishangul-Gumu, with the highest rates in Tigray (52%). Rates in Oromiya, SNNPR, DireDawa, Gambela, Harar and Somali region range from 21-32% while Addis Ababa had the lowest rate (13%). Stunting prevalence in children under five have also reduced significantly going from 44% in 2011to 40% in 2014 mini EDHS and to 38%in 2016[EDHS 2011,2014 and 2016].

Analysis done in three DHS showed, that the factors associated with stunting include the child's age, male sex, low household wealth, low maternal education, shorter birth interval, smaller birth size, lower maternal height, low dietary diversity, low maternal BMI and having had diarrhea in the past 2weeks. Of note, the strongest effects/associations were with wealth. Infants and young children were 2.2 times more likely to be stunted if born to mothers in the poorest households rather than the richest households. Infants and children reported to have had a very small birth size were twice as likely to be stunted as those who were very large at birth. Girls were 25% less likely to be stunted than boys. For every unit increase in BMI, and maternal height (1 cm.), children were 3% and 6%, respectively, less likely to be stunted [EDHS 2011].

CHAPTER -THREE

3 .MATERIALS AND METHODS

3.1 Study area and period

The study was conducted in Addis Ababa in selected governmental health centers. The study was conducted from December 30, 2016, March 30, 2017 in Addis Ababa, the capital city of Ethiopia and the seat of the African Union & the United Nations World Economic Commission for Africa. Addis Ababa has a population size of over 3 million (3,384,569) with annual growth rate of 2.1% (data obtained from central statistical agency of Ethiopia 2007). The city is divided into ten sub-cities and 100 Kebeles (lowest administrative units in Ethiopia). Addis Ababa is located at 9° 1′ 48″ North and 38° 44′ 24″ East and the total land area is 54,000 hectares. Its average elevation is 2,405 m above sea level, and hence has a fairly favorable climate and moderate weather conditions [CSA, 2007].

The city has 42hospitals, thirteen are public hospitals of which 6 are under Addis Ababa Regional Health Bureau (AARHB) and 5 are specialized referral (central) hospitals. Furthermore, the city has 53 health centers under Addis Ababa Health Bureau. There are also two hospitals, three health centers and 31 clinics established by non-government organizations (NGOs), and 36 hospitals and more than 700 clinics that are privately owned [CSA, 2007].

3.2 Study design

This research was conducted by using a prospective cohort study in order to assess factors associated with length at birth at selected governmental health facilities.

3.3 Source population

The source populations were all pregnant women attending antenatal care and who were ≥32 weeks of gestation.

3.4 Study population:

The Study populations were pregnant women and their live-born singleton offspring who were born in the selected health centers, at Bole 17, Goro, Kazanchise and kirkos.

3.5 Sample size

The sample size was determined based on the formula used to estimate a single population proportion assuming that 14%stunting prevalence (EDHS, 2014) among under six month age infants. This rate was taken because there was no data on stunting at birth in our country. 5% margin of error, 95% confidence leveland10% non-response rate was assumed for the sample size calculation.

$$n=z^2p\ (1-p)/d^2$$

$n = (1.96)^2\ (0.14)\ (0.86)/\ 0.05^2 =$

Where:

- d = degree of precision = 0.05
- p = observed prevalence = 0.14
- Z at 95% confidence level =186
- 1-p = 0.86

The required sample size was 204 and with adjustment for non-response rate (10%).

3.6 Sampling procedure

Public health centers located in Addis Ababa with ANC and delivery services and client flow to the respective services were identified. Then, from a total of ten sub cities two sub cities were randomly selected from which four health centers were selected by lottery method. Study participant (pregnant women were selected depending on their gestational age or inclusion criteria). Sample size was assigned to each selected health facilities proportional to the number of pregnant mothers who are in the third trimester pregnancy. These mothers were recruited during the mornings of data collection time according to their order of arrival during their routine ANC visits. Recruitment was continued until the required sample size was obtained from each facility.

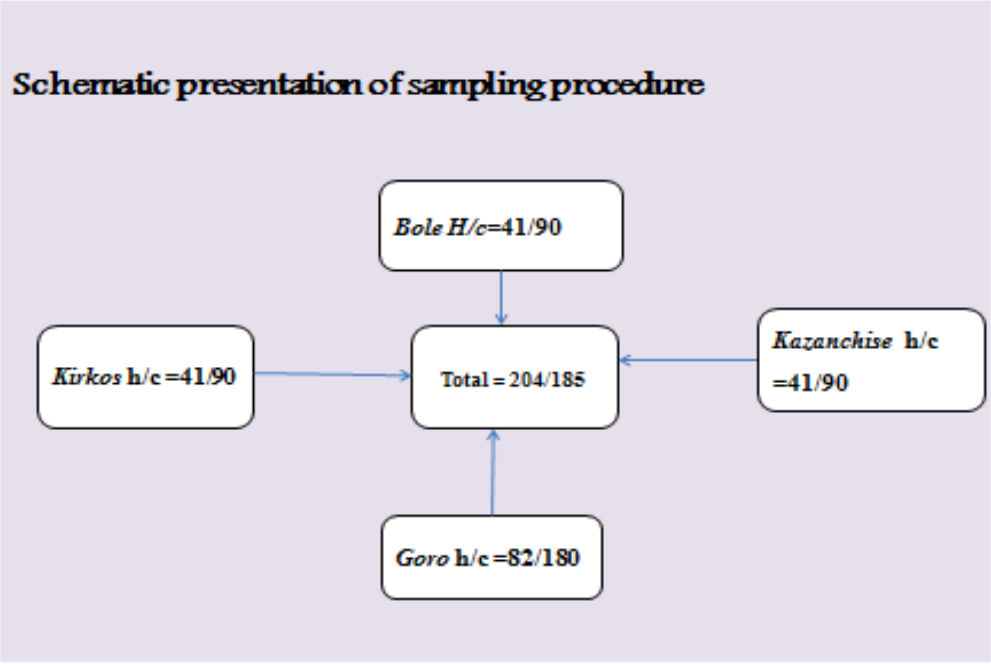

Figure 1: Schematic presentation of sampling procedure

3.7 Inclusion criteria

- Neonate born at term and who have no any health problems in selected facilities.

3.8 Exclusion criteria

- Preterm neonates and those in critical condition at birth, having communication problems or mothers who are not volunteers.

3.9 Data collection method

3.9.1. Study variables

- **Dependent variables**

Birth length

- **Independent variables**

Socio economic and demographic factors

- ✓ Mother's Ethnicity, Mother's Religion

Reproductive health factors

- Mother's age during Pregnancy

- ✓ Marital status of the mother
- ✓ Household Monthly income
- ✓ Mother's educational status
- ✓ Father's education status
- Number of previous pregnancies
- Preceding birth interval
- Mother's antenatal care visits
- Gestational age

Nutritional factors

- ✓ Height of the mother
- ✓ Weight gain during pregnancy
- ✓ MUAC during pregnancy
- ✓ Dietary diversity score
- ✓ Hemoglobin level
- ✓ Iron and folic acid supplement during pregnancy

3.9.2. Data collection procedures and instruments

Data on the socio-economic characteristics and food consumption patterns were collected by using a pretested and interviewer administered questionnaire that was adapted from the Ethiopian Demographic and Health Survey and FAO [EDHS 2011, FAO. 2011].The English version questionnaire was translated to Amharic language and again back-translated to English to check for consistency. The translated Amharic version questionnaires were pre-tested in similar area outside of the study site prior to the actual data collection.

Four data collectors who are health professionals were recruited from outside the study sites and were trained and informed about the purpose of the study to minimize bias during data collection. Beside the principal investigator, there was one additional supervisor. The supervisor and data collectors were trained using written documents and field practice method for one day on basic principles of data collection, on the questionnaire and how to do maternal nutritional assessment during data collection by the principal investigator. In addition training on data completeness, cross-checking and correction actions were given to the supervisor. Accordingly, the supervisor continuously followed and supervised data collectors.

3.9.3 Anthropometric measurements

The pregnant women were weighed at each visit from enrollment to delivery following the standardized procedures recommended by WHO [WHO, 2006]. Pregnant women were weighed

to the nearest 100 g on electronic scales with a weighing capacity of 10–140 kg. Their height was measured to the nearest millimeter with a portable device equipped with calibrated and standardized height gauges (SECA 2006 body meter). The mid-upper arm circumference (MUAC) of the left arm was measured to the nearest millimeter with a non-stretch measuring tape. Finally, the infant's recumbent supine length were measured three times according to standardized procedures using a SECA infanto-meter; the average length of three measurements was recorded to the nearest 0·5cm.

3.10 Data quality assurance

To maintain data quality, data collectors were trained and they were selected based on educational level, the work experience and knowledge (mostly midwifes) who have close relation with the work. Moreover 5% pretest of the questionnaires were done on 10 pregnant women outside the study area to see for the accuracy of responses, language clarity, appropriateness of data collection tool, and some modifications were made on the basis of the findings. The collected data was reviewed and checked for omissions, readability of handwriting, completeness and consistency by principal investigator and supervisor on a daily bases during the data collection.

3.11 Data processing and analyzing

After coding, the data was entered and checked using EPI INFO version 3.5.1 2008. It was cleaned and edited by simple frequencies and cross tabulation before analysis. Analyses were done by using SPSS version 2. Stunting was categorized using WHO definitions as HAZ <−2·0 and severe stunting was defined as HAZ <−3 Z-score. Descriptive statistic was carried out to compute frequency, percentage, and mean values as well as generate diagrams/graphs. To determine the predictors for stunting, binary logistic regressions was applied and the variables ($p \leq 0.05$) found to have association with the outcome variable were entered into multivariate analysis which uses to control confounding factors. Finally, the variables which have significant association were identified on the basis of p-values ≤0.05 and AOR, with 95% CI to measure the strength of the associations.

Operational Definitions

- **Anthropometry**: measurement of the variation of physical dimensions and the gross composition of the human body at different age levels and degrees of nutrition by weight-for-age, height-for-age and weight-for-height.
- **Stunting**: (low length-for-age): A child was defined as stunted or chronically malnourished if the length for age index was found to be below -2 SD of the median of the standard curve. Severe stunting was diagnosed if it was below -3 SD. The length-for-age index provides an indicator of linear growth retardation and cumulative growth deficits in children. Stunting also reflects failure to receive adequate nutrition over a long period of time and is affected by recurrent and chronic illness [WHO,2006].

- **Socio-economic Status** - defined by proxy indicators and ownership of properties e.g. source of income, occupation and type of housing.
- **Demographic factors-** These are the factors associated with the demographic characteristics of the study participants.

- **Dietary diversity-** This is the qualitative measure of food consumption that reflects household access to a variety of foods, and is also a proxy for nutrient adequacy of the diet of individuals (FAO, 2011).
- **Dietary diversity score**- The total sum of the different food groups consumed by the Study participants [FAO, 2011].
- **Women's dietary diversity score:** It was calculated the women to report the different food groups consumed by her own over the past 24 hours. WDDS was collected from the pregnant women by use of the FAO guidelines, and subjects were then divided into ~~"a~~dequate" (WDDS, **<5**) or ~~"i~~nadequate" (WDDS **≥5**) groups and calculated by giving a score of ~~"1~~" for those who consumed the food item and a score of ~~"0~~" for those who did not consume the food item over the past 24 hours preceding the interview. [36]. pregnant women were asked to recall the foods they had consumed in the previous 24hr briefly, first spontaneously followed by probes to ascertain that no meal or snack was left out. A detailed list of all the ingredients of the dishes, snacks, or other foods consumed was generated to enable better classification of mixed dishes. The foods were

then categorized into 9 food groups: 1) Grains, white roots and tubers; 2) Pulses; 3) Nuts and seeds; 4) Dairy; 5) Meat, poultry and fish; 6) Eggs; 7) Dark green leafy vegetables; 8) Other vitamin A-rich fruits and vegetables; 9) Other fruit; 10) Other vegetables [FAO, 2011].

3.12 Ethical clearance:

Ethical clearance was obtained from Research ethics committee (REC) of the College of Natural and Computational Sciences, AAU. Support letter was also obtained from the Addis Ababa regional health bureau.

CHAPTER- FOUR

4. RESULTS

4.1. Socio-demographic characteristic of study subjects

A total of 204 eligible pregnant women were enrolled, of whom 185 completed the study. The reasons for dropping out were mainly discontinuation of the ANC visits or not delivering at the same facility (n = 19), Overall, the dropout rate was 9.3%. The mean age of the respondents was 26.6 years with minimum age of 16 and a maximum of 41. The majority of the respondents were in the age group of 25-29 (73%). Majority of the women were married 170 (91.9%), twelve (6.5%) and three (1.6) women were single and divorced, respectively. Of all the participants 124 (67%) were housewives 34 (18.4%) were private employee and 27(14.6%) were grouped under different occupation status. In addition to these 38 (20.5%) were illiterate, followed by 64 (34.6%) with secondary level education, and 83(44.9%) with primary education. More than 80 % of the husbands had formal education. One hundred two (55.1%) husbands of the respondents were private employee (Table 1).

Table 1: Socio-demographic characteristics of a cohort of pregnant women at different Health center Addis Ababa, Ethiopia.

Variables		Frequency (%)
Maternal age	15-19	11(5.9)
	20-24	58 (31.4)
	25-29	73 (39.5)
	30-34	27 (14.6)
	>35	7 (3.8)
Marital status	Single	12(6.5)
	Married	170(91.9)
	Divorced	3(1.6)
Maternal educational status	Illiterate	38(20.5)
	primary education	83(44.9)
	Secondary education and above	64(34.6)
Maternal occupation	House wife	124(67)
	Private employee	34(18.4)
	Others *	27(14.6)
Husband educational status	Illiterate	21(11.4)
	Primary education	50(27)
	Secondary education	63(33)
	College	39(21.1)
Husbands occupation	Private employee	102(55.1)
	Others *	83(44.9)
Household monthly income	Low income(<1500 ETB)	38(20.5)
	High income(≥1500 ETB)	147 (79.5)

(*=students, Government employee merchants, NGO employee and daily laborers)

Total percentage that were not hundred for husband educational status and occupation was because marital status (single and divorced)

4.2. Reproductive health

The mean age at first pregnancy was 22. Fifteen years and 35 years were the minimum and the maximum age at first pregnancy, respectively. Sixty five (35.1%) women were primigravida

and majority 120 (64.9%) were multigravida. A total of 49 (26.5%) women had a history of abortion. 154 (83.2%) women had more than one antenatal care (ANC) follow up visit (Table 2).

TABLE 2: Reproductive health characteristics of pregnant women at different Health center Addis Ababa, Ethiopia.

Variables		Frequency (%)
Gravidity (# pregnancy)	Primigravida	65(35.1)
	Multigravida	120(64.9)
	Total	185(100%)
Abortion history	None	134(72.4)
	One times	49(26.5)
	Two times	2(1.1)
	Total	185(100%)
ANC visit number	First visit	31(16.8)
	Second and more	154(83.2)

4.3 Maternal dietary diversity

4.3.1 Types of food item consumed in the past 24 hours by pregnant women

The median intake of women dietary diversity score (WDDS) was five with the range of 2-8and the mean ± SD intake of dietary diversity score was 4.83 (± 2.06). Women with WDDS≥5 were ninety-three (50.3%) and were categorized under adequate dietary diversity score (DDS) while 92 (49.7%) women were categorized under inadequate (low) WDDS. In this study, majority of the study subjects 185 (100%) in the adequate and inadequate groups consumed grains, white roots and tubers, 158(85.4%) consumed pulses, and 152(82.2%) consumed other vegetables, respectively (Table 3).

Table 3: Proportion of pregnant women who consumed different food groups in the last 24 hours preceding the survey in Addis Ababa different health centers**.**

Food groups (n=185)	Frequency	Percent (%)
Grains, white roots & tubers	185	100
Pulses	158	85.4
Nuts and seeds	145	80
Dairy	79	42.7
Meat, fish and poultry	61	33
Eggs	53	28.6
Dark green leafy vegetables	63	34.1
Other vitamin A-rich fruits & vegetables	82	44.3
Other vegetables	152	82.2
Other fruits	84	45.4
WDDS -Inadequate (WDDS < 5)	92	49.7
-Adequate (WDDS ≥ 5)	93	50.3

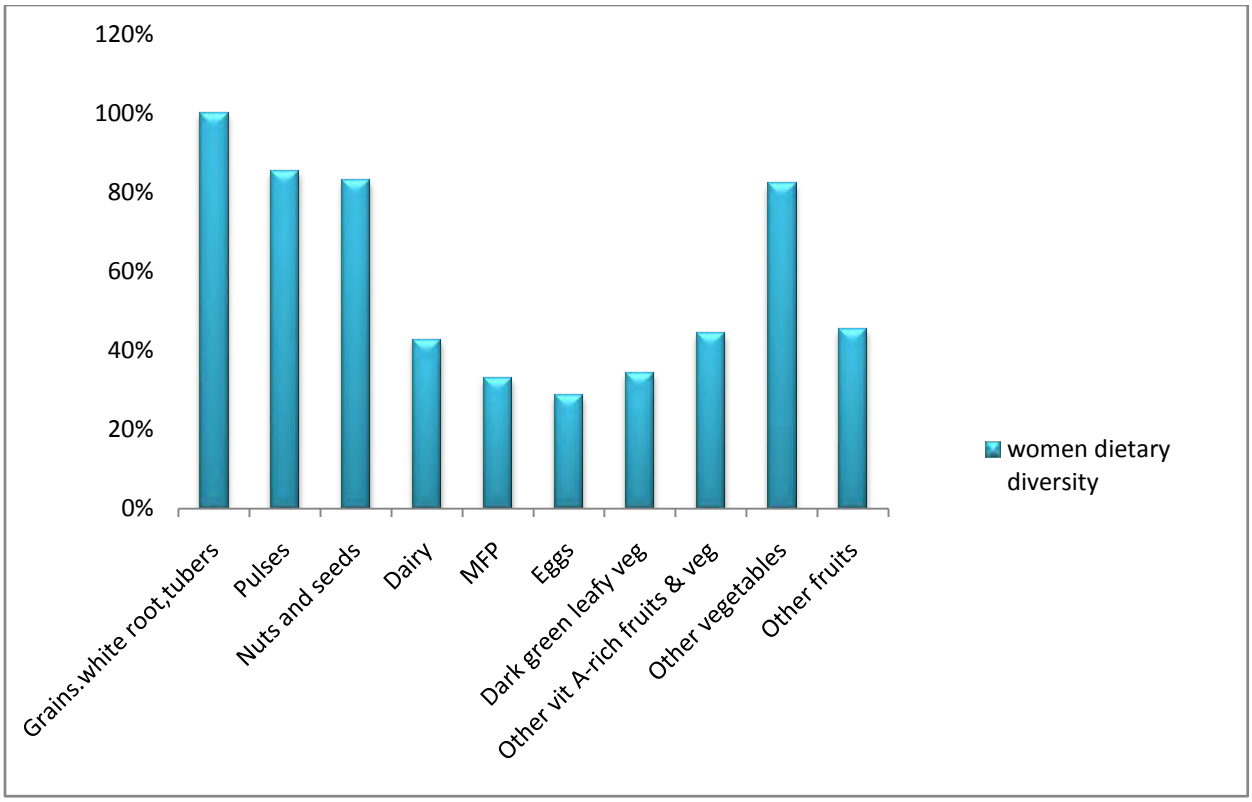

Figure 2: Food groups consumed by pregnant women according to category of WDDS

4.4 Health care factors and child characteristics

For all pregnant women hemoglobin data were taken from their follow up card and about fifty nine (31.9%) were anemic (hemoglobin level < 11gm/dl) according to WHO classification of anemia during pregnancy. Ninety seven (52.4%) of the respondents have taken Iron with folic acid (IFA) for three months. Thirty five (18.9%) and forty one women (22.2%) have taken IFA for two and one month, respectively. The rest twelve women (6.5%) were not taken IFA throughout their pregnancy. Fifty eight (31.4%) of the respondents consumed alcohol throughout their pregnancy. According to the recommended weight gain during pregnancy, majority 111(60%) had ≥ 8kg weight gain, whereas sixty nine (37.3%) had < 8kg weight gain throughout their pregnancy. Initial weight record was not available for five (2.7%) respondents and thus weight gain could not be calculated.

The mean height of all 185 mothers was 155.8 cm (SD 5·4) (range 147.0–170·0 cm), with a median of 155·0 cm. Majority of the respondents 162(87.6%) had MUAC values≥19cm, twenty three (12.4%) had MUAC cutoff point <19 cm, indicating maternal under nutrition. Gestational age was estimated by midwives at the health center, by counting from the last menstrual period and fundal palpation during ANC visits. All 185(100%) of the women gave birth at term (>37 weeks gestation).From total born babies, 93 (50.3%) and 92(49.7%) were females and males respectively. Birth weight was measured and recorded by midwives immediately after birth. Of the newborns, 164 (88.6%) were > 2500gm and twenty one (11.4%) were < 2500gm.

Birth length was measured immediately after birth by midwifes for neonates who were delivered at the same facility120 (64.9%). For those delivered in other facilities65 (35.1%) length measurement was taken within six days of postnatal visit. Majority 160 (86.5%) of the newborn babies had a length for age Z score (HAZ)≥-2 SD, whereas 25(13.5%) were stunted (LAZ<-2 SD).

Table 4: Health care factors and child characteristics of a cohort of pregnant women at different Health center Addis Ababa, Ethiopia. *n*=185.

Variables		Frequency (%)
Maternal Hemoglobin	9-11.5gm/dl	59 (31.9)
	>11.6gn/dl	126 (68.1)
	Total	185(100%)
IFA intake	Yes	173(93.5)
	No	12 (6.5)
IFA intake duration	For one month	41(22.2)
	For two months	35(18.9)
	For three months	97(52.4)
Weight gain during pregnancy	<8kg	69(37.3)
	≥8kg	111(60.0)
Maternal height	<150cm	41(22.2)
	≥150cm	144(77.8)
Maternal MUAC	<19mm	23 (12.4)
	≥19mm	162(87.6)
Age of babies in days	Birth	120(64.9)
	2-7 days	65(35.1)
Sex of babies	Males	92(49.7)
	Females	93(50.3)
Birth weight	<2500gm	21(11.4)
	≥2500gm	164(88.6)
Birth height	<45cm	20(10.8)
	≥45cm	165(89.2)
LAZ (Z-score)	< -2SD	25(13.5)
	≥ -2SD	160(86.5)

IFA=Iron-folic acid; MUAC= Mid-upper arm circumference, LAZ= length-for age Z-scores

4.5 Prevalence of infant stunting in the study area

The overall prevalence of LAZ <-2 Z-score (stunting) in the study participants was 13.5%. The sex specific prevalence of stunting in males was 18 (9.7%) while in females was 7 (3.8%)(**Figure 3**).

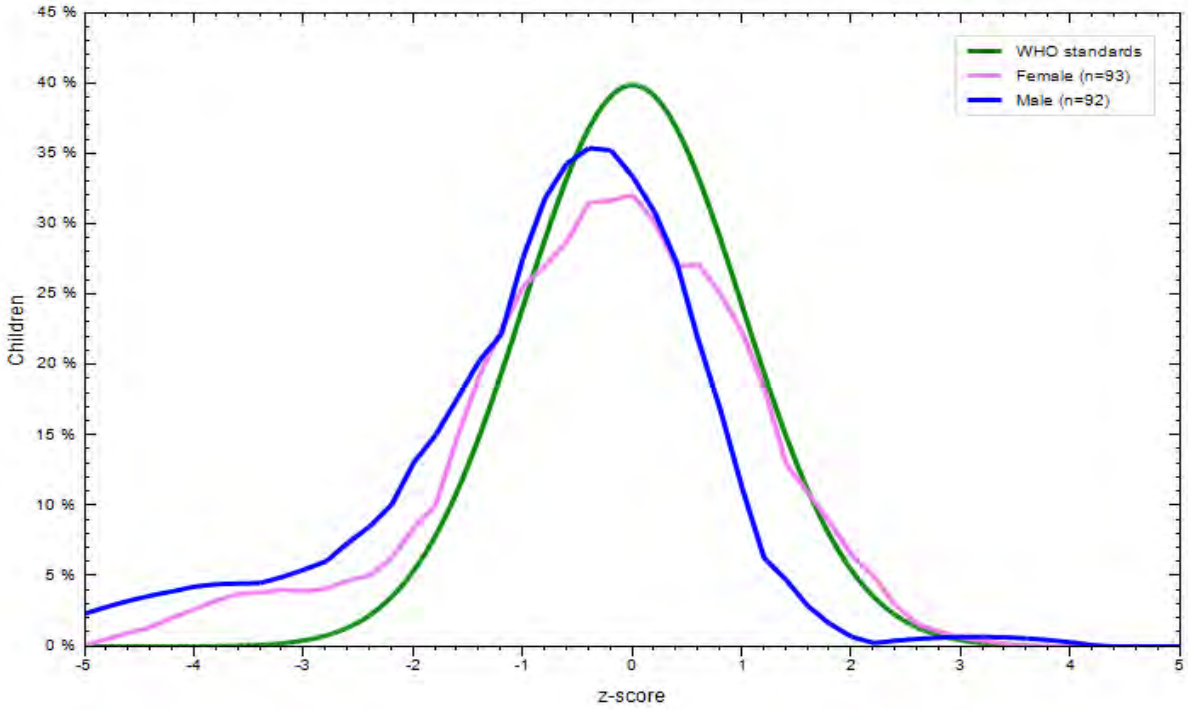

Figure 3: WHO standard, sex specific length for age Z score (LAZ) result.

4.6 Factors associated with length at birth

According to the bivariate analysis of socio-demographic variables, i.e. maternal occupation and marital status, health-care factors and child characteristics of participants such as maternal hemoglobin level, weight gain during pregnancy, maternal height, maternal MUAC, maternal dietary diversity, birth weight and sex of the babies were significantly associated with length at birth (outcome variable) relative to their respective reference group.

Table **5**below shows that health care factors and child characteristics, women with hgb level ≥11.5 gm/dl (67.7%) had a lower risk of giving birth to a stunted neonate than women with hgb level <11gm/dl (p-value 0.02 ;COR 3.92; 95% CI (1.64-9.38)). Women with MUAC cutoff point ≥19cm 162 (87.6%) had a lower risk of having stunted babies than those with a MUAC<19 cm 23 (12.4%) (P-value 0.00; COR 4.21; 95%CI (2.45-7.23). Those women with weight gain < 8kg throughout their pregnancy had a 1.34 times more chance of having stunted babies at birth than those who gained greater (p-value 0.00; COR .1.34; 95%CI (1.14-1.56)). In addition, taller women (≥150cm) were less likely to have stunted babies when compared to those with <150 cm (p-value 0.025; COR.36; 95%CI (.15-.88)). Women with WDDS of <5

were, 1.3 times more likely to have stunted babies than mothers with adequate (≥5) WDDS (p-value 0.042; COR1.25; 95%CI (1.009-1.608)). Low-birth weight babies had a higher likelihood of being stunted at birth (p-value .000; COR .085; 95% CI (.031-.234)). The sex of the child was also associated with length at birth. Male babies had a higher likelihood being stunted at birth than their female counter-parts (p-value 0.021; COR .34; 95% CI (.132-.845)).

In multivariate analysis, maternal MUAC, weight gain throughout pregnancy, baby's birth weight and sex of babies were the only determinant factors associated with length at birth. Accordingly, having all variables controlled, the odds of women whose MUAC less than19cm were more likely to deliver stunted babies than those with greater than 19cm(p-value .000; AOR .039; 95%CI (.008-.198)).For those women whose weight gain <8kg were more likely to deliver stunted babies than who gain ≥ 8kg (p- 0.041; AOR .233; 95% CI (.058-.944)).Babies born with weight <2500gm were more likely to be stunted compared to those whose birth weight ≥2500gm (p-value 0.015; AOR .132; 95%CI (.026-.656)).And male babies were more likely to be stunted compared to females (p-value 0.01; AOR .152; 95%CI (.035-.656)).

Table 5: Factors associated with length at birth in selected health centers in Addis Ababa, Ethiopia.

Variables	LAZ < -2SD Yes (n=25)	LAZ <-2SD No(n=160)	COR 95% CI	AOR 95% CI
Maternal Hgb				
9-11.5gm/dl	15(25.4)	44(74.6)	3.9(1.64-9.4)	.408(.098-1.42)
>11.5gm/dl	10(8)	115(95)	1.00	1.00
Maternal MUAC				
<19cm	12(52.2%)	11(47.8%)	4.21(2.45-7.23)**	.004(.015-.45)**
19.1-21.9	5(20.8%)	19(79%)	1.00	.37(.087-2.48)
>22	8(5.8%)	130(94.2%)	1.00	1.00
Weight gain				
5kg	13(31%)	29(69%)	1.34(1.14-1.56)**	.233(.058-.94)*
5-7kg	3(11.1%)	24(88.9%)	1.00	1.00
>7kg	7(6.3%)	109(93.7%)	1.00	1.00
Maternal height				
<150cm	11(52.4%	31(75.6%)	.36(.15-.88)*	.67(.197-4.295)
≥150cm	15(10.4%)	129(89.6%)	1.00	1.00
WDDS				
<5	16(17.4%)	76(82.6%)	1.25(1.009-1.6)*	.303(.56-6.24)
≥5	9(9.7%)	84(90.3%)	1.00	1.00
Birth weight				
<2500gm	11(52.4%	10(47.6%)	.085(.031-.234)**	.028(.051-.85)*
≥2500gm	14(8.5%)	150(91.5%)		
Sex of babies				
Male	18(19.6%)	74(80.4%)	.335(.132-.845)*	.031(.064-.88)**
Female	7(7.5%)	86(92.5%)	1.00	1.00

(Where * for p-value <0 .05 and ** for p-value < .001, ***students, Government employee, merchants and NGO employee WDDS, women dietary diversity score).

Table 6: Prevalence of stunting (LAZ <-2 Z-score) by sex in selected health centers in Addis Ababa, Ethiopia.

		LAZ-2SD		
Variables	**N**	**Mean**	**SD**	**Proportion of stunting (%)**
Boys	92(49.7%)	-0.92	1.9	19.6
Girls	93(50.3%)	-0.24	1.25	7.5
p-value			.021	

LAZ, length-for-age Z-score.

*Based on 2006 WHO growth standards

#stunting was defined as LAZ <−2·0 in relation to the WHO growth standards

CHAPTRE-FIVE

5. DISCUSSION

This prospective cohort study was conducted in selected health centers in Addis Ababa Ethiopia. The study enrolled pregnant women from third trimester pregnancy and followed them until delivery to investigate magnitude and factors associated with length at birth. To our knowledge, this study is the first study to examine factors associated with length at birth in the study area. The prevalence of length-for-age Z-score (LAZ) <-2 SD in this study was 13.5% and was associated with maternal MUAC, weight gain during pregnancy, birth weight and sex of the newborn.

The 13.5 % prevalence of stunting was in line with the EDHS figures for <6 months and reminds the need to work in the prenatal stage. However, the current figure was lower than values reported from Guatemala, where among 306 term infants33 % were stunted (median LAZ of − 1·50) [Noel w solomons.et al.2014]. On the other hand, a much lower prevalence was reported from studies in Thailand (6.2%) and Cebu, Philippines (5%) [Adair et.al.2002], although these studies have reported the prevalence of stunting at birth, they have no identified factors associated with it.

Stunting at birth was found to be related with maternal factors such as weight gain during pregnancy, MUAC and birth weight. The reason may be due to, poor dietary practices of the mother, impaired nutrient delivery to the placenta or both, as well as the environmental factors. Indeed, LAZ being a marker of chronic under nutrition; it is not new that maternal under nutrition is associated with stunting at birth. This further highlights the importance of the first 1000 days that commence from conception.

It was surprising to see that female newborn had a lower risk of stunting than male counterparts. This is in line with the findings in Guatemala [Noel w solomons.et al] and earlier reports that showed greater vulnerability to deficiencies among male infants [Bachou et.al. 2006]. This could be due to the faster growth rate of male children than female, which therefore increase demands for nutrients[Williams.et al.2006].In addition, we cannot exclude a heritable

genetic component for the slower intra-uterine linear growth retardation for sex prevalence of stunting.

One can speculate that, the general lack of attention to birth length might relate to the ingrained focus on birth weight as a variable of interest in clinical medicine and public health. Birth weight is relatively simple to measure, whereas length measurement can be much more complicated and can be accompanied by fear of causing skeletal injury to the newborn in trying to straighten the newborn. Along with distrustfulness about whether length can be measured consistently in routine data records, authorities and authors have widely disregarded birth length as a reliable variable and firmly focused their interest in early-life growth disorders of weight at birth. Most of the time under weight, classification by weight-for-age remains the dominant terms of references in early infancy, wide spread ignoring of an early onset chance of stunting [Liu Y et.al.2000].

For reasons mentioned above, the dominant anthropometric focus at birth and in early infancy is on body weight, than length measurement. But birth length should be often part of protocols in long-term cohort studies bridging from birth through childhood and towards adulthood, seeking to find association of early growth or health [Mostert D et al. 2005 & Mamabolo 2005]. According to UNICEF report early nutrition is also an important contributor to economic development in which a 1% loss in adult height due to childhood stunting is associated with a 1.4% loss in productivity. But, more recently length is measured at birth as part of studies evaluating inter-pregnancy interventions in the mother on outcomes of birth size and early growth [Saha et al.2009].

For example, in considering some determinant factors maternal weight gain throughout pregnancy to be significant in the study (p-value 0.00; AOR = .233; 95% CI .058-.94).The association between maternal weight gain throughout pregnancy and LAZ<-2Z-scoremight be due to poor dietary practices of the mother, impaired nutrient delivery to the placenta or both.

Finally, Body composition at birth, at preterm and impaired fetal growth, the new born body composition, Study of the INTERGROWTH-21st Project which was conducted in eight cities for the first time into routine neonatal care, a method for the early diagnosis of stunting then

monitored during infancy and child hood using the corresponding WHO child growth standards [Victora et al.2011].

5.1 Strength and limitations of the study

The strength of the study, introduction of the first birth cohort study design to be conducted in our country by using WHO Anthro growth standard.

However, there were a number of limitations that need to be taken in to consideration when interpreting the findings. Since the study was a facility based, generalization of the findings to the overall population of the study area is difficult. Although it is recognized that both pre- and early pregnancy factors are associated with length at birth, we were only able to follow the women starting from their third trimester and non-randomization of study participants.

CHAPTER-SIX

6. CONCLUSION AND RECOMMENDATION

6.1 CONCLUSION

By using 2006 WHO growth reference, this Prospective cohort study that enrolled pregnant women from third trimester of pregnancy till delivery, demonstrated that the prevalence of stunting at birth LAZ<-2 Z-score was 13.5%, indicating suboptimal pregnancy conditions. Analysis showed that maternal MUAC, mother's weight gain throughout pregnancy, birth weight and gender were significantly associated ($p < 0.05$) with babies with LAZ<-2 Z-score. This study has shown that stunting start before birth in this setting and those public health interventions that promote healthy pregnancy need strong emphasis. Right nutrition will be very important for the babies' whole life. Nutrition given during the first 1000 days will impact them lifelong growth, immunity and brain & vision development. In other words, these first 1000 days are the biggest chance to secure a healthy future for young infants and children.

6.2 RECOMMENDATION

With respect to the findings and objectives of the study, some recommendations have been made at different levels.

Government level

For Ethiopia to meet the Seqota Declaration, which suggests zero stunting by 2030, it will be urgent to understand further factors leading to stunting at birth. It will be important to know which interventions works best. The observed sex differences in the risk of stunting at birth will also require further in depth analyses. Though, impaired fetal linear growth starts in utero resulting in early infant linear growth failure indicating that prevention needs to start with maternal nutritional interventions before and after conception. This likely begins by mobilizing more immediate attention to the nutritional needs of the mother during pregnancy, both prior to and after conception that is focusing on the maternal determinants of supporting fetal growth.

Researchers

Nationally representative study involving diversified communities in the country is recommended. Especially community based comparative study complemented with qualitative data would be helpful.

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ANNEXES

Annex- I conceptual frame work

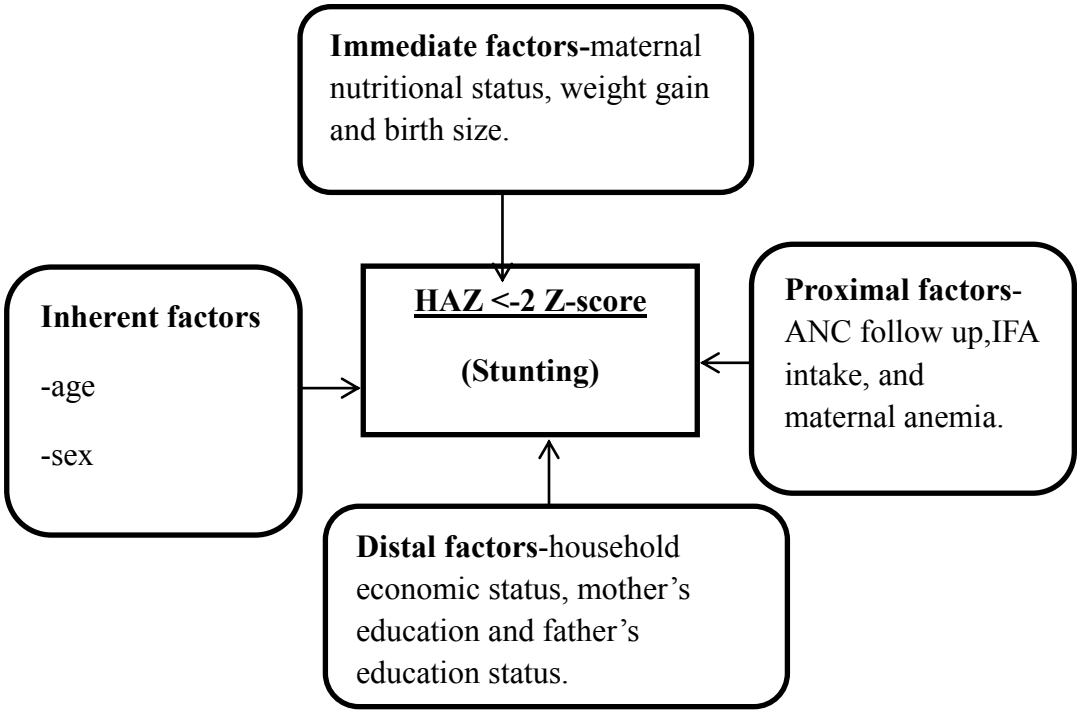

Figure 4: Conceptual hierarchical framework of HAZ<-2 Z-score

Annex-II Information sheet

Title: assessing the determinant factors associated with length at birth in selected governmental health facilities in Addis Ababa.

Name of Principal Investigator: Mekdes Aklilu

Name of the Organization: Addis Ababa University

Name of the sponsor: Self

Information sheet and consent form prepared for mothers who are at the third trimester pregnancy prior to the study to participate in this research project.

Introduction:- this information sheet and consent form is prepared with the aim of assessing magnitude of stunting and associated factors among new born babies in Addis Ababa at selected health facilities , Ethiopia, 2017. The research group includes the principal investigator, three data collectors and two supervisors.

Purpose of the study: - the aim this study is to assess factors associated with length at birth.

Procedure: - the study involves mothers at the third trimester and there new born babies in the selected institution in Addis Ababa town. You are selected to be one of the study participants and if you are willing to participate. We are so happy finally you are kindly requested to give your genuine response in the questionnaires.

Benefits, risk and/or discomfort: - by participating in this research project you may feel some discomfort in wasting your time (a maximum of 30 minutes). However, your participation is definitely important to assess the magnitude of stunting and associated factors at birth in AddisAbaba Ethiopia, 2017. There is no risk or direct benefit in participation in this research project.

Incentives/payments for participating: - you will not provide any incentives or payment to take part in this project.

Confidentiality: - we will keep the confidentiality by using codes instead of any personal identifiers and is meant only for the purpose of the study.

Right to refusal or withdraw: - you will not be forced to participate; you have the full right to refuse and have the right to discontinue the process at any point in this research.

Person to contact: - this research project was reviewed and approved by the ethical committee of the Addis Ababa University. If you have any question you can contact any of the following individuals and you may ask at any time you want.

Name: Mekdes Aklilu

Tele: + 251-911 86 75 24

E-mail: mekdesa27@gmail.com

If you have read the document and you have been given the chance to ask any questions now or at a later time or if the document has been read and explained to you agree to be in this study, may I continue?

- ☐ Yes
- ☐ No

Annex-III Amharic Version Information

የስምንት ማብራሪያ ቅጽ

የምርምር ፕሮጀክት ስም፡- በአዲስአበባ ከተማ በተመረጡ የመንግስት የጤና ተቁአማት አዲስ የተወለዱ ህጻናት ላይ ቁመታቸው ከዕድሜያቸዉ ጋር ሲነጻጸር ዝቅተኛ የሆኑትን ህጻናት መጠን እና ተጓዳኝ ምክንያቶችን ለመለየት የተዘጋጀ ነው፡፡

ዋና ተመራማሪ፡- መቅደስ አክሊሉ

የድርጅቱ ስም ፡- አዲስ አበባ ዩኒቨርስቲ ፡፡

የስፖንሰር ድርጅት ስም :-በግል ፡፡

በጥናት እና ምርምሩ ለሚሳተፉ እናቶች እና ህጻናት በጥናት እና ምርምሩ ከመካፈላቸው በፊት የተዘጋጀ ማብሪያና የስምምነት ቅጽ፡፡

መግቢያ፡- ይህ የስምምነት ቅጽ አሁን እርስዎ እንዲሳተፉበት የምንጠይቅዎትን የጥናት እና ምርምር የሚያብራራ ነው፡፡ በዚሁ ጥናት ለመሳተፍ ከመወሰንዎ በፊት ይህንን ቅጽ በጥንቃቄ በማንበብ ጥያቄዎች ካሉዎት ይጠይቁ፡፡ በዚህ ጥናት መሳተፍ ከጀመሩ በኃላም ቢሆን በማንኛውም ጊዜ ጥያቄዎች ካሉዎት መጠየቅ ይችላሉ፡፡

የጥናት እና ምርምሩ አላማ፡- የዚህ ጥናት እና ምርምር አላማ በመጨረሻ የእርግዝና ወቅት ላይ ያሉ እናቶችን አጠቃላይ ሁኔታ በመከታተል ቁመታቸው ከዕድሜያቸው ጋር ሲነጻጸር ዝቅተኛ ሆነው ለሚወለዱ ህጻናት መጠን እና ተጓዳኝ ምክንያቶችን ለመለየት ነው፡፡

የአሰራር ሂደት፡- ጥናቱ የመጨረሻዎቹ የእርግዝና ወራቶች ላይ የሚገኙ እናቶች እና አዲስ የተወለዱ ህጻናትን ያካትታል፡፡ የጥናቱ ተሳታፊ እንዲሆኑ በመመረጥዎየተሰማንን ደስታ እየገለጽን በጥናቱ ለመካፈል ፈቃደኛ ከሆኑ የሚጠየቁትን ጥያቄዎች በታማኝነት እንዲመልሱልን በትህትና እንጠይቃለን፡፡

የሚጠበቁ ጥቅሞች አደጋዎች ወይ አለመመቸት፡- በዚህ ጥናት በመሳተፍዎ ከ30 ደቂቃ በማይበልጥ የጊዜ ሽሚያ ምክንያት አነስተኛ የምቾት መጓደል ሊከሰትብዎ ከመቻሉ በስተቀር በርስዎም ሆነ በልጅዎ ላይ ምንም አይነት ጉዳት የማያደርስ መሆኑን እና በተሳትፎዎም ቀጥተኛ የሆነ ጥቅም የሚያገኙ መሆኑን አረጋግጣለሁ፡፡ የእርሶዎ ተሳትፎ ግን በ2009 ዓ.ም በአዲስ አበባ በተመረጡ ጤና ተቁአማት ላይ አዲስ የተወለዱ ህጻናት ቁመታቸው ከዕድሜያቸው ጋር ሲነጻጸር ዝቅተኛ የሆኑትን ህጻናት መጠን እና ተጓዳኝ ምክንያቶችን ለመለየት ለሚደረገው ጥናት እና ምርምር አላማ መሳካት ወሳኝ ነው፡፡

የተሳትፎ ክፍያን በተመለከተ፡- በዚህ ጥናት በመክፈልዎት ምንም የሚከፈልዎት ነገር የለም፡፡

ሚስጥር መጠበቅ፡- በዚህ ጥናት ከእርስዎ የሚሰጡት ምላሾች ሚስጥራዊነታቸዉ የተጠበቀ እንደሚሆን እየገለጽኩኝ

ለዚህም አላማ ሲባል የእርስዎም ሆነ የልጅዎ ስም በመጠይቂ ላይ የማይጻፍና በተለየ ኮድ የሚቀመጥ ሲሆን የጥናቱ የመጨረሻ ውጤት ከየእርስዎም ሆነ ከልጅዎ የግል ማንነት ጋር የማይገናኝ መሆኑን ከወዲሀ አረጋግጣለው።

የሚገኙት ሰው፡- ይህ ጥናት የጥናቱ ተሳታፊዎች ከጉዳት መጠበቃቸውን በሚያረጋግጠው አዲስ አበባ ዩኒቨርስቲ የስነ- ምግባር ኮሚቴ ታይቶ ድጋፍ አግኝቷል። ከጥናቱ ጋር በተያያዘ ለሚከሰቱ ማንኛም ዓይነት ጉዳዮች ከዚህ በታች በተቀመጠው አድራሻ ሊያገኙን ይችላሉ።

መቅደስ አክሊሉ ሞባይል፤ 09 11 86 75 24

Email: mekdesa27@gmail.com

ይህንን ቅፅ አንብበው ከሆነ እና አሁንም ሆነ በሌላ ጊዜ ጥያቄ ለመጠየቅ እድል ተሰጥቶዎት ከሆነ ወይም ይህ ቅጽ ተነቦ እና ተብራርቶሎት ከሆነ እርስዎ በጥናቱ ለመሳተፍ ወይም ላለመሳተፍ መስማማት እና አለመስማማትዎን ይግለጹልኝ?

እስማማለሁ : ☐

አልስማማም፡ ☐

Annex-III Structured Questionnaires English Version

Informed Consent

Hello, my name is _____ I am working in a research team of Addis Ababa University College of natural sciences department of food science and nutrition. This questionnaire is prepared to conduct a study on assessment of factors associated with length at birth, to complete the questionnaire designed by the researcher because you fulfill requirement for sampling. The finding of this study will help provide timely and proper nutritional and health care services to yours and other children's. Thus this interview is prepared for this purpose to get appropriate data on the study we are conducting. The data that I will obtain using this interview was used only for research purpose and your response was kept confidential. For this purpose your name will not be written here and there was no way of linking your individual responses to the final result of the study findings. The study has no risk to you and your child except sparing a maximum of 30 minutes of your time and if you face any problem in relation to the research you can contact responsible person based on the address below. You have the right not to respond at all or to withdraw in the meantime, but your participation is highly valuable for the success of our research objectives. Therefore, I politely request your cooperation to participate in this interview.

Do you agree to participate in this study?

Yes, _____ continue interviewing

No,_____ say, thank you!

Name: Mekdes Aklilu

Tele: + 251-911 86 75 24

E-mail: mekdesa27@gmail.com

Name of the interviewer_____ signature_____ Date_____

Questionnaire code_____

A. Identification

	Questions	Responses and coding category	Skip
001	ID Number		
002	Name of the health facility		
003	ANC visit number		

B. Demographic and socio-economic Characteristics

101	How old are you?	……(yrs.)	
102	What is your current marital status?	1. Married 2. Divorced 3. Widowed 4.Never married	
103	What is your educational level?	1.No education 2.No education, can read and write 3. Primary education (1-8) 4. Secondary (9-12) 5. Above secondary	
104	What is your husband's educational level?	1. No education 2. Primary education (1-8) 3. Secondary (9-12) 4. Above secondary	
105	What is the current main occupation of your husband?	1.Private employee 2.Government employee 3.Farmer 4.Daily laborer	

		5.Merchant 6. Others (specify)…….	
106	What is your main occupation?	1. House wife 2. Government employee 3. Non-government employee 4. Merchant 5. Self employee 6. Others (specify)----------	
107	What is your estimated monthly income	……(write the amount in ETB)	
108	What is your household total monthly income?	……(write the amount in ETB)	

C. Reproductive health Characteristic

S.NO	Questions	Response and coding	Skip
201	Is this your first pregnancy?	1.yes 2. No	If yes skip to Q. 203
202	How many pregnancies have you had before this pregnancy?	1. I 2. II 3. III and more	
203	How old were you, when you first gave birth?	……. (Enter age)	
204	Have you ever had an abortion?	Yes……1 No…….0	If no skip to the next
205	If yes to Q, 203, how many times did you have?	a) Induced……. (Enter number) b)Spontaneous……(Enter number) c) Total …….....(Enter number	

D. DIETARY DIVERSITY QUESTIONNAIRE

1. Quick food list form

Please describe the foods (meals and snacks) that you ate yesterday during the day and night, whether at home or outside the home. Start with the first food eaten in the morning (Write down all food and drinks mentioned by the respondent. When the respondent has finished, probe for meals and snacks not mentioned).

Breakfast	**Snack**	**Lunch**	**snack**	**Dinner**

	Now, I would like to ask some questions about your diet.	
301	Was yesterday a special day for you, such as a fasting day or a celebration/feast day? **Fasting day= 01** **Celebration= 02** **Usual= 03**	

The following questions are based on previous day recall. Can you please tell me if you ate any of the following foods yesterday during the day and night?

	Description of food items	**Consumed Yes =1 No =0**	
302	**CEREALS?** Rice, bread made of wheat, puffed rice, injera, pressed rice, noodles, or any other foods rice, wheat, maize/corn, or other locally available grains.	**--------Yes (1)** **---------No (0)**	
303	**VITAMIN A RICH VEGETABLES AND TUBERS?** Pumpkin, carrots, sweet potatoes that are orange and yellow inside	**-------Yes (1)** **--------No (0)**	
304	**WHITE TUBERS AND ROOTS OR OTHER STARCHY FOODS?** Potatoes, white yams, white sweet potato (not orange inside), potato crisps or other foods made from roots (not orange or yellow roots)	**--------Yes (1)** **--------No (0)**	
305	**DARK GREEN LEAFY VEGETABLES?** Dark green leafy vegetables, including spinach, kale, costa,	**--------Yes (1)** **---------No (0)**	

306	**OTHER VEGETABLES?** Other vegetables (e.g., squash, eggplant, green papaya, cauliflower, cabbage, onion, (beans),	**--------Yes (1)** **---------No (0)**	
307	**VITAMIN A RICH FRUITS?** Ripe mangoes, ripe papaya/	**--------Yes (1)** **---------No (0)**	
308	**OTHER FRUITS?** (e.g. banana, apples, guava, oranges, other citrus fruits, pineapple, watermelon, olives, grapes, (grapefruit) berries, , plum	**--------Yes (1)** **---------No (0)**	
309	**MEAT?** Beef, goat, lamb, chicken, duck or other birds, and/or liver kidney, heart or other organs	**--------Yes (1)** **---------No (0)**	
310	**EGGS?** Eggs of different birds – chicken, duck, turkey etc.; with yolk, without yolk	**--------Yes (1)** **---------No (0)**	
311	**FISH AND SEAFOOD?** Big/small fresh or dried fish or shellfish	**--------Yes (1)** **---------No (0)**	
312	**ANY FOODS MADE FROM BEANS, PEAS, OR LENTILS?** Beans, peas, lentils, other pulses, soybeans, peas	**--------Yes (1)** **---------No (0)**	
313	**MILK AND MILK PRODUCTS?** Milk, cheese, yogurt or other milk products	**--------Yes (1)** **---------No (0)**	
314	**OILS AND FATS?** Oil, fats or butter added to food or used for cooking including ghee	**--------Yes (1)** **---------No (0)**	
315	**SWEETS?** sugar, honey, sweetened soda or sugary foods such as chocolates, candies, cookies and cakes	**--------Yes (1)** **---------No (0)**	
316	**SPICES, CONDIMENTS, BEVERAGES?** Spices (cumin, coriander, salt), condiments (pickles, chutney), coffee, tea, etc.	**------Yes (1)** **-------No (0)**	
31	Probe for sickness:	**--------Yes (1)-** **--------No(0)**	
318	If yes, did sickness affect appetite?	**If yes, how?** **Increase=1** **Decrease=0**	

E. Health care factors and child characteristics

S. No	Questions	Response and coding category	Skip
	Health characteristics		
401	Do you check your hemoglobin level during this pregnancy?	1.yes 2..no	
402	If yes to Q.305	…….. (Enter the hgb level from card).	
403	Do you have taken iron with folic acid through this pregnancy?	1.yes 2.no	
404	If yes to question 305, for how long?	1.for ≤ one month 2.for ≥ two months 3.for ≥ three months	
405	Did you take any of the following since you became pregnant?	1. Low Alcohol content drinks, beer,tella,Wine, liquor, spirits 2. Drugs 3. Cigarette	
406	Do you know your weight before you became pregnant?	1.yes 2. No	
407	How much kilogramsdid you gain through this pregnancy?	……..(in kilograms)	
408	Anthropometric measurements of the mother	1.weight ……..(in kg) 2.height……(in cm) 3.MUAC……(in cm)	
409	Do you delivered at your expected date of delivery?	…… (Date in weeks)	
410	What is the sex of your child?	1.male 2.female	
411	How much is your child's age?	……(age in days)	
412	How much is your child's weight or size at birth?	1. Smaller than average (<2.5kg) 2. Average (2.5 -4 kg) 3. Large (>4kg)	
413	Anthropometric measurements of the babies?	1.Ht……(in cm) 2.wt…….(in kg)	

THANK YOU!!

Annex-V An[illegible]: Questionnaires

የስምምነት ማብራሪያ ቅጽ

ይህ የጥናት መጠይቅ የሚያተኩረው በአዲስ አበባ ከተማ በተለያዩ የመንግስት ጤና ተቋማት ላይ አዲስ የተወለዱ ህጻናት ቁመታቸው ከዕድሜያቸው ጋር ሲነጻጸር ዝቅተኛ የሆኑትን የህጻናትን ቁጥር እና ተጓዳኝ ምክንያቶችን ለመለየት የተዘጋጀ ነው።

ጤና ይስጥልኝ ስሜ ..... የተባልኩኝ እኔ በአዲስ አበባ ዩኒቨርሲቲ የምግብ ሳይንስና ኒውትሪሽን የጥናት እና ምርምር ባልደረባ ነኝ። ከላይ እንደጠቀስኩት ይህ ጥናት መጠይቅ የሚያተኩረው በአዲስ አበባ ከተማ በተለያዩ የመንግስት ጤና ተቋማት አዲስ የተወለዱ ህጻናት ቁመታቸው ከዕድሜያቸው ጋር ሲነጻጸር ዝቅተኛ የሆኑትን የህጻናትን ቁጥር እና ተጓዳኝ ምክንያቶችን ለመለየት የተዘጋጀሲሆን እርስዎ ለጥናቱ የሚያስፈልጉ መስፈርቶችን አሟልተው በመገኘትዎ የጥናቱ አካል አድርገንዎታል ፤ ስለሆነም የጥናቱ ግኝት ለርስዎ እና ለልሎችም ልጆች ወቅታዊ የስነ-ምግብ እና የጤና እንክብካቤ እንዲያገኙ ይረዳል። በመሆኑም ይህ መጠይቅ ሲዘጋጅ ተገቢ የሆኑ መረጃዎችን ለማግኘት ሲሆን ከእርስዎ የሚገኘው መረጃም ለጥናት እና ምርምሩ ተግባር ብቻ የሚውል ነው። ከእርስዎ የሚሰጡት ምላሾች ሚስጥራዊነታቸዉ የተጠበቀ እንደሚሆን እየገለጥኩኝ ለዚህም አላማ ሲባል የእርስዎም ሆነ የልጅዎ ስም በመጠይቁ ላይ የማይጻፍ እና የጥናቱ የመጨረሻ ውጤት ከእርስዎም ሆነ ከልጅዎ የግል ማንነት ጋር የማይገናኝ መሆኑን ከወዲሁ አረጋግጣለሁ።

በተጨማሪም ይህ መጠይቅ ከ30 ደቂቃ ያልበለጠ ጊዜ ከመሻማት ያለፈ በእርስዎም ሆነ በልጅዎ ላይ ምንም አይነት ጉዳት የማያደርስ ሲሆን ከጥናቱ ጋር በተያያዘ ለሚከሰቱ ማንኛውም ዓይነት ጉዳዮች ከዚህ በታች በተቀመጠው አድራሻ ሊያገኙን የሚችሉ መሆኑን እያስገነዘብኩ በጥናት ላይ ያለመሳተፍ እና የማቋረጥ መብትዎ የተጠበቀ ነው። የእርስዎ መሳተፍ ግን ከምንም በላይ ለጥናቱ ዓላማ መሳካት ወሳኝ በመሆኑ በመጠይቱ እንዲተባበሩኝ ስል በታላቅ አክብሮት እና ትህትና እጠይቃለሁ።

በጥናቱ ለመሳተፍ ፈቃደኛ ነዎት?

አዎ ..... ይቀጥሉ

አይደለም.....

አመሰግናለሁ!!!

መቅደስ አክሊሉ ሞባይል፤ 09 11 86 75 24

E-mail: mekdesa27@gmail.com

መጠይቁን የሚሰበስበው ሰው ስም_____ ፊርማ _____ቀን ————————
የመጠይቁ ኮድ————————

1. የቃለ መጠይቁ መለያ

ተ.ቁ	ጥያቄዎች	ምላሽ እና ኮድ	እለፍ
001	የቃለ መጠይቁ መለያ ኮድ		
002	የጤና ተቁአሙ ስም		
003	ለእርግዝና ክትትል የምልልስ ጊዜ		

2.ማህበራዊ፣ ኢኮኖሚያዊ እና ስነ-ህዝባዊ መረጃን በተመለከተ

ተ.ቁ	ጥያቄዎች	ምላሽ እና ኮድ	እለፍ
101	እድሜዎት ስንት ነው ?	———————— (በዓመት)	
104	የጋብቻ ሁኔታ?	1. ያገቡ 2. የተፋቱ 3. ባላቸውን በሞት ያጡ 4. ያላገቡ	
103	የትምህርት ደረጃዎ ስንት ነው?	1. ማንበብና መጻፍ አለመቻል 2. አንደኛ ደረጃ	

3.ለየስነ-ተዋልዶ ጤናን በተመለከተ

ተቁ	ጥያቄዎች	ምላሽ እና ኮድ	እለፍ
201	ይህ እርዝና ለስንተኛ ጊዜ ነው ?	1.ለመጀመሪያ ጊዜ ነው 2.ለሁለተኛ ጊዜ ነው 3.ለሶስተኛ እና ከዚያ በላይ ነው	
202	የመጀመሪያ ልጅዎን ሲወልዱ እድሜዎ ስንት ነበር	----------(ዓመት)	
203	የጽንስ ማቋረጥ አጋጥሞዎት ያውቃል ?	1.አዎ 2.አይደለም	መልሱ አይደለም ከሆነ ወደ 205 እለፍ
204	መልሱ አዎ ከሆነ እንዴት እና ለምንያህል ጊዜ ?	1.በራሱ ጊዚ የሆነ_____(በቁጥር) 2.በፍላጎት የተደረገ_____(በቁጥር) 3.በአጠቃላይ_____	
205	ይህ የእርግዝና ክትትልዎ ለስንተኛ ጊዜ ነው ?	1.ለመጀመሪያ ጊዜ ነው 2.ለሁለተኛ ጊዜ እና ከሂያ በላይ	

4 . የተለያዩ የተመገቧቸውን ምግቦች አስመልክቶ ለመጠይቅ የቀረቡ ጥያቄዎች

ከዚህ በመቀጠል በትናንትናዉ እለት ቀንም ሆነ ማታ ስለተመገቧቸው ጠንካራ ወይንም ፈሳሽ ምግቦች ልጠይቆት እ ፈልጋለሁ ቤትም ሆነ ከቤት ዉጭ የበላቸውን ማንኛዉንም ምግብ፣ መጠጥ ማጣፈጫ፣ ቅመሞች፣ መክሰስም ሳይቀር እንዲያስታውሱና እንዲነግሩኝ እፈልጋለሁ፡ ፡ በዚህ ቃለመጠይቅ ዉስጥ ትክክል ወይም ስህተት መልስ የለም፡ ፡ እርሶ

የሚነግሩን በእዉነት የተመገቡትን ብቻ ነዉ፡ ፡ ጥያቄ አለዎት ? ከሌለ እንጀምር

1. የምግብ አይነቶችን በፍጥነት መዘርዘር

እባክዎ ከትላንት ጠዋት 12 ሰኣት ጀምሮ አስከ ዛሬ ጠዋት 12 ሰኣት በቤትም ሆነ ከቤት ዉጭ የበሉትን ወይም የጠጡትን ሁሉ መክሰስንም ጨምሮ ይንገሩን ፡ ፡(ለጠያቂ ፡ የምግብ ትዉስታ ለመመዝገብ በተዘጋጀዉ ቅፅ ዉስጥ በተሰጠዉ ቦታ ላይ ዘርዝር/ ሪ),

ቁርስ	መክሰስ	ምሳ	መክሰስ	እራት

አሁን ደግሞ አመጋገቦትን በተመለከተ የተወሰኑ ጥያቄዎችን እጠይቆታለሁ :

ተቁ	ጥያቄዎች		ምላሽ እና ኮድ
301	የትላንትናው ቀን የተለየ ነበር ? ማለትም የጸም፣ የበአል ወይንም የግብዣ ቀን፣ ወይንስ ሁሌም	የጸም ቀን=01 የበአል ቀን=02	
	እንደተለመደው ነበር ?	የተለመደ ቀን=03	
ከዚህ በመቀጠል ያሉት ጥያቄዎች ደግሞ ያለፈዉ ቀን (የ 24) የምግብ ትዉስታ ላይ ያተኩራሉ ፣እባክዎ በትናንትናው እለት ቀንም ሆነ ሌሊት ከዚህ በታች ከተጠቀሱት የምግብ ዝርዝሮች ዉስጥ አንድም ቢሆን የተመገቡት ካለ ይጥቀሱልኝ ?			
	የምግቡ አይነት እና ዝርዝር ማብራሪያ	የአመጋገብ ሁኔታ _____አዎ (1) _____አይደለም (0)	

302	የእህል ዘሮችን በተመለከተ ?እንደ ሩዝ፣ዳቦ፣እንጀራ፣ስንዴ፣ ማሽላ ፣ በቆሎ የመሳሰሉትን ወይንም በአካባቢው የሚገኙ የጥራጥሬ አይነቶችን ተመግበው **ነበረ** ?	_____አዎ (1) _____አይደለም (0)	
303	በቫይታሚን ኤ የበለጸጉ አትክልቶችንስ ?እንደ ዱባ፣ካሮት እና ስኳርድንች የመሳሰሉትን?	_____አዎ (1) _____አይደለም (0)	
304	ነጭ ስር ያላቸው አትክልቶችንስ ?እንደ ድንች፣ነጭ ስኳር ድንች የመሳሰሉትን ?	_____አዎ (1) _____አይደለም (0)	
305	አረንጓዴ ቅጠል ያላቸውን አትክልቶችንስ ?እንደ ስፒናች፣ቆስጣ የመሳሰሉት ?	_____አዎ (1) _____አይደለም (0)	
306	ሌሎች አትክልቶችንስ? እንደ ጎመን፣ **አበባ** ጎመን፣ሽንኩርት የመሳሰሉትን ?	_____አዎ (1) _____አይደለም (0)	
307	በቫይታሚን ኤ የበለጸጉ ፍራፍሬዎችንስ ?እንደ ፓፓያ፣ ማንጎ የመሳሰሉትን ?	_____አዎ (1) _____አይደለም (0)	
308	ሌሎች ፍራፍሬዎችንስ ?እንደ ሙዝ፣አፕል፣አናናስ፣ብርቱካን፣ ኮምጣጤ፣ሀባብ፣ወይን የመሳሰሉትን ?	_____አዎ (1) _____አይደለም (0)	
309	ስጋስ ?የ ከብት፣የፍየል፣የጥጃ፣የዶሮ፣ኩላሊት እና ጉበት የመሳሰሉትን ?	_____አዎ (1) _____አይደለም (0)	
310	እንቁላልስ ?	_____አዎ (1) _____አይደለም (0)	
311	የተለያዩ የአሳ አይነቶችንስ ?	_____አዎ (1) _____አይደለም (0)	

312	የትኛዉንም አይነት ከባቄላ፣ከአተር፣ከምስር ከመሳሰሉት የተሰሩ ምግቦችንስ ?	አዎ (1) _____አይደለም (0)	
313	ወተትና የወተት ተዋፆችንስ ? እንደ ወተት፣አይብ፣እርጎ የመሳሰሉትን ?	_____አዎ (1) _____አይደለም (0)	
314	ዘይትና ቅቤ የመሳሰሉትንስ ?	_____አዎ (1) _____አይደለም (0)	

315	ጣፋጮችንስ?እንደ ስኳር፣ማር፣ጣፋጭ ምግቦች እንደ ቸኮሌት፣ ከረሜላ፣ኩኪስ እና ኬክ የመሳሰሉትን?	አዎ (1) _____አይደለም (0)	
316	ቅመማቅመሞች፣ማጣፈጫዎችን እና የሚጠጡ ነገሮችንስ? የተለያዩ ቅመሞች፣ጨዉ፣ሚጥሚጣ፣ቡና እና ሻይ የመሳሰሉትን?	አዎ (1) _____አይደለም (0)	
317	ህመም አጋጥሞሽ ከነበር, በህመም ወቅት የአመጋገብዎ ሁኔታ ይቀየራል ?የምግብ ፍላጎትሽስ?	_____ይጨምራል (1) _____ይቀንሳል (0)	

5. የጤና እንክብካቤን እና የልጅ ሁኔታን በተመለከተ

ተቁ	ጥያቄዎች	ምላሽ እና ኮድ	እለፍ
401	ለደማነስ ልኬት መጠን ምርመራ አድርገዋል ?	1.አዎ 2.አይደለም	አይደለም ከሆነ እለፍ
402	መልሱ አዎ ከሆነ	_____(መጠኑን ከካርዱ ላይ በቁጥር ያስቀምጡ)	
403	የደማነስ መከላከያ መድሃኒት በዚህ እርግዝና ወስደዋል?	1.አዎ 2.አይደለም	አይደለም ከሆነ እለፍ
404	መልሱ አዎ ከሆነ ለምን ያህል ጊዜ ?	1. ለአንድ ወር 2.ለሁለት ወር 3.ለሶስት ወር እና ከዚያ በላይ	
405	በእርግዝናዎ ወቅት የሚጠቀሟቸው ነገሮች ነበሩ ?	1.አልኮልነት ያላቸውን መጠጦች (ቢራ፣ጠላ፣ አረቄ፣ወይን የመሳሰሉትን) 2. ሲጋራ 3. አደንዛዥ መድሃኒት	
		4 ሌላ ካለ ይንገሩን	
406	ከማርገዝዎ በፊት የነበሮትን ክብደት ያውቁታል?	1.አዎ 2.አይደለም	
407	ካረገዙ በኋላ ምን ያህል ክብደት የጨመርሩ ይመስሎታል?	_____(በኪ.ሎ ግራም)	

408	የሰውነት አቋም ልኬት	ቁመት_____ (በሴንቲ ሜትር) ክብደት _____ (በኪ.ግ) መ.አክ_____ (በሜትር)	
409	የመውለጃ ጊዜዎ ደርሶ ነው የወለዱት ?	_____(ጊዜውን በሳምንት አስቀምጥ)	
410	ልጅዎ ከተወለደ ስንት ቀኑ ነው ?	_____ (እድሜውን በቀናት አስቀምጥ)	
411	የልጅዎ ፆታ ምንድን ነው ?	1.ወንድ 2.ሴት	
412	ልጅዎ ሲወለድ የነበረው ክብደት ስንት ነበር	1.ከ2.5 ኪ.ግ ያነሰ ነበር 2.ከ2.5 - 4ኪ.ግ ነበር 3.ከ 4 ኪ.ግ ይበልጥ ነበር	
413	የህጻኑ የሰውነት አቋም ልኬት	ቁመት/ርዝመት_____(በሴንቲ መትር) ክብደት_____ (በኪ,ግ)	

አመሰግናለሁ !