DETERMINANTS OF LOW BIRTH WEIGHT AMONG NEWBORNS DELIVERED IN SILTE ZONE PUBLIC HEALTH FACILITIES, SOUTHERN ETHIOPIA: A CASE CONTROL STUDY.

By: Shafi Seid Amda (BSc in public health)

A Research thesis to be Submitted To Jimma University, Institute Of Health, Faculty Of Public Health, Department Of Nutrition And Dietetics For Partial Fulfillment Of The Requirement Of Degree Of Masters of Science In Human Nutrition.

July, 2020

Jimma, Ethiopia

DETERMINANTS OF LOW BIRTH WEIGHT AMONG NEWBORNS DELIVERED IN SILTE ZONE PUBLIC HEALTH FACILITIES. A CASE CONTROL STUDY.

By: Shafi Seid (BSc)

Advisors: Dr.Beyene Wondafrash (MD, MSc, PhD)

Nurezeman Gali (BSc, MSc)

July, 2020

Jimma, Ethiopia

Abstract

Background*;* Low birth weight which is associated with a wide range of both short- and long-term consequences remains a formidable public health challenge for the 21st century. Despite the presence of different prevention options and efforts it is estimated that 15% to 20% of all births worldwide are low birth weight. Although several studies have been conducted in different countries including Ethiopia, most of the studies conducted didn't considered the food security status, environmental related and maternal dietary diversity related factors.

Objective: - To identify determinant factors of low birth weight among newborns.

***Method*;** Facility based unmatched case control study was employed from March 15, 2020 to June 16, 2020 among 84 cases and 168 controls in selected public health facilities of Silte zone. Cases were newborns with birth weight less than 2500gm and controls were newborns with birth weight greater than 2500gm. The data were collected using semi structured, pretested interviewer administered questionnaire. Multivariable logistic regression analysis was carried out to identify independent determinants of Low birth weight, and variables with a p-value <0.05 were considered to be statistically significant.

Results: The mean birth weight was 2154.94gm ± 233.43 gm SD for cases and 3022.92gm ± 311.88 gm for controls.not iron and folate supplementation during pregnancy(AOR=4.175, 95%CI;(1.437,12.300), not taking additional meal(AOR= 3.096, 95%CI(1.278,7.502)), maternal hemoglobin level <11g/dl**,** (AOR = 5.213, 95% CI (1.923,14.130), house hold food insecurity (AOR= 6.853, 95%CI;(3.008, 15.613))and inadequate minimum dietary diversity of women(AOR=4.131(1.403,12.158)were found to be independent determinants of low birth weight.

Conclusion and recommendations: Lack of iron and folate supplementation during pregnancy, maternal meal frequency during pregnancy, maternal hemoglobin level, Food insecurity and inadequate Minimum dietary diversity of women were significant determinants of Low birth weight. The importance of additional food and iron and folate supplementation during pregnancy, and proper identification of high risk mother needs to be strengthened effort to reduce incidence of Low birth weight infants. In addition, working with agricultural sector, Women affairs targeting pregnant women in improving women dietary diversity. Health extension workers and health professionals in each health facility working at ANC clinic should give advice pregnant mothers about use and adherence of iron folate, additional meal, and dietary diversity.

Key words; Low birth weight, Preterm, Newborn

Acknowledgment

First of all, I give thanks to Allah that granted me the health, the ability, the zeal, and the courage to prepare this thesis. Then I would like to present my heartfelt thanks to my Advisors Dr. Beyene Wondafrash and Mr.Nurezeman Gali for their intensive guidance, being available and sparing their valuable time to help me in all possible ways for this thesis & I would also like to thank Jimma University Institute of Health, Department of Nutrition and dietetics for providing me this golden opportunity to develop this thesis. My acknowledgment also extends to Silte Zone Health Department, each health facilities, data collectors, my families and friend for their Cooperation and support.

Table of Contents

Abstract I

Acknowledgment I

List of tables IV

List of figures V

LIST OF ABBREVIATIONS AND ACRONYMS VI

CHAPTER ONE 1

1 INTRODUCTION 1

1.1 Background 1

1.2 Statement of the problem 2

2; LITERATURE REVIEW 4

1.3 Significance of the study 13

CHAPTER 14

3; THREE OBJECTIVE 14

CHAPTER FOUR; 15

5; METHODS AND MATERIALS 15

4.1 Study area and period 15

4.2 Study design 15

4.3 Source population 15

4.4 Study population and study unit 15

4.5 Eligibility criteria for cases and controls 15

4.5.1 Inclusion criteria for cases 15

4.5.2 Exclusion criteria for both cases and controls 15

4.6 Sample size determination 16

4.7 Sampling procedure 17

4 8 Study variables 19

4.8.1, Dependent variables 19

4.8.2, Independent variables 19

4.9 Operational and Standard definitions 20

4.10, Data collection tools and procedures 22

4.11 Data quality control 23

4.12, Data processing and analysis 24

4.12 Ethical consideration 24
4.13 Dissemination of the finding 24
Chapter five 25
Result 25
Chapter six Discussion 36
Chapter seven 38
References 40
Annexes 45

List of tables

Table 1Sample size determination using different exposure variables to study predictors of low birth weight in silte zone public health facilities, southern Ethiopia, 2020..... 17
Table 2;Distribution of socio-economic and demographic characteristics among mothers of LBW case and NBW controls in Silte zone public health facilities, southern Ethiopia, 2020 25
Table 3; Distribution of infant, medical and obstetrics characteristics among mothers, of LBW cases and NBW controls in Silte zone public health facilities, southern Ethiopia, 2020 27
Table 4: Nutritional and anthropometric characteristics among mothers, of LBW cases and NBW controls in Silte zone public health facilities, southern Ethiopia, 2020..... 28
Table 5;Environmental related characteristics among mothers, of LBW cases and NBW controls in Silte zone public health facilities, southern Ethiopia, 2020. 29
Table 6; Bivariate analyses of socio demographic factors to identify candidate variables for multivariable logistic regression to identify determinants of LBW, Silte zone Southern, Ethiopia, 2020. 30
Table 7; Bivariate analyses of medical, obstetric and behavioural factors to identify candidate variables for multivariable logistic regression to identify determinants of LBW, Silte zone Southern, Ethiopia, 2020. 31
Table 8; Bivariate analyses of Nutritional factors to identify candidate variables for multivariable logistic regression to identify determinants of LBW, Silte zone Southern, Ethiopia, 2020. 32
Table 9; Bivariate analyses of Environmental factors to identify candidate variables for multivariable logistic regression to identify determinants of LBW, Silte zone Southern, Ethiopia, 2020. 33
Table 10;Determinants of LBW In multivariable logistic regression analysis for newborns delivered in Silte zone public health facilities, southern Ethiopia, 2020. 35

List of figures

Figure 1Conceptual framework adapted from literatures to assess determinants of low birth weight among new born in Silte zone, public health facilities, south Ethiopia 2020 12

Figure 2; Schematic presentation of sampling procedure, Silte zone public health facilitiess, South Ethiopia, 2020 18

LIST OF ABBREVIATIONS AND ACRONYMS

ANC	Antenatal Care
AOR	Adjusted odds ratio
CI	Confidence interval
COR	Crude odds ratio
EDHS	Ethiopian Demographic and Health Survey
HC	Health Center
Hgb	Hemoglobin
HIV/AIDS	Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome
IUGR	Intrauterine growth restriction
LBW	Low birth weight
LMP	Last menstrual period
MUAC	Mid-Upper Arm Circumference
MDD-W	Minimum dietary diversity for women
NBW	Normal birth weight
NICU	Neonatal intensive care unit
NGO	Non- governmental organization
OR	Odds ratio
RCT	Randomized controlled trial
S.D	Standard deviation
SGA	Small for Gestational Age
SPSS	Statistical Package for Social Sciences
UNICEF	United Nations International Children's Fund
UNSCN	United Nations System Standing Committee on Nutrition
WHO	World health organization

CHAPTER ONE

1 INTRODUCTION

1.1 Background

Birth weight is the first weight of the fetus or newborn measured soon after the birth. Measurement should ideally be done within the first hour of life to avoid significant postnatal weight loss (1). Based on this new born is classified as large for gestational age normal for gestational age and small for gestational age(2). World health organization (WHO) defines Low birth weight (LBW) as weight at birth of less than 2500 gram. The more severe form of it is very low birth weight (VLBW) which is birth weight of less than 1500 grams, and the worst is extremely very low birth weight that is birth weight of <1000 gram. It is the type of small for gestational age (SGA) which lowers survival status of new born and increase risk of perinatal death and severe disability (3,4).

Duration of gestation and intrauterine growth rate determines birth weight. Low birth weight is thus caused by either a short gestation period or retarded intrauterine growth or a combination of both. Prematurity is a gestational age of less than 37 weeks. Whereas intrauterine growth restriction (IUGR) is defined as: birth weight less than 10th percentile for gestational age; birth weight less than 2500 g and gestational age greater than or equal to 37 weeks; and birth weight less than 2 standard deviations below the mean value for gestational age(5) In turn Intrauterine growth restriction and Prematurity results from complex and multiple factors. While Intrauterine growth restriction is the result of poor maternal nutritional status at conception, low gestational weight gain, short maternal height and infectious diseases during pregnancy, prematurity is caused by maternal high blood pressure, acute infections, hard physical work, multiparty, and psychological factors(6).

Globally, Low birthweight has long been used as a good summary measure of public health problem that includes long-term maternal malnutrition, ill health, hard work and poor pregnancy health care Individually it is also a critical determinant for survival in the neonatal period and for future growth and development of the new born, since new born with the low birth weight starts life with a handicap and this may persist in future(7)Birth weight is a powerful predictor of infant growth and survival. Infants born with low birth weights begin life immediately disadvantaged and face extremely poor survival rates.,(8) Malnourished mothers are at increased risk for complications and death during pregnancy and childbirth and their infants are more likely to have low birth weight, fail to grow at a normal rate, and have higher rates of disease and death. (9) Being low birth weight during early development have a profound impact

on one's risk for development of future adult disease. It is, a surrogate marker of poor fetal growth and nutrition, is linked to coronary artery disease, hypertension, obesity, and insulin resistance(10).

1.2 Statement of the problem

Low birth weight is a global challenging public health problem. It is a most significant risk factor for adverse health outcomes including common childhood diseases. The UNICEF-WHO low birthweight estimates indicate that one in seven livebirths – 20.5 million babies globally suffered from low birth weight in 2015(1). Similarly 6.9% from UK and 7% from Germany are born either premature or small for gestational age (SGA)(11).

Low and middle income countries account for a disproportionate burden of Low birth weight in which over 91% of the world's LBW infants are born in Low and middle income countries from this 9.3 million of them in South Asia and 3.1million in sub-Saharan Africa(12).Africa was home to about one quarter of all low birthweight newborns, with the majority born in Eastern and Western Africa, 11 % and 14% respectively (13).

According to Ethiopian demographic health survey(EDHS) 2016 estimates, 13% of them weighed less than 2.5kg at birth.The previous DHS survey revealed that 14% LBW in 2005, 11% in 2011 ,according to mother's report, 16% of births are very small, 10% are smaller than average (14–16).

Low birth weight is the major predictor of infant morbidity and that it contributes substantially to the overall burden of childhood mortality. Being born with LBW is generally recognized as a disadvantage for the infant. Globally Low birth weight contributes to 60% to 80% of all neonatal deaths(17) . In both developed and developing countries, LBW is an important cause of perinatal mortality and both short- and long-term infant and childhood morbidity, Deaths of LBW infants are 30 times more frequent than deaths of newborns of normal birth weight and they are many times more likely to end up with long-term handicapping conditions (18). They are also at higher risk of perinatal death, adulthood stunting that in turn leading to the intergenerational effect of malnutrition in the affected community (19).

In Ethiopia, the prevalence of under-five mortality ranges from 53 to 169 per 1000 live births out of this neonatal mortality which is mainly attributed by LBW accounts the largest portion. In Ethiopia, in 2014, there were 27,243 deaths due to low birth weight accounting 4.53% of the total deaths (20)

Low birth weight has a significant economic burden for the health system and families. It is one of the most important factors for perinatal mortality and morbidity in both developing and developed countries and contributes to several poor health outcomes It is associated with poor neurological and cognitive

development (LBW individuals had lower IQs compared with the normal birth weight group)(21) childhood morbidity, growth impairment, a range of poor health outcomes, and chronic diseases later in life. It is a cause of both short-term and long-term consequences leading to adverse social and economic impacts (22).

According to different studies in different parts of developing and developed countries: socio demographic medical and obstetric factors, nutritional related factors, behavioral related factors, infant and environmental related factors are potential risk factors for occurrence of low birth weight(18–20,23–25).

World Health Assembly set a policy target to reduce LBW by 30% by the end of 2025with given emphasis on the packages of care provided at the prenatal, ante-natal, intra-natal, and post-natal period interventions to prevent low birth weight, its components(preterm birth and small for gestational age) and their associated morbidity and mortality, with emphasis on community settings.(26)

Similarly, Ethiopia has adopted the WHO recommendations similar strategies have been implementing. Additional to the comprehensive care that is provided for women and newborns from pregnancy to the postnatal period there is also information that provides insights into the health workforce, health policies, health information and community mobilization relevant to preterm birth and low birth weight Support for adequate feeding with breast milk, continuous skin to skin contact, antibiotics, and antenatal corticosteroids(27).

Despite the enormous prevention options and efforts, LBW still remains a formidable public health challenge for the 21st century and more detailed research is needed to illuminate factors affecting LBW. However as far as my knowledge is considered still a little is known about this paradox, only scanty studies have been conducted regarding the maternal nutritional status, food insecurity, dietary practices and the environmental related factors with regard to as a risk with for low birth weight in Ethiopia(25). Therefore The aim of this study is to identify contextual factors associated with food insecurity, maternal nutritional status, MDDS and environmental factors.

CHAPTER TWO

2; LITERATURE REVIEW

LBW is a multifaceted public health problem and a major determinant of mortality, morbidity and disability in neonatal period, infancy and child hood. LBW has a long term impact on health outcomes of adult life with a substantial cost to the health sector and imposes a significant burden on the society due to non-communicable diseases. Further it is an intergenerational problem in which infants with low birth weight, if not interfere adequately, grow up to be undernourished and stunted as children and adolescents and, ultimately, undernourished women of child bearing age who will be undernourished during pregnancy and then will deliver LBW infants. Hence, birth weight is an essential element in the success of national and global efforts to improve child health, and a major target for public health intervention. AS a result, birth weight-especially low birth weight and its determinants have become a focal area for clinical and epidemiological investigations worldwide((13). Identifying the determinants of low birth weight is important because of the health risks associated with low birth weight. These factors are related to the infant, the mother or the physical environment and play an important role in determining the infants birth weight and future health (1).The following are some factors found to be determinant of LBW broadly falls into four categories: socio-demographic and socioeconomic factors, medical and obstetric, and food security and dietary factors, behavioral factors and environmental factors.

Socio demographic and socioeconomic determinants of low birth weight

Socio demographic characteristics such as age of the mother, socio economic status, and educational status of mothers are determinants of low birth weight(13,30).In addition, in most of the countries, increased risk of LBW in newborns born to mothers with certain specific characteristics, such as residing in rural communities, as well as lower wealth status of households in comparison with the rich group(31).

Case control Study conducted in in Germany showed that women with a lower secondary school certificate were 2.6 times more likely to have a child with LBW than those with university/ technological college entrance certificate (32).

Systemic review done on risk factors associated with low birth weight in America show Sociodemographic conditions were predictors of LBW. Maternal age as a predisposing factor, since LBW as an outcome is higher in mothers older than 35 and under 20 years of age.. Another factor is regional inequalities in living conditions, especially in access to maternal and child health, contribute to LBW(33).

Study in India demonstrated that age less than 20 year mothers were 3 times LBW than age 20-29 (34) But, maternal baseline characteristics such as level of education, monthly household income, did not have an association with adverse pregnancy outcomes(24).

Case control study in Iran show that sex, living location and mother's age did not differ between the LBW and the control groups (35)Case control Study in Nepal showed that mothers whose age less than 20 years of age were nearly two times more likely to deliver LBW babies compared to mothers of 20-30 age categories. (36).

Matched case control Study conducted in Malaysia Younger mothers had nearly three times the odds to have LBW baby as compared to older mothers (28).

Systemic review of LBW show that the following factors were shown to have a significant association with the risk of having an LBW infant in developing countries: maternal age of 35 to 49 years. Illiteracy, and being in the poorest socioeconomic stratum. Mothers with advanced age (35 to 49 years) had a significantly greater risk of delivering LBW babies than younger mothers Illiterate mothers (no formal education) had a higher risk of delivering LBW babies than more highly educated mothers in Armenia, Indonesia, Jordan, Nepal), Pakistan and Uganda (31).

Study conducted in sub-Saharan countries Mothers aged <16 years showed higher risk for the delivery of a low birth weight infant. In a sub analysis restricted to prim parous women, preterm delivery: low birth weight at delivery very young maternal age (<16 years) was the variable with the highest risk for the delivery of a low birth weight infant, 16%)compared to adult mothers aged 20 to 30 years, 9% (37).

Study in morocco statistical association between the LBW and maternal age (35 years and over). In contrast to other studies Standard of living of families did not have any effect on the LBW.(38).

A review of low birth weight in Ethiopia, Socio-demographic (maternal education level, occupation, income and place of residence are the common risk factors for low birth weight in Ethiopia. Deprived socio-economic status can increase the incidence of LBW. Maternal literacy level, paternal educational status and presence/absence of radio/television in the household were predictors of LBW. low birth weight was more common among children of the youngest mothers, age less than 20 and older mothers, age 35-49 and monthly income <26 United States Dollar (USD), lack of formal education and being merchant were associated with LBW(29)(39).

In contrast to other studies unmatched case control Study in Amhara regional state revealed socio demographic characteristics of the mothers not determinants of LBW. Such as, place of residence, educational status of the mothers have not significantly associated with low birth weight.(40),

Another Facility-based unmatched case-control study conducted among deliveries that took place at Debreberhan Referral Hospital show, mothers of age 15-24 significantly determinant of LBW (41).

Case control study in debremarkos referral hospital shows that monthly income of less than 1500ETB determinant of LBW(42). Similar Studies in Tigray shows Mothers who delivered at the hospital at the age of less than 20 years were 1.7 more likely to deliver LBW babies than mothers aged 20–34 years is significantly associated with LBW (43).

Another study in wolaita sodo revealed that Women who were, housewives had a higher risk of having term low birth weight newborns. In contrast to other studies there is a lesser odds of those from rural settings to have low birth weight newborns as compared to their counter urban equivalents(44).

Recent study in north showa zone, central Ethiopia Mothers with no formal education had two times increased odds of delivering LBW babies than women with formal education. Non-married women had higher odds of giving LBW newborns as compared to married ones(45).

Study in Jimma show that 65 percent of the mothers attending the maternity facilities to be of rural residence. Those mothers residing in urban areas had high proportion of delivering LBW babies compared to rural mothers and the differences were statistically significant. (46).

Case control study in kembata public health facilities this area shows that factors such as urban rural difference, maternal occupational and educational status; religion and marital status of the mothers, were not found statistically associated with term low birth weight. (47).

Medical and obstetric factors

Case control study conducted in Nepal revealed that mothers who had history of premature delivery were five times more likely to deliver as compared to those who do not have history of premature delivery (36).

Matched case control design conducted in Malaysia showed that mother with previous history of LBW infants were 3.7 times more likely to deliver LBW infant as compared to their counterparts and mothers who had current hypertension were 4.5 times more likely to deliver LBW baby as compared to those mother who don’t have current hypertension(28).

Another Study in china LBW was found to be associated with previous histories of adverse pregnancies, and with pregnancy comorbidities and complications, such as hypertensive disorders during pregnancy, anemia, and gestational diabetes.(48).

Study in India history of previous preterm delivery, gestational hypertension, with LBW. But, other maternal baseline characteristics such as, parity index did not have an association with adverse pregnancy outcomes(LBW)(24).

study in Denmark shows hypertension in LBW mothers was 1.24 compared to those with birth weight >2500 g neonate's mothers.(49).

Systemic review show that factors association with the risk of having a LBW infant in developing countries inadequate antenatal care (ANC), delayed conception, are determinants of LBW. delayed conception (over 48 months) had significant relationship with LBW in Armenia, Cambodia, Colombia, Jordan, Tanzania, and Uganda, In all countries, ANC visits were associated with significant reductions in LBW, while receiving inadequate ANC was associated with an elevated risk of LBW (50).

Study in sub-Saharan countries factors significantly associated with increased risk for low birth weight were country, trimester of first antenatal visit, parity(37).

Study in morocco shows that the risk of LBW was high among women who had over three pregnancies. The maternal morbidities during pregnancy are undeniably associated with LBW (Hypertensive Pregnancy: HP, Anemia). The findings show that the number of the antenatal consultation (ANC) reduces the risk of having LBW. Finally, unwanted pregnancies are significantly associated with LBW. Morbidities during pregnancy, the relationship between spouses contribute to LBW. The number of ANC is a protective factor(38).

Review maternal/obstetric (antenatal care visit, and parity), obstetric and medical disorders during pregnancy (hypertensive disorders of pregnancy,) are the common risk factors for low birth weight in Ethiopia. LBW is highly associated with hypertensive disorders of pregnancy (HDP) because these multi organ disorders can cause intrauterine growth restriction (IUGR). Presence of any medical illnesses, being HIV positive risk factors for LBW. In Ethiopia, different studies showed that, obstetric characteristics of mothers play a role on occurrence of LBW. Prim parity, and lack/infrequent of antenatal care follow-up were factors associated with LBW. Other maternal factors inter-pregnancy interval <2 years were predictors of LBW. Unwanted pregnancy as risk factor for LBW(39).

Case control study conducted Amhara regional state shows that the odds of low birth weight was also higher among mothers who didn't attend ANC as compared to mothers who attended ANC follow up during pregnancy (40).

Facility based case control Study in debretabor shows hospital mode of delivery, maternal history of chronic diabetes mellitus, was found to be independent predictors of low birth weight. On the other hand maternal history of chronic diabetes had preventive effect of low birth weight(41).

Case control study in debremarkos referral hospital shows that Primigavida mothers were about five times more likely to give low LBW than multi parous mothers., Mothers who have hypertensive disorder

during pregnancy were about six times more likely to give LBW baby than those who have no hypertensive disorder of pregnancy Mothers who had three or less visit were about five times more likely to give LBW than who had four and more visits(42).

Study in Dangla shows that women who had previous history of low birth weight had 3.2 times higher odds ratio of delivered low birth weight baby than their counterparts, ,So Previous history of low birth weight was independent predictors of low birth weight (51).another Study conducted in Adwa Mothers who wanted the pregnancy were 97% less likely to have LBW babies when compared to those mothers who had unwanted pregnancy. Mothers who had history of abortion were 2.4 times more likely to have LBW babies than those with no history of abortion. Mothers who were reactive for HIV were seven times more likely to have LBW babies than nonreactive mothers(43).

Study in kersa woreda LBW is significantly associated with not attending ANC, (52).

Unmatched case control study in north showa zone show that mothers who had the recommended four or more antenatal care (ANC) visits, those who were not booked had three times increased odds of giving to LBW baby(45).

Nutritional related factors

Case control study conducted in Nepal revealed that mothers lack of consumption of nutritious food during pregnancy increases the risk of delivering low birth baby as compared to those who ate nutritious food during pregnancy (36).

Study in sub-Saharan countries factors significantly associated with increased risk for low birth weight was MUAC(37).

Study in morocco shows that the risk of LBW was high among women with stature less than 150 cm give birth to LBW neonates significantly associated with LBW(38).

Systemic Review about low birth weight in Ethiopia shows that maternal weight and stature, are the common risk factors for low birth weight in Ethiopia. LBW is highly associated with short maternal stature, maternal thinness, Maternal Mid Upper Arm Circumference (MUAC) were factors associated with LBW. Additionally, LBW was significantly associated with anemia during pregnancy Micronutrient and folic acid supplementation during pregnancy were associated with increased birth weight(39).

Case control study conducted Amhara regional state shows The odds of low birth weight was higher among mothers who did not take iron supplementation as compared to mothers who took iron supplementation during the current pregnancy. Mothers who had MUAC below 23 cm(40).

Case control study Debretabour show that hemoglobin levels were found to be the significant predictors of low birth weight. The odds of giving birth of LBW baby were found to be 10 times higher among women with hemoglobin level of < 11 mg/dl compared with counterparts(53).

Case control study in debremarkos referral hospital shows that the proportion of Hgb <11 mg/dl was higher among cases than controls. Mothers with Hgb <11 mg/dl were about three times more likely to give LBW baby than their counter parts and Mothers who had three or less times a day meal were about two and half times more likely to deliver LBW baby than those who had four and above meals per day(40).

Case control Study Dangla shows that women who did not have additional food intake had 5.0 times higher odds ratio of delivered low birth weight neonates than those who had additional food intake during the current pregnancy, additional food intake during the last pregnancy were independent predictors of low birth weight (51).

Study conducted in Adwa revealed that Mothers who had normal hemoglobin status were 98% less likely to give birth to LBW babies than those who had abnormal hemoglobin status and Mothers who took iron with folic acid were 99% less likely to have LBW babies than those who did not take iron and folic acid (43).

Facility based case control study in nekemtie town showed that lack of maternal iron and folic acid supplementation during pregnancy, lack of nutritional counselling during the current pregnancy, not taking snacks, maternal under nutrition(MUAC less than 23cm) and maternal anemia were positively associated with low birthweight.(54).

Study in **kersa woreda** show that LBW was significantly associated with poverty ,maternal Mid Upper Arm Circumference (MUAC) less than 23 cm., longer time to walk to health facility are determinants of low birth weight(52).

study in wolaita shows that not frequently consuming fruits during had a higher risk of having term low birth weight newborns (44).

Unmatched case control study in north showa zone Mothers with no history of nutrition counseling during pregnancy had three times increased odds of giving LBW babies than those who were counseled and Mothers from food insecure households had about four times higher odds of LBW as compared to food secure mothers(45).

Case control study in kembata tembaro zone public health facility shows that those neonates whose mothers didn't have additional food were more than 5 times more likely at risk for term LBW than those neonates' mothers who had additional food during the pregnancy. Regarding iron folate supplementation

during pregnancy, shows that neonates' mothers who didn't receive iron folate were more than eight times at higher risk for term LBW than neonates' mothers who had received iron folate. Mothers from Household food insecurity, Neonates from food insecure households had more than six times higher risk of LBW at term than neonates from food secured households.The mothers who have anemia were more than three times more likely to give low birth weight than non-anemic mothers(47).

Maternal Behavioral related factors

The adverse effects of maternal smoking for human pregnancy are well known. Use of smoking during pregnancy is associated with pregnancy complication and Low birth weight. Maternal smoking reduces mean birth weight by about 150-200 gm and doubles the risk of LBW associated with restriction of intra uterine growth (16).

A systemic review of determinants of LBW highlighted cigarette smoking, alcohol consumption, tobacco chewing were as predictors of LBW in developing countries(55).

Frequency of intake of alcoholic beverages seemed to influence birth weight only in pregnant women who took the drinks on regular basis(56).

Systemic Review about low birth weight in Ethiopia shows that maternal History of khat chewing was associated with low birth weight.(39).

A study conducted in Bale zone Hospitals showed that mothers who had history of Khat chewing were statistically higher at risk to deliver LBW as compared to mothers who didn't chew Khat(57).

Infant related factors

Determinants of LBW in 10 developing countries Female babies were more prone to have a LBW than male babies in Armenia Cambodia ,Colombia Indonesia ,Jordan and Tanzania as well as in all countries overall.(31).

In contrast to other Study in morocco The proportion of LBW in boys (12.37%) and girls (12.21%) showed no significant differences(38).

Fetal factors like infant sex are the common risk factors for low birth weight in Ethiopia. Female sex of a newborn as risk factor for LBW.(39).similarly Unmatched case control study in Amhara regional state the odds of low birth weight was higher among female neonates as compared to their male counterparts.(40).

In contrast to other studies, study conducted in debretabor show that there is no significant association between sex of the new born and LBW (53).

Study conducted in Debreberhan show that Preterm birth) Babies who were born preterm (premature babies)were five times more likely to have low birth weight as compared to those born at their full term (41)another Study conducted in Dangla also shows that pregnant women who delivered before 37 weeks of gestational age had 2.14 times higher odds ratio of delivered LBW neonates than those delivered at term (51).

Study in kembata tembaro public health facilities show that the sex of a newborn being female is more than two times more likely to cause LBW than being male.(58).

Environmental related factors

Various household environmental factors have been implicated in adverse pregnancy out comes, such as LBW. case control study conducted in bale showed that mothers who use kerosene for cooking were 9 times had low birth weight than mothers who had not use kerosene and mothers who wash hands with water only had 2 times LBW baby than mothers who wash hands with water and soap and mothers who had not having separate kitchen room were 2.6 times had low birth baby than mothers who had separate kitchen(29).

CONCEPTUAL FRAME WORK.

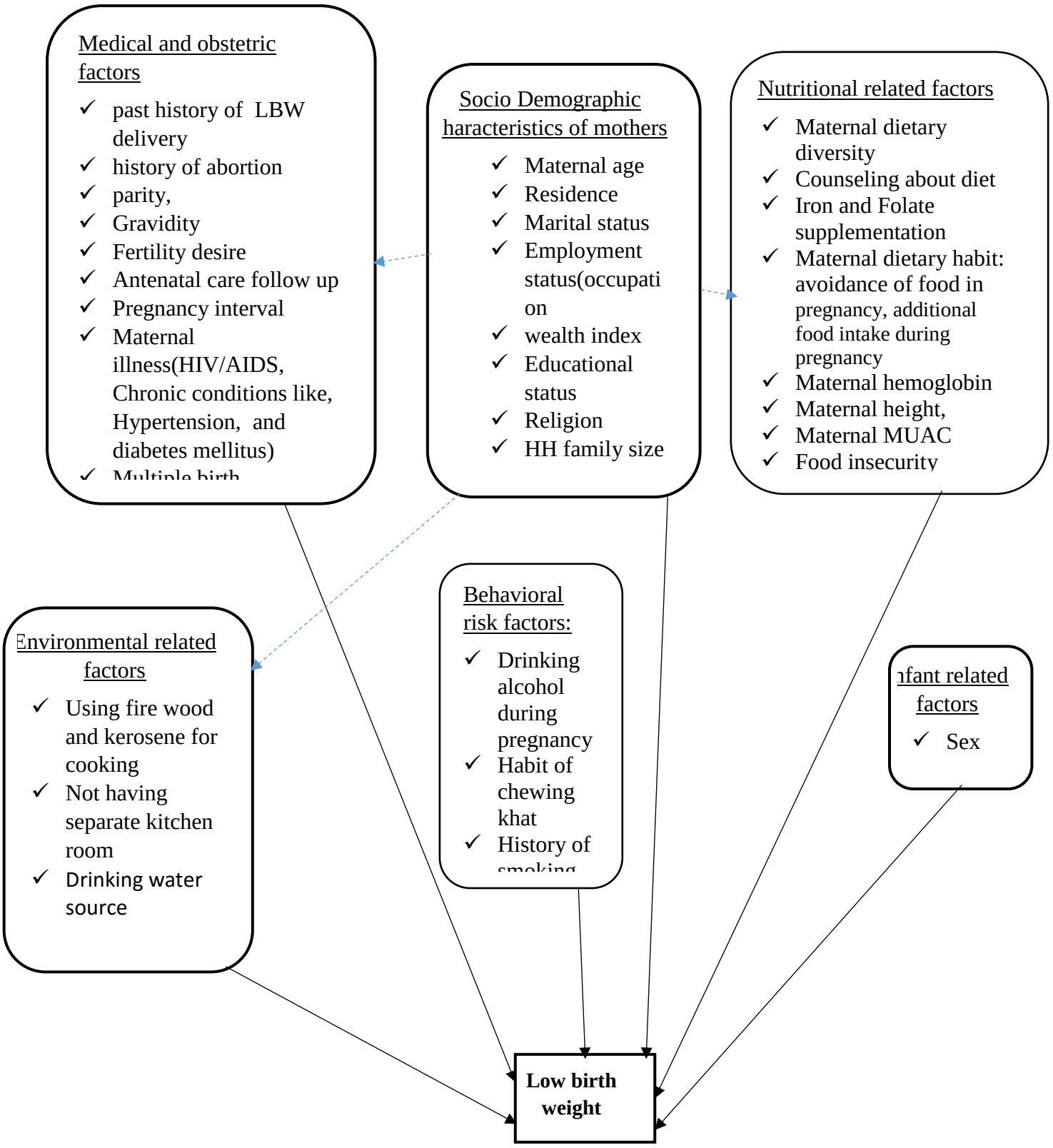

Figure 1Conceptual framework adapted from literatures to assess determinants of low birth weight among new born in Silte zone, public health facilities, south Ethiopia 2020.

(Endalamaw A et al., 2018; Rajashree K et al., 2015**)**

1.3 Significance of the study

Birth weight is a good summary measure of multifaceted public health problems that include long-term maternal malnutrition, ill health, and a poor health care during pregnancy and low birth weight. Maternal nutrition has a critical role in the reduction of both maternal morbidity and mortality as well as the new born health status. Women´s nutritional status is most vulnerable during pregnancy. maternal malnutrition becomes a cycle when malnourished mothers give birth to low birth weight infants who in turn become malnourished mothers themselves(28). Inspite of the fact that there were many studies on determinants of low birth weight in developing countries, Few studies have been conducted regarding the maternal nutritional status and maternal dietary diversity, the environmental related factors with regard to the incidence of low birth weight in Ethiopia(29) no study is done in the study area to the knowledge of the investigator about determinants of low birth weight .therefore this study aims to fulfill this gaps by assessing determinants of low birth weight by using unmatched case control study design, so the finding of this study can help as an input to policy makers (program planner) at different level and NGO working on maternal and child health as well as for health care providers to design appropriate interventions, for ongoing monitoring and analysis of the effectiveness of interventions. In addition it may be helpful in providing information as baseline for future studies. the study may specifically help Silte zone health department , stakeholders and other concerned organizations in the setting to design and take appropriate measures towards the initiation of a suitable nutrition and health promotion programs for pregnant women, which contribute its great share for decreasing the prevalence of LBW neonates.

CHAPTER

3; THREE OBJECTIVE

To identify determinant factors of low birth weight among children, delivered in silte zone public health facilities.

Alternative Hypothesis: -

- The odds of not taking iron folate supplementation are more likely to be among low birth weight neonates' mothers as compared to normal birth weight neonates' mothers.
- The odds of house hold food insecurity status are more likely to be among low birth weight neonates' mothers compared to normal birth weight neonates' mothers.
- The odds of inadequate minimum dietary diversity are more likely to be among low birth weight neonates' mothers as compared to normal birth weight neonates' mothers.

CHAPTER FOUR;

5; METHODS AND MATERIALS

4.1 Study area and period

Silte zone has total population of 1,731,806 from which 949753 females. The reproductive age group were 256721, Expected pregnancies were 76924, under five children 171992.The zone has 224858 households, there are 34 urban and 142 rural health posts with 82 and 163 health extension workers respectively, 37 health centers all gives delivery services and four public hospitals all have Neonatal intensive care unit which admits and treats LBW newborns. The average time takes to reach the health facility is 1 hour and 30 minute. The zone has 30 functional. Regarding to delivery services the zone has achieved 81% skill attendant delivery services (Zone achievements report 2019). The study period was from March 15 to June 16, 2020.

4.2 Study design

Facility based unmatched case control study design was employed

4.3 Source population

All neonates delivered in public health facilities of Silte zone.

4.4 Study population and study unit

Cases: Neonates delivered with low birth weight of <2500gm in Silte zone public health facilities during the study period.

Controls: Neonates delivered with normal birth weight of ≥2500mg in Silte zone public health facilities during the study period.

4.5 Eligibility criteria for cases and controls

4.5.1 Inclusion criteria for cases

For cases: live born singleton baby with birth weight less than 2500gm at birth during the study period

For control: live born, singleton baby with birth weight 2500gm or more at birth during the study period

4.5.2 Exclusion criteria for both cases and controls

Neonates whose mother mentally ill, critically ill/ unable to communicate, placenta previa, abruptio placenta were excluded.

4.6 Sample size determination

The sample size was determined considering a proportional difference approach for case-control study using EpiInfo version 7 statistical software package taking into account the following exposure variables for low birth weight; maternal height, no dietary counseling, no additional food, food insecurity, birth interval, no iron tab given and maternal nutritional status as determined by MUAC.

By using a formula for two population proportions and calculate by Epi info version 7 statistical software package by considering that the percent of controls exposed Height ≤ 1.5M among the controls is 6%(main exposure variable)(59). Assuming a 13.1% difference in cases, proportion of cases with exposure becomes 19.1%. Adjusted Odds Ratio of 4.12 to be detected. By considering 95% confidence level , 80% power of the study and control to case ratio of 2:1 is assumed to estimate a required sample size.

Accordingly, after adding 5% for non-response rate 85 cases and 170 controls (a total sample size of 255) were involved in the study.

Table 1Sample size determination using different exposure variables to study predictors of low birth weight in silte zone public health facilities, southern Ethiopia, 2020

Predictors	CI	OR	Power	Proportion of exposure among case (p_1)	Proportion of exposure among control (P_0)	Case	Control	N total	Reference
No iron tab given	95%	2.82	80%	34	15	70	139	209	(40)
No dietary counseling	95%	2.37	80%	74	45	73	146	218	(59)
Food insecurity	95%	6.74	80%	84	38	19	37	56	(47)
No Additional food	95%	5.49	80%	75	27	21	42	63	(47)
Height <1.5m	95%	4.12	80%	15	6	81	161	242	(60)
Birth interval <=2	95%	3.2	80%	49	25	43	86	129	(29)
MUAC≤ 22cm	95%	2.9	80%	32	12	76	152	228	(59)

4.7 Sampling procedure

Totally there are 41 Public health facilities 4 hospitals and 37 health centers are found in Silte zone which gives delivery service. By taking 30% of the 41 health facilities by simple random sampling technique, 3 hospitals and 10 health centers were selected. Then proportional allocation of newborns to each hospital and health center determined based on the proportion of number of deliveries of one month data last year (data from Megabit 21 to Miazia 20, 2011) in each selected health facilities. The cases and controls were defined according to the birth weight in the labor rooms of the facilities. Consecutive live births of less than 2500 grams in each hospitals and health centers were selected as cases and two normal birth weight babies succeeding each case were selected as controls during the study period.

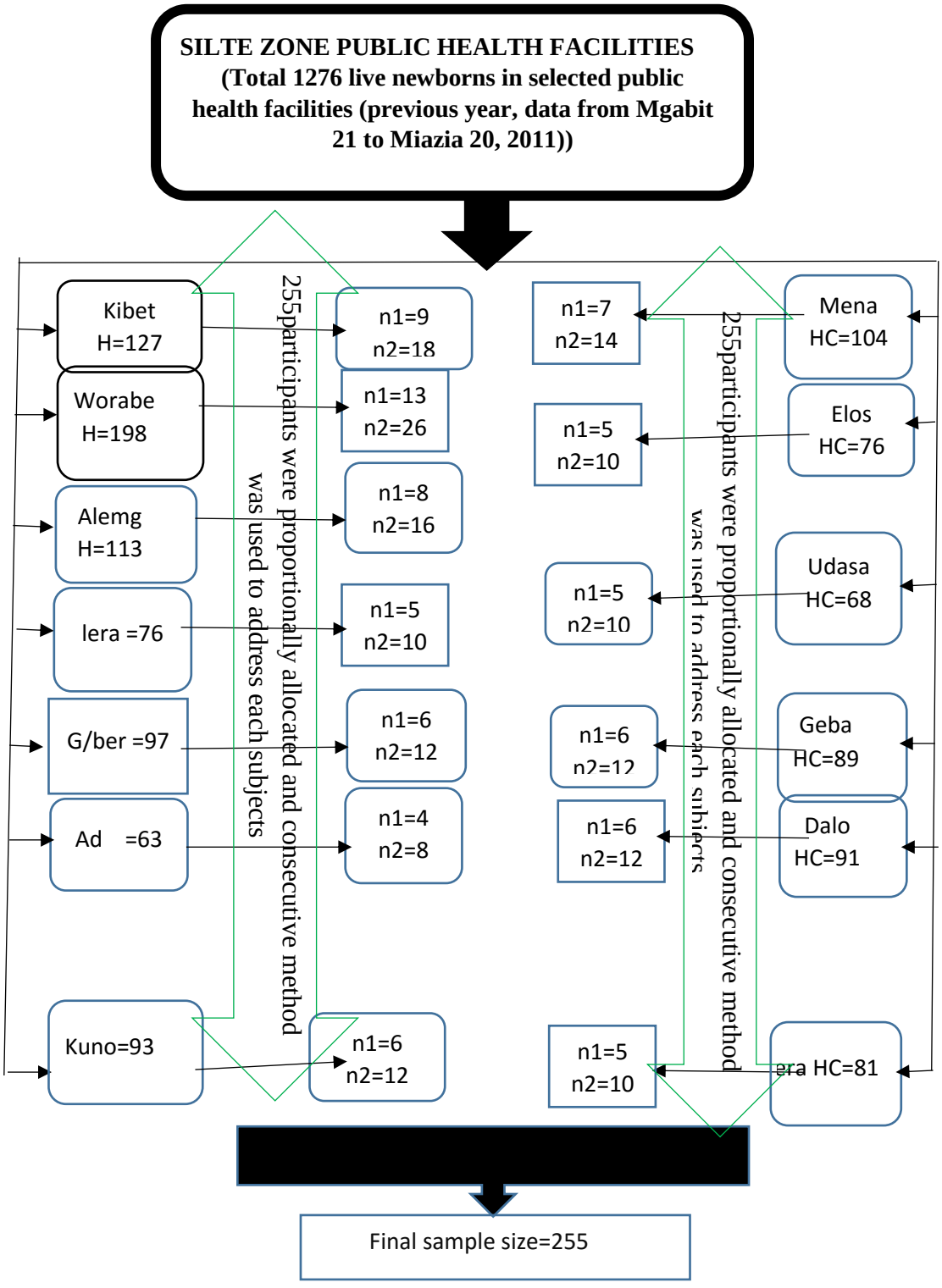

Figure 2; Schematic presentation of sampling procedure, Silte zone public health facilities, South Ethiopia, 2020

4 8 Study variables

4.8.1, Dependent variables

- ✓ Low birth weight

4.8.2, Independent variables

- ✓ Socio demographic and socio-economic factors: maternal age, wealth index, residence, occupation, marital status, education level, religion, house hold size.
- ✓ Medical and obstetrics factors: Gravidity, Parity, Birth interval, pregnancy desire, number of ANC follow up during current pregnancy, history of maternal illness (HIV/AIDS, . hypertension) , bad obstetric history(previous history of low birth weight , history of abortion).
- ✓ Nutritional factors: maternal dietary diversity, food insecurity, maternal MUAC, maternal height, iron and folate supplementation, hemoglobin level, counseling about diet, maternal dietary habit: food preference and food taboo in pregnancy, additional food intake.
- ✓ Behavioral factors: alcohol consumption, khat chewing habit and smoking during pregnancy.
- ✓ Environmental factors: drinking water source, latrine availability, using of kerosene/wood (method of cooking), separate kitchen.
- ✓ Infant factor: infant sex

4.9 Operational and Standard definitions

Low birth weight: - neonate birth weight less than 2,500 gm (up to and including 2,499 gm **)**(61)

Case: those newborns who have birth weight less than 2500 gm at birth

Control: those newborns whose birth weight greater than or equal to 2500 gm at birth

Gravidity: number of pregnancy (62)

Parity: number of live births (62)

Term baby: a baby delivered after 37 completed weeks and before 42 weeks(62)

Pre term baby: a baby delivered after 28 completed weeks and before 37weeks(62)

Intrauterine growth restriction (IUGR): describe a fetus that has not reached its growth potential because of genetic or environmental factor (63)

Abortion: a fetus born before 28 week of gestation (64)

Alcohol use: those mothers who were drank any type of alcohol at least once per week during the index pregnancy. (61)

Previous history of delivery of LBW: babies were only subjectively assessed from the mothers speaking of "small or very small baby".

Multiple births: It refers when more than one fetus is carried to term in a single pregnancy (65)

Adequate Minimum Dietary Diversity-Women: - proportion of women who received foods from five or more food groups of the ten food groups(66)

Inadequate Minimum Dietary Diversity-Women: - proportion of women who received foods from five or more food groups of the ten food group). (66)

Additional food: having at least one additional meal than regular due to pregnancy.

Khat use – Khat chewer pregnant woman was defined as pregnant women who chew Khat at least twice a week, for at least one year including the time of current pregnancy(67).

The Wealth Index- is a composite measure of the cumulative living standard of a household. The wealth index was calculated using easy-to-collect data on a household's ownership of selected assets, such as ownership of television, radio, and materials used for housing construction and types of water access and sanitation facilities. It was generated with a statistical procedure known as principal components analysis; the Wealth Index places individual households on a continuous scale of relative wealth which was categorized in to 3 wealth quintiles(14).

Household food security: exists when all households did not have anxiety and uncertainty about the household's food supply or worried rarely and no problem of insufficient quality and insufficient food intake and its physical consequences(68)

Mild food insecurity: worries about not having enough food sometimes or often, and/or is unable to eat preferred foods, and/or eats a more monotonous Diet than desired and/or some foods considered undesirable, but only rarely(68).

Moderate food insecurity: household sacrifices quality more frequently, by eating a monotonous diet or undesirable foods sometimes or often, and/or has started to cut back on quantity by reducing the size of meals or number of meals, rarely or sometimes(68).

Severe food insecurity: households has graduated to cutting back on meal size or number of meals often, and/or experiences any of the three most severe conditions (running out of food, going to bed hungry, or going a whole day and night without eating), even as infrequently as rarely(68).

Household food insecurity: having anxiety and uncertainty about the household's food supply or worried sometimes or often or households experience problems of insufficient quality of food or insufficient food intake or its physical consequences (68)

4.10, Data collection tools and procedures

Interviewer administered semi structured and pretested questionnaire adapted from different related literatures were used to collect data by face to face interview. The questionnaire was designed to capture the dietary, food security related, iron -folate, behavioral, socioeconomic, environmental, medical and obstetric and infant related factors associated with low birth weight from the participant. Iron and folate supplementation along with history of ANC were asked for each mother. In addition to the questionnaire, hemoglobin level of each mother were taken from the card as hemoglobin is routinely done for each mother receiving delivery service in each public service to determine anemia.

Data were collected by 13 midwiferies and supervised by four health Officers.

Food insecurity

The HFIAS questions were used which is validated for developing country Questions relate to three different domains of food insecurity. i. Anxiety and uncertainty about the household food supply ii. Insufficient quality (includes variety and preferences of the type of food) iii Insufficient food intake and its physical consequences. Each question was asked with a recall period of four weeks (30 days). The respondent were first asked an occurrence question that is, whether the condition in the question happened at all in the past four weeks (yes or no). If the respondent answers “yes” to an occurrence question, a frequency-of-occurrence question were asked to determine whether the condition happened rarely (once or twice), sometimes (three to ten times) or often (more than ten times) in the past four weeks.

Anthropometric Measurements

Anthropometric measurements were done using standardized techniques. Before the real anthropometric data collection, (we took four (4) mothers height and MUAC,four(4)newborn weight and then calculated coefficient variation of height,MUAC and weight were 1.6%,2.7% and 1% respectively) a standardization exercise was performed during the training to capture technical error of measurement (TEM).

The weight of the newborns was measured within one hour upon delivery using a salter scale (Germany brand). Weight scale was calibrated at 0 with no object on it and placed on level surface before measurement carry out. Every morning and when the instruments move apart, calibration and validation were checked the scales by 2kg metal iron sheet to keep their reliability. The height of mother was

measured using a height board. The height of the mother was measured using standard procedure (bare foot, Frankfurt position, ankle, buttock and shoulder touching the height board) in standing position using height measuring board Stadiometer to the nearest 0.1 cm. The mid-upper arm circumference (MUAC) of the mother was measured right after delivery using flexible non-stretchable standard tape measure in cm. The circumference was measured at the mid-point between the tip of the acromion process of the scapula and olecranon process of the ulna. For left-handed women, the right arm was used instead. Measurement was taken while the arm was hanging down at the side and relaxed to the nearest 0.1cm.

. Dietary Assessment

MDD-W were collected using 24-hour recall method by MDD-W (66). Briefly, the pregnant women were asked to recall the foods they had consumed in the previous 24 h(sunrise to sunrise), first spontaneously followed by probes to ascertain that no meal or snack were left out. A detailed list of all the ingredients of the dishes, snacks, or other foods consumed were generated to enable better classification of mixed dishes. The foods were then categorized into 10 food groups.

4.11 Data quality control

Before data collection the questionnaire was translated by language expert from English version to Amharic language and siltigna language and back translated to English language by different translators to keep the consistency of the questionnaire. Two day training were given prior to actual data collection by the principal investigator to supervisors and data collectors about the objective of the study, how to supervise and collect anthropometric measurement data and the interview questionnaire. The instrument was pretested on 5% of the actual sample in non selected hospital (tora primary hospital) with similar socioeconomic status with the study population before actual data collection and correction were taken accordingly. Weight scale was placed in level surface before measurement was carried out. Every morning and when the instruments move apart, calibration and validation were checked the scales by 2kg metal iron sheet. During data collection questionnaires were checked for completeness on daily basis by data collectors and supervisors.

4.12, Data processing and analysis

After the data collection, the data were checked manually for its completeness every day, edited, coded, entered in to Epi data version 3.1 and finally exported to SPSS version 20 and checked for missing values before analysis. A pregnant women was assigned in the inadequate minimum dietary diversity if the score is <5 and adequate if the score is >=5. Principal Component Analysis was employed for wealth index and all assumptions like sample size, ratio of variables to cases, the variables included were dichotomous, measure of sampling adequacy (KMO and Anti-Image ≥0.5), Bartlett test of sphericity is statistically significant(P<0.05), and no complex structure were seen and explained variation also satisfied.. Frequency distribution were done to check for outliers, inconsistencies and to identify missing values. Descriptive statistics such as frequencies, percentage, summary measures, tables and graphs were used to describe the results of the respondents. Bivariate logistic regression analysis was fitted for each exposure variable with the dependent variable to identify candidates for multivariate logistic regression. Variables with p -value < 0.25 were entered to the multivariate logistic regression. Adjusted odds ratio (AOR) with 95% CI and p value were used to measure strength of association with low birth weight. Variables with P value <0.05 were declared significant. Moreover, presence of multicollinearity was checked by employing parameter of variance inflation factor (VIF) > 10. Finally, Model fitness was checked by using Hosmer Lemshow test with p value = 0.518.

4.12 Ethical consideration

Ethical clearance was obtained from research and ethics committee of Jimma university institute of health ethics review board. A support letter was obtained from Silte zone health department. The necessary permission was obtained from each woreda health office, Hospital and health center authorities. Informed verbal consent was obtained from the study participants after explaining the purpose of the study. Coding and aggregate reporting were used to eliminate names and other personal identification of respondents throughout the study process to ensure anonymity, private and confidentiality.

4.13 Dissemination of the finding

The finding of the study may be presented to Jimma University, institute of health, faculty of public health, department of Nutrition and Dietetics. Furthermore, the finding of the study may disseminated for the Silte zone health department, respective woreda health office and respective hospitals and health centers. The findings may also be disseminated to different stakeholders that have a contribution to improve low birth weight. Finally, it may be presented in different symposium & published in reputable journals

Chapter five

Result

5.1 Sociodemographic characteristics

From a total of 255 sample size, 252 mothers of (84 cases and 168 controls) were included in the interviews which made the response rate of 98.8% for both cases and controls. The mean ± sd of birth weight was 2154.94gm ± 233.43 for cases and 3022.92gm ± 311.88 for controls. A higher proportion of newborns were females both in cases and controls that account for 57.1% and 54.8%, respectively. The mean ± sd of maternal age among the cases was 28.4 ± 8.6 years and it was27.72 ± 6.403 years among controls. The majority, 72.6%, of mothers among the controls and 67.9% among cases were in the age group of 21–35 years. The largest proportion, 96.4% vs. 92.9%, of mothers among cases and controls were Silte, while 98.8% of mothers among cases and 94% among controls were Muslim in religion. About 79.8% of mothers of LBW babies had not formal education and 61.3 % among the mothers of normal birth weight (NBW) babies are not formal education. Overall, most of the mothers in both cases and control groups were married (96.4% and 94.6%, respectively). Moreover, 71.4% of mothers among cases and 69.6% among controls were living in rural setting. The higher number of mothers in both case and control group were housewife, (76.2% and 65.5%, respectively) followed by merchant (11.9% and 20.2%, respectively) .regarding to household family size 33.3% among cases and 25.6% among controls have family size of >=5. A detail of socio-economic and demographic characteristics is presented below in table2

Table 2;Distribution of socio-economic and demographic characteristics among mothers of LBW case and NBW controls in Silte zone public health facilities, southern Ethiopia, 2020

Variables		**Cases no. (%)**	**Controls no. (%)**	**Total N (%)**
Infant sex	Male	36(42.9)	76 (45.2)	112 (55.6)
	Female	48(57.1)	92 (54.8)	140 (44.4)
Maternal age	<=20	15(17.9)	22(13.1)	37(14.7)
	21-35	57(67.9)	122(72.6)	179(71)
	>35	29(14.3)	24(14.3)	36(14.3)
Religion	Muslim	83(98.8)	158(94)	241(95.6)
	Orthodox	1(1.2)	6(3.6)	7(2.8)
	Protestant	-	2(1.2)	2(0.8)
	Others	-	2(1.2)	2(0.8)

Ethnicity	Silte	81(96.4)	156(92.9)	237(94)
	Gurage	3(3.6)	7(4.2)	10(4)
	Hadiya	-	2(1.2)	2(0.8)
	Amhara	-	2(1.2)	2(0.8)
	Oromo	-	1(0.6)	1(0.4)
Residence	Rural	60(71.4)	117(69.6)	177(70.2)
	Urban	24(28.6)	51(30.4)	75(29.8)
Marital status	Married	81(96.4)	159(94.6)	240(95.2)
	Divorced	1(1.2)	4(2.4)	5(2)
	Widowed	2(2.4)	5(3)	7(2.8)
Educational status	Not formal education	67(79.8)	103(61.3)	170(67.5)
	Formal education	17(20.2)	65(38.7)	82(32.5)
Occupation of the mothers	Government employed	5(6)	12(7.1)	17(6.7)
	Private employed	4(4.8)	11(6.5)	15(6)
	Merchant	10(11.9)	34(20.2)	44(17.5)
	Housewife	64(76.2)	110(65.5)	174(69)
	Other	1(1.2)	1(0.6)	2(0.8)
HH family size	>=5	28(33.3)	43(25.6)	71(28.2)
	<5	56(66.7)	125(74.4)	181(71.8)
Wealth index	Lower	45(53.6)	96(57.1)	141(56)
	Middle	31(35.7)	51(30.4)	81(32.1)
	Upper	9(10.7)	21(12.5)	30(11.9)

Medical, obstetric and infant related characteristics

Proportions of antenatal care follow up among cases and controls were 61.9% and 92.3%respectively and 43.1%among cases and 10.6% among control had ANC follow up of <4 times. Mothers who described their pregnancy as unplanned but wanted were 26.2 % and 20.8% among cases and controls, respectively. Maternal chronic hypertensive disease among cases was 2.4%while controls had 3%. Few mothers among cases and controls, reactive for HIV test. History abortion was observed among 20.2%% of mothers in cases and 23.8% of mothers in controls. Majority of mothers both in cases and controls were multigravida (73.8% and 69%) respectively. pre term delivery was observed among 13.1% of mothers in cases and 9.5% of controls. Majority of mothers in both cases and controls were multipara which accounts 67.1% and 60.3%respectively.regarding to birth interval 30.6% among cases and 28.4% among controls had birth interval of <=2 years. Mother who chew khat always, usually, sometimes among cases were 9.5%,15.5%,6% respectively and 3.6%,12%, 4% respectively among controls while few mothers both

among cases and control were sometimes drunk alcohol. The distribution of infant, medical and obstetrics characteristics presented in table 3 below.

Table 3; Distribution of infant, medical and obstetrics characteristics among mothers, of LBW cases and NBW controls in Silte zone public health facilities, southern Ethiopia, 2020

Variables	**Category**	**Cases no. (%)**	**Controls no. (%)**	**Total N (%)**
Gravidity	Primigavida	22(26.2)	52(31)	74(29.4)
	multigravida	62(73.8)	116(69)	178(70.6)
Parity	Primipara	24(32.9)	46(39.7)	70(37)
	Multipara	49(67.1)	70(60.3)	119(63)
Hx abortion	Yes	17(20.2)	40(23.8)	57(22.6)
	No	67(79.8)	128(76.2)	195(77.4)
Hx Pre term delivery	Yes	11(13.1)	16(9.5)	27(10.7)
	No	73(86.9)	152(90.5)	225(89.3)
Birth interval	<=2years	19(30.6)	33(28.4)	52(29.2)
	>2years	43(69.4)	83(71.6)	126(70.8)
Type of pregnancy	Planned	62(73.8)	133(79.2)	195(77.4)
	Unplanned	22(26.2)	35(20.8)	57(22.6)
Attend ANC	Yes	52(61.9)	155(92.3)	207(82.1)
	No	32(38.1)	13(7.7)	45(17.9)
Frequency ANC	>=4times	37(56.9)	135(89.4)	172(79.6)
	<4times	28(43.1)	16(10.6)	44(20.4)
Chronic HTN	Yes	2(2.4)	5(3)	7(2.8)
	No	82(92.9)	163(98.8)	245(97.2)
HIV status	Reactive	2(2.4)	6(3.6)	8(3.2)
	Non-reactive	82(97.6)	162(96.4)	244(96.8)
chew khat	No	58(69)	135(80.4)	193(76.6)
	Always	8(9.5)	6(3.6)	14(5.6)
	Usually	13(15.5)	20(12)	33(13.1)
	Sometimes	5(6)	7(4)	12(4.7)
drink alcohol	No	83(98.8)	164(97.6)	247(98)
	Sometimes	1(1.2)	4(2.4)	5(2)

Nutritional and Anthropometric Related Factors

The mean ± SD of maternal height for cases and controls was 1.588(0.09), 1.63(0.07) meters respectively. Proportion of mothers who did not take additional food in cases were 79.8% while, 38.7% among controls were did not take additional foods during pregnancy. Mothers with a height of less than 150cm were 25% among cases and 4.8% among controls. Undernutrition in mothers as defined by MUAC < 23cm was 26.2% and 10.7% among cases and controls respectively. Mothers who had not received iron and folate supplementation during pregnancy were 36.9% and 9.5% among cases and controls respectively. Mothers who did not counseling about diet were 76.2% and 39.3% among cases and controls respectively. Proportion of maternal hemoglobin <11mgdl among cases were 33.3% while in controls it was 7.7% The largest proportion of mothers 92.9% among cases and 62.5% of mothers among controls had inadequate MDD-W. A detail of Nutritional and Anthropometric characteristics is presented below in table 4.

Table 4: Nutritional and anthropometric characteristics among mothers, of LBW cases and NBW controls in Silte zone public health facilities, southern Ethiopia, 2020

Variables	catagory	Cases no. (%)	Controls no. (%)	Total N (%)
Additional food	Yes	17(20.2)	103(61.3)	120(47.6)
	No	67(79.8)	65(38.7)	132(52.4)
Food avoidance	Yes	21(25)	39(23.2)	60(23.8)
	No	63(75)	129(76.8)	192(76.2)
Fasting	Yes	21(25)	39(23.2)	60(23.8)
	No	63(75)	129(76.8)	192(76.2)
MDD W	Inadequate	78(92.9)	105(62.5)	183(72.6)
	Adequate	6(7.1)	63(37.5)	69(27.4)
Eating out of home	Yes	12(14.3)	22(13.1)	34(13.5)
	No	72(85.7)	146(86.9)	218(86.5)
Food insecurity	Yes	68(81)	61(36.3)	129(51.2)
	No	16(19)	107(63.7)	123(48.2)
Counseling about diet	Yes	20(23.8)	102(60.7)	122(48.4)
	No	64(76.2)	66(39.3)	130(51.6)
Maternal hemoglobin	<11	28(33.3)	11(7.7)	39(15.5)
	>=11	56(66.7)	157(92.3)	213(84.4)
Maternal height	<=1.5m	23(27.4)	8(4.8)	31(12.3)
	>1.5m	61(72.6)	160(95.2)	221(87.7)

Maternal MUAC	<23cm	22(26.2)	18(10.7)	40(15.9)
	>=23cm	62(73.8)	150(89.3)	212(84.1)
Iron folate	Yes	53(63.1)	157(93.5)	210(83.3)
	No	31(36.9)	11(6.5)	42(16.7)

Environmental related factors

Mothers who delivered low birth weight baby had not separate kitchen, it was around 40.5% and mothers who had not separate kitchen among controls was 44%. Most of the mothers were using firewood for cooking among both cases and controls (65.4% and 60.7%) respectively. Detail of environmental characteristics are presented in table 5.

Table 5;Environmental related characteristics among mothers, of LBW cases and NBW controls in Silte zone public health facilities, southern Ethiopia, 2020.

Variables		Cases no. (%)	Controls no. (%)	Total N (%)
Hand washing	Yes	75(89.3)	162(96.4)	237(94)
	No	9(10.7)	6(3.6)	15(6)
Source of drinking water	Protected	77(91.7)	151(89.9)	228(90.5)
	Unprotected	7(8.3)	17(10.1)	24(9.5)
Time take to fetch water	Less than an hour	36(42.9)	102(60.7)	138(54.8)
	One hour or more	43(51.2)	55(32.7)	98(38.9)
	Water on premises	5(6)	11(6.5)	16(6.3)
Solid waste disposal	Collected by municipality	4(4.8)	12(7.1)	16(6.3)
	Buried	1(1.2)	24(14.3)	25(9.9)
	Collected by private establishment	17(20.2)	1(0.6)	18(7.1)
	Dumped in street/open space	60(71.4)	49(29.2)	109(43.3)
	Disposed in the compound	2(2.4)	25(14.9)	27(10.7)
	Dumped in river	0	57(33.9)	57(22.6)
	Burned			
	Other(specify)			
Availability of latrine	Yes	79(94)	154(91.7)	233(92.5)
	No	5(6)	14(8.3)	19(7.5)
Hand washing	Water with soap	32(49.2)	110(65.5)	142(60.9)
	Water with ash	10(15.4)	26(15.5)	36(15.5)
	Water only	23(35.4)	32(19)	55(23.6)
Separate kitchen room	Yes	50(59.5)	94(56)	144(57.1)
	No	34(40.5)	74(44)	108(42.9)
Source energy for cooking	Electricity	12(14.3)	39(23.2)	51(20.2)
	Kerosene	12(14.3)	20(11.9)	32(12.7)
	Firewood	55(65.4)	102(60.7)	157(62.3)
	other	5(6)	7(4.2)	12(4.8)

Determinants of low birth weight

In bivariate logistic regression analyses performed to identify candidate variables for multivariable logistic regression model in identifying determinants of low birth weight, all variables having p-value less than 0.25 were considered for the final multivariable logistic regression model

Table 6; Bivariate analyses of socio demographic factors to identify candidate variables for multivariable logistic regression to identify determinants of LBW, Silte zone Southern, Ethiopia, 2020.

Variables	Category	**Cases** no (%)	**Control** no (%)	**Total N (%)**	**COR in 95% CI**	**P Value**
Infant sex	Male	36(42.9)	76 (45.2)	112 (55.6)	0.908(0.535,1.54)	0.720
	Female	48(57.1)	92 (54.8)	140 (44.4)	1	
Maternal age	<=20	15(17.9)	22(13.1)	37(14.7)	1.459(0.705,3.021)	0.309
	21-35	57(67.9)	122(72.6)	179(71)	1	
	>35	29(14.3)	24(14.3)	36(14.3)	4.547(0.500,2.291)	0.861
Residence	Rural	60(71.4)	117(69.6)	177(70.2)	1	
	Urban	24(28.6)	51(30.4)	75(29.8)	0.667(0.516,1.633)	0.77
Educational status	No formal education	67(79.8)	103(61.3)	170(67.5)	2.487(1.343,4.606)	0.004
	Formal education	17(20.2)	65(38.7)	82(32.5)	1	
Occupation of the mothers	Government employed	5(6)	12(7.1)	17(6.7)	1	
	Private employed	4(4.8)	11(6.5)	15(6)	0.873(0.186,4.106)	0.863
	Merchant	10(11.9)	34(20.2)	44(17.5)	0.706(0.2,2.487)	0.588
	Housewife	64(76.2)	110(65.5)	174(69)	1.396(0.471,4.144)	0.547
	Other	1(1.2)	1(0.6)	2(0.8)	2.4(0.124,46.391)	0.562
HH family size	>=5	28(33.3)	43(25.6)	71(28.2)	0.667(0.376,1.182)	0.199
	<5	56(66.7)	125(74.4)	181(71.8)	1	
Wealth index	Lower	45(53.6)	96(57.1)	141(56)	1.094(0.464,2.578)	0.838
	Middle	31(35.7)	51(30.4)	81(32.1)	3.464(0.557,3.382)	0.491
	Upper	9(10.7)	21(12.5)	30(11.9)	1	

Table 7; Bivariate analyses of medical, obstetric and behavioural factors to identify candidate variables for multivariable logistic regression to identify determinants of LBW, Silte zone Southern, Ethiopia, 2020.

Variables	Category	**Cases**	**Control**	**Total N (%)**	**COR in 95% CI**	**P Value**
		no (%)	no (%)			
Gravidity	Primigavida	22(26.2)	52(31)	74(29.4)	0.792(0.44,1.422)	0.434
	multigravida	62(73.8)	116(69)	178(70.6)	1	
Parity	Primipara	24(32.9)	46(39.7)	70(37)	0.745(0.403,1.377)	0.348
	Multipara	49(67.1)	70(60.3)	119(63)	1	
Hx abortion	Yes	17(20.2)	40(23.8)	57(22.6)	0.812(0.428,1.540)	0.523
	No	67(79.8)	128(76.2)	195(77.4)	1	
Hx Pre term delivery	Yes	11(13.1)	16(9.5)	27(10.7)	0.389(0.309,1.587)	0.389
	No	73(86.9)	152(90.5)	225(89.3)	1	
Birth interval	<=2years	19(30.6)	33(28.4)	52(29.2)	1.111(0.566,2.180)	0.759
	>2years	43(69.4)	83(71.6)	126(70.8)	1	
Type of pregnancy	Planned	62(73.8)	133(79.2)	195(77.4)	1	
	Unplanned	22(26.2)	35(20.8)	57(22.6)	1.348(0.731,2.488)	0.339
Chronic HTN	Yes	2(2.4)	5(3)	7(2.8)	0.659(0.13,3.335)	0.614
	No	82(92.9)	163(98.8)	245(97.2)	1	
HIV status	Reactive	2(2.4)	6(3.6)	8(3.2)	0.659(0.130,3.335)	0.614
	Non-reactive	82(97.6)	162(96.4)	244(96.8)	1	
chew khat	No	58(69)	135(80.4)	193(76.6)	1	
	Always	8(9.5)	6(3.6)	14(5.6)	1.867(0.392,8.894)	0.433
	Usually	13(15.5)	20(12)	33(13.1)	0.910(0.237,3.487)	0.891
	sometimes	5(6)	7(4)	12(4.7)	0.566(0.127,2.58)	0.491

Table 8; Bivariate analyses of Nutritional factors to identify candidate variables for multivariable logistic regression to identify determinants of LBW, Silte zone Southern, Ethiopia, 2020.

Variables	Category	**Cases**	**Control**	**Total N (%)**	**COR in 95% CI**	**P Value**
		no (%)	no (%)			
Additional food	Yes	17(20.2)	103(61.3)	120(47.6)	1	
	No	67(79.8)	65(38.7)	132(52.4)	6.245(3.372,11.565)	<001
Food avoidance	Yes	21(25)	39(23.2)	60(23.8)	1.113(0.600,2.029)	0.756
	No	63(75)	129(76.8)	192(76.2)		
Fasting	Yes	21(25)	39(23.2)	60(23.8)	1.103(0.599,2.029)	0.754
	No	63(75)	129(76.8)	192(76.2)	1	
MDD W	Inadequate	78(92.9)	105(62.5)	183(72.6)	7.800(3.212,18.94)	<001
	adequate	6(7.1)	63(37.5)	69(27.4)	1	
Eating out of home	Yes	12(14.3)	22(13.1)	34(13.5)	1.106(0.518,2.360)	0.871
	No	72(85.7)	146(86.9)	218(86.5)	1	
Food insecurity	Yes	68(81)	61(36.3)	129(51.2)	7.455(3.975,13.981)	<001
	No	16(19)	107(63.7)	123(48.2)	1	
Counseling about diet	Yes	20(23.8)	102(60.7)	122(48.4)	1	
	No	64(76.2)	66(39.3)	130(51.6)	4.945(2.742,8.920)	<001
Maternal hemoglobin	<11	28(33.3)	11(7.7)	39(15.5)	7.136(3.333,15.278)	<0.001
	>=11	56(66.7)	157(92.3)	213(84.4)	1	
Maternal height	<=1.5m	23(27.4)	8(4.8)	31(12.3)	7.541(3.201,17.764)	<001
	>1.5m	61(72.6)	160(95.2)	221(87.7)	1	
Maternal MUAC	<23cm	22(26.2)	18(10.7)	40(15.9)	2.957(1.484,5.893)	002
	>=23cm	62(73.8)	150(89.3)	212(84.1)	1	
Iron folate	Yes	53(63.1)	157(93.5)	210(83.3)	1	
	No	31(36.9)	11(6.5)	42(16.7)	8.348(3.924,17.762)	<0.001

Table 9; Bivariate analyses of Environmental factors to identify candidate variables for multivariable logistic regression to identify determinants of LBW, Silte zone Southern, Ethiopia, 2020.

Variables	Category	**Cases**	**Control**	**Total N (%)**	**COR in 95% CI**	**P Value**
		no (%)	no (%)			
Separate kitchen room	Yes	50(59.5)	94(56)	144(57.1)	0.864(0.508,1.470)	0.589
	No	34(40.5)	74(44)	108(42.9)	1	
Source energy for cooking	Electricity	12(14.3)	39(23.2)	51(20.2)	1	
	Kerosene	12(14.3)	20(11.9)	32(12.7)	1.95(0.743,5.117)	0.395
	Firewood	55(65.4)	102(60.7)	157(62.3)	1.752(0.848,3.620)	0.275
	Other	5(6)	7(4.2)	12(4.8)	2.321(0.622,8.668)	0.210
Time take to fetch water	Less than an hour	36(42.9)	102(60.7)	138(54.8)	0.776(0.253,2.388)	0.659
	One hour or more	43(51.2)	55(32.7)	98(38.9)	1.720(0.556,5.324)	o.347
	Water on premises	5(6)	11(6.5)	16(6.3)	1	

After entering each explanatory variables in to bivariate analysis, educational status of the mother (not read and write), Household family size >=5, house hold food in security, Not ANC visits, Not additional food, MDD-W score <5, Not Iron folate supplementation during pregnancy, Height of the mother <1.5m, MUAC of the mothers <23cm, Not counseling about diet and hemoglobin <11g/dl become statically significant with low birth weight at p value <0.25 in 95%CI.

Multivariate logistic regression

The selected independent covariates with p-value < 0.25 in bivariate logistic regression were entered into the multivariable logistic regression model to isolate the independent predictors of LBW using backward elimination stepwise likelihood ratio method. After entering all Candidate variables in to multivariable analysis only household food insecurity, Hemoglobin of the mother, additional meal during pregnancy, Minimum dietary diversity score of women, Iron supplementation were significantly associated with LBW.

When food secured households Compared to food in secured households, Neonates from food in secured households mother had more than six times at risks of LBW (AOR= 6.853; 95%CI; (3.008, 15.613) than neonates from food secured women. Also those neonates whose mothers hadn't additional

food were more than three times (AOR= 3.096; 95%CI; (1.278, 7.502) more likely at risk for LBW than those neonates‟ mothers who had additional food during pregnancy. When we see iron folate supplementation during pregnancy neonates‟ Mothers Who didn't receive Iron folate during pregnancy were more than four times at risk for term LBW than neonates‟ mothers who had received iron folate. (AOR=4.175; 95%CI (1.437, 12.300). the odds of LBW babies among mothers with inadequate MDD-W were higher than mothers with adequate MDD-W (AOR=4.131(CI ;(1.403, 12.158). Mothers whose hemoglobin less than 11 were 5.213 times more likely to have low birthweight neonate (AOR = 5.213 (CI ;(1.923, 14.130) than mother whose hemoglobin were greater than 11.

Table 10;Determinants of LBW In multivariable logistic regression analysis for newborns delivered in Silte zone public health facilities, southern Ethiopia, 2020.

Variables	Category	Cases	Controls	COR(95% CI)	AOR(95%CI)	P value
Additional food	Yes	17(20.2)	103(61.3)	1	1	
	No	67(79.8)	65(38.7)	6.245(3.372,11.565)	3.096(1.278,7.502)	0.012
Iron folate received	Yes	53(63.1)	157(93.5)	1	1	
	No	31(36.9)	11(6.5)	8.348(3.924,17.762)	4.175(1.437,12.130)	0.009
Hemoglobin	<11	28(33.3)	11(7.7)	7.136(3.333,15.278)	5.213(1.923,14.130)	0.001
	>=11	56(66.7)	157(92.3)	1	1	
MDD-W	Adequate	6(7.1)	63(37.5)	1	1	
	Inadequate	78(92.9)	105(62.5)	7.800(3.212,18.94)	4.131(1.403,12.158)	0.01
Food insecurity	Yes	68(81)	61(36.3)	7.455(3.975,13.981)	6.853(3.008, 15.613)	<0.001
	No	16(19)	107(63.7)	1	1	

Chapter six Discussion

The present study revealed that the risk of low birth weight was higher among mothers who didn't receive additional food during current pregnancy as compared to mothers who did receive additional food during current pregnancy. Nutrition and weight management before and during pregnancy has a profound effect on development of infants. This is a critical time for healthy fetal development as infants rely heavily on maternal stores and nutrients for optimal growth and health outcomes in later in life. Mothers should consumed more food (increased food intake compare to preconception period) during pregnancy period this findings were consistent with other similar studies done in Jimma, Kembata, Dangla, Amhara regional state, Nepal.(56,46, 50, 40,36).

Intake of iron and folate supplements during pregnancy had significant association with LBW. Mothers who did not take iron and folate supplementation were more likely to deliver low birth weight babies than mothers who did take iron and folate supplementation during pregnancy. Women can develop iron deficiency anemia from the loss of blood during menstruation and from repeated pregnancies; it can also be caused by lack of iron in the diet. During pregnancy, women may develop anemia because the growing fetus draws upon the mother's iron for the development of red blood cells and other tissues. Intake of iron supplements during pregnancy was also found to have a protective effect with respect to term LBW. Randomized controlled trial in USA shows that iron folate supplementation significantly lower incidence of low-birth-weight infants that is 4% in treatment group 17%; in placebo group, P = 0.003(69). Mothers who took iron with folic acid were 99% less likely to have LBW babies than those who did not take iron and folic acid (43). This finding is inline with a study done in Adwa, Amhara regional state, Kembata, nekemtie (43, 40, 46, and 53).

Mothers having inadequate MDD-W had significantly higher odds of giving birth to LBW babies. Inadequate women dietary diversity during pregnancy independently and significantly affected low birth weight in the study. The consequences of inadequate nutritional intake during pregnancy not only directly affects women's health status, but may also have a negative impact on birth weight and early development. Mothers having inadequate MDD-W had significantly higher odds of giving birth to LBW babies. This finding was consistent with a study done in Oromia region and study done in wolaita, in Ethiopia, in which women in the inadequate MDD-W group had an increased risk of LBW and PTB compared with women in the adequate MDD-W group (15, 44). Similarly, a study from Ghana shows that Women dietary diversity score and dietary patterns were found to be protective against low birth weight (40).However, a recent randomized controlled trial in India reported that an intervention that increased consumption of dairy, fruits, and green leafy vegetables before and during pregnancy

through a specially formulated snack had no effect on birth weight (24). This difference might be due to differences in study population, geographical location and the study design.

The significant association between houses holds food insecurity of the mother was significantly associated with term low birth weight. The odd of term LBW was 6.853 times higher among mothers from food insecured households as compared to secured households with corresponding 95% CI of (3.008,15.613).This finding is in line with a case control study finding in Iran and finding in kembata tembaro [35, 46]. This finding is further supported by Prospective cohort study in Pakistan which shows food insecurity in pregnancy is associated with low birth weight in neonates, Food insecured women had a 5.439 times increased risk of delivering a low birth weight neonate (RR=5.439, CI=1.710-17.296, p=0.002(70).Possible explanation for the significant association between food insecurity and low birth weight may be food insecurity reduces the quality and quantity of food available to mothers, limited diversified food, reducing weight gain and impair the nutritional status of the mother which subsequently reduces weight at birth. Food in secured mothers may often restrict their food and scarify their own nutrition in order to protect their children from hunger which in turn impairs the nutritional status of the mother and consequently reduces weight at birth. Other possible explanation may be women from food in secured households may be at risk of depression and stress which are potential determinants of term LBW as documented in some studies.

This study showed that mothers who's hemoglobin <11mg/dl were higher odds to deliver LBW neonates compared to mothers who's hemoglobin >=11mg/dl. This finding is consistent with other studies done in Nepal, Malaysia, India (28, 34,36) and studies in Ethiopia Adwa, Debretabor and Debremarkos(40,43,52) Study conducted in Adwa revealed that Mothers who had normal hemoglobin status were 98% less likely to give birth to LBW babies than those who had abnormal hemoglobin status.

Socio economic and sociodemographic factors such as urban rural difference, Wealth index, House hold family size, maternal occupational and educational status; religion and marital status of the mothers were not found statistically associated with term low birth weight

A finding of this study is also in line with studies India, morocco (24, 38) and different studies Conducted in Ethiopia (40, and 52). In contrary to this, a study finding in Germany, show that women with a lower secondary school certificate were 2.6 times more likely to have a child with LBW than those with university/ technological college entrance certificate (32). Study in Iran Standard of living of families did not have any effect on the LBW.(38). Study in Adwa general hospital shows Mothers who delivered at the hospital at the age of less than 20 years were 1.7 more likely to deliver LBW babies than mothers aged

20–34 years is significantly associated with LBW (43). These differences may be due to sample size, Geographical location or study methods followed.

In this Study maternal illnesses (HIV/AIDS, hypertension, UTI), maternal behavioral factors were not significantly associated with term LBW .Which is not in line with different studies. Such as; maternal exposure to Hypertension, urinary tract infection and HIV/AIDS during pregnancy were also reported as risk factor for low birth weight (24,28,36,38, 48) This difference may be owing to the fewer number of cases and controls exposed as observed in the result section. This sample may be insufficient to detect the existing exposure difference between cases and controls which in turn result insignificant association between medical factors with term LBW.

Strength and limitation of the study

The present study has strength; taking new born weight within one hour of delivery can be considered as a major strengths of this study..

However the study has limitations: private health facilities were not included in this study. The completed gestational age was taken from verbal response of respondents. There might be recall bias as respondents had to remember their last date of menstruation. There might be chances of recall bias as this study sought some data based on respondents past history like dietary diversity, number of ANC visit, number of iron tablet taken.But, efforts were made to minimize these biases by remmemebering mothers to recall last menstrual period by local calender method.

Chapter seven

Conclusion

Not taking additional diet during pregnancy, no iron folate supplementation, no dietary diversity, house hold food insecurity and hemoglobin of <11 mg/dl were significantly associated with term Low birth weight. Therefore, the key elements iron intake, additional food, dietary diversity which are likely to improve low birth weight need to be addressed in this study setup. It was also found that low birth weight at term was strongly associated with house hold food insecurity.

Generally, this Implies that low birth weight remains global challenging public health problem.

7.2; **Recommendations**

For health facilities

- Identification of women at risk of malnutrition (such as poor and food in secure women)

Provision of nutritional support (in the form of food supplements, micronutrient Supplements) during pregnancy.

- Health service providers should focus on health information related to nutrition diversification and balanced diet.
- Provision of daily iron intake and reinforcing women not to withdraw the recommended iron intake.
- Regular assessment of Iron-Folate adherence

For government officials and policy makers

- Design strategies to decrease house hold food in security and supplementation of additional food for food in secured pregnant mothers.
- Strengthening interventions on intergenerational malnutrition

For researchers

❖ Additional research such as large scale (community based with large sample size), strong designed study (prospective cohort or experimental study) including depression status of the mother need to be conducted

References

1. United Nations Children's Fund (UNICEF), World Health Organization (WHO). UNICEF-WHO Low birthweight estimates: Levels and trends 2000–2015. Geneva: World Health Organization; 2019 Licence: CC BY-NC-SA 3.0 IGO. 2015;
2. Norris T, Johnson W, Farrar D, Tuffnell D, Wright J, Cameron N. Small-for-gestational age and large-for- gestational age thresholds to predict infants at risk of adverse delivery and neonatal outcomes : are current charts adequate ? An observational study from the Born in Bradford cohort. BMJ Open. 2015;5(1):1–11.
3. Unterscheider J, Donoghue KO, Daly S, Geary MP, Kennelly MM, Mcauliffe FM, et al. Fetal growth restriction and the risk of perinatal mortality – case studies from the multicentre PORTO study. BMC Pregnancy Childbirth [Internet]. 2014;14(1):1–6. Available from: BMC Pregnancy and Childbirth
4. Very Low and Extremely Low Birthweight Infants. UCSF Med center,Intensive Care Nurs House Staff Man. 2004;65–8.
5. Sharma D, Shastri S, Sharma P. Intrauterine Growth Restriction : Antenatal and Postnatal Aspects. Clin Med insights Pediatr. 2016;10:67–83.
6. Murki S. Intrauterine Growth Retardation - A Review Article. J Neonatal Biol. 2014;03(03):1–11.
7. Daradkeh G, Corporation HM, Musthafa ME, Guizani N. Handbook for Nutritional Assessment through Life Cycle. 2016. 3–75 p.
8. Siza JE. Risk factors associated with low birth weight of neonates among pregnant women attending a referral hospital in northern Tanzania. Tanzan J Health Res. 2008;10(1):1–8.
9. Judith R. Bale, Barbara J. Stoll AOL. Improving Birth Outcomes: Meeting the Challenge in the Developing World [Internet]. 2003. 372 p. Available from: http://www.ncbi.nlm.nih.gov/books/NBK222105/
10. Calkins K, Devaskar SU, Angeles L. Fetal Origins of Adult Disease. Curr Probl Pediatr Adolesc Heal Care. 2015;6(310):3–26.
11. Database OF. CO1 . 3 : Low birth weight Definitions and methodology Key findings Chart CO1 . 3 . A . Low birth weight infants as a proportion of total live births , 2017 or latest available Number of live births weighing less than 2500 grams as a proportion (%) of tot. 2019;(July):1–3.
12. Doherty T, Kinney M. Low birthweight: will new estimates accelerate progress? Lancet Glob Heal [Internet]. 2019;7(7):e809–10. Available from: http://dx.doi.org/10.1016/S2214-109X(19)30041-5

13. United Nations Children's Fund and World Health Organization, Low Birthweight: Country, regional and global estimates. UNICEF, New York, 2004.

14. Ethiopia Demographic and health survey. 2016. 161–162 p.

15. Ethiopia Demographic and Health Survey. 2011;135–7.

16. Ethiopia Demographic and Health Survey. 2005;127–9.

17. Guidelines on Optimal feeding of low birth- weight infants in low-and middle-income countries, World health organization, 2011. 2011;

18. Goldenberg RL, Culhane JF. Low birth weight in the United States. Am J Clin Nutr. 2007;85(2):584–90.

19. Ramakrishnan U. Nutrition and low birth weight: From research to practice. Am J Clin Nutr. 2004;79(1):17–21.

20. Bililign N. A Review of Low Birth Weight in Ethiopia : Socio-Demographic and Obstetric iMedPub Journals A Review of Low Birth Weight in Ethiopia : Socio-Demographic and Obstetric Risk Factors Abstract. 2018;(January):2019–23.

21. Sicuri E, Bardají A, Sigauque B, Maixenchs M, Nhacolo A, Nhalungo D, et al. Costs associated with Low Birth Weight in a rural area of Southern Mozambique. PLoS One. 2011;6(12).

22. Jacob CM, Baird J, Barker M, Cooper C, Hanson M. The Importance of a Life Course Approach to Health: Chronic Disease Risk from Preconception through Adolescence and Adulthood. Who Rep [Internet]. 2017;14(1):1–41. Available from: http://www.who.int/life-course/publications/life-course-approach-to-health.pdf?ua=1

23. Tatiana C, Barreto G. Factors Associated with Low Birth Weight in Indigenous Populations : a systematic review of the world literature. 19(1):7–23.

24. Tellapragada C, Eshwara VK, Bhat P, Acharya S, Kamath A. Risk Factors for Preterm Birth and Low Birth Weight Among Pregnant Indian Women : A Hospital-based Prospective Study. 2016;165–75.

25. Manikkam L, Burns JK. Antenatal depression and its risk factors: An urban prevalence study in KwaZulu-Natal. South African Med J. 2012;102(12):940–4.

26. Asia S. WHA Global Nutrition Targets 2025 : Low Birth Weight Policy Brief. 2012;

27. PROFILE OF PRETERM AND LOW BIRTH WEIGHT PREVENTION AND CARE Newborns in ethiopia. :10–2.

28. Sutan R, Mohtar M, Mahat AN, Tamil AM. Determinant of Low Birth Weight Infants : A Matched Case Control Study. 2014;(March):91–9.

29. Demelash H, Motbainor A, Nigatu D, Gashaw K, Melese A. Risk factors for low birth weight in Bale zone hospitals , South-East Ethiopia : a case – control study. 2015;1–10.

30. Blencowe H, Krasevec J, Onis M De, Black RE, An X, Stevens GA, et al. Articles National , regional , and worldwide estimates of low birthweight in 2015 , with trends from 2000 : a systematic analysis. Lancet Glob Heal [Internet]. 2019;7(7):e849–60. Available from: http://dx.doi.org/10.1016/S2214-109X(18)30565-5

31. Mahumud RA, Sultana M, Sarker AR. Distribution and determinants of low birth weight in developing countries. J Prev Med Public Heal. 2017;50(1):18–28.

32. Bedeutung D. The Relevance of Maternal Socioeconomic Characteristics for Low Birth Weight – a Case-Control Study. 2016;248–54.

33. Rocha-buelvas JGA. Risk factors associated with low birth weight in the Americas : literature review. 2018;66(2):025–6.

34. Ganesh Kumar S, Harsha Kumar HN, Jayaram S, Kotian MS. Determinants of low birth weight: A case control study in a district hospital in Karnataka. Indian J Pediatr. 2010;77(1):87–9.

35. Incidence of Low Birth Weight in Mazandaran Province, Northern Iran DOI 10.5001/omj.2013.09.

36. Sharma SR, Giri S, Timalsina U, Bhandari SS. Low Birth Weight at Term and Its Determinants in a Tertiary Hospital of Nepal : A Case-Control Study. 2015;1–10.

37. Melo ACM. determinants of low birth weight in subsaharan countries. J Chem Inf Model. 2013;53(9):1689–99.

38. Noureddine E, Abdellatif B. Prevalence and Determinants of Low Birth Weight : A Case-Con- trol Study in Marrakesh (Morocco). 2015;44(3):422–4.

39. Bililign N, Legesse M, Akibu M. iMedPub Journals A Review of Low Birth Weight in Ethiopia : Socio-Demographic and Obstetric Risk Factors Abstract Magnitude of low birth weight. 2018;1–5.

40. Asmare G, Berhan N, Berhanu M, Alebel A. Determinants of low birth weight among neonates born in Amhara Regional State Referral Hospitals of Ethiopia : unmatched case control study. BMC Res Notes [Internet]. 2018;1–7. Available from: https://doi.org/10.1186/s13104-018-3568-2

41. Hailu LD, Kebede DL. Determinants of low birth weight among deliveries at a Referral Hospital in Northern Ethiopia. Biomed Res Int. 2018;2018.

42. Gebrehawerya T, Gebreslasie K, Admasu E, Gebremedhin M. Determinants of Low Birth Weight among Mothers Who Gave Birth in Debremarkos Referral Hospital, Debremarkos Town, East Gojam, Amhara Region, Ethiopia. Neonatal Pediatr Med. 2018;04(01):1–6.

43. Gebregzabiherher Y, Haftu A, Weldemariam S, Gebrehiwet H. The Prevalence and Risk Factors for Low Birth Weight among Term Newborns in Adwa General Hospital , Northern Ethiopia. 2017;2017(Figure 1).

44. Kastro S, Demissie T, Yohannes B. Low birth weight among term newborns in Wolaita Sodo town , South Ethiopia : a facility based cross-sectional study. 2018;1–7.

45. Gizaw B, Gebremedhin S. Factors associated with low birthweight in North Shewa zone, Central Ethiopia: Case-control study. Ital J Pediatr. 2018;44(1):1–9.

46. Tema T. PREVALENCE AND DETERMINANTS OF LOW BIRTH WEIGHT IN JIMMA ZONE , SOUTHWEST ETHIOPIA. 2006;83(7):366–71.

47. Etiopija J, Alemu S, Workicho A, Nigatu M. Determinants of low birth weight in public health facilities , of Kambata Tembaro Zone , South Ethiopia zdravstvenim ustanovama zone Kembata Tembaro ,. 2018;648(63):66–74.

48. Chen Y, Li G, Ruan Y, Zou L, Wang X, Zhang W. An epidemiological survey on low birth weight infants in China and analysis of outcomes of full-term low birth weight infants. 2013;(October 2015).

49. Virkus RA, Heitmann B, Obel E, Bergholt T, Løkkegaard E. The relation between birth weight and hypertension . A study among Danish nurses *. 2013;5(4):16–22.

50. Endalamaw A, Engeda EH, Ekubagewargies DT, Belay GM, Tefera MA. Low birth weight and its associated factors in Ethiopia : a systematic review and meta- analysis. 2018;(December).

51. Talie A, Taddele M, Alemayehu M. Magnitude of Low Birth Weight and Associated Factors among Newborns Delivered in Dangla Primary Hospital , Amhara Regional State , Northwest Ethiopia , 2017. 2019;2019.

52. Assefa N, Berhane Y, Worku A. Wealth Status , Mid Upper Arm Circumference (MUAC) and Antenatal Care (ANC) Are Determinants for Low Birth Weight in Kersa , Ethiopia. 2012;7(6).

53. Mekie M, Taklual W. Magnitude of low birth weight and maternal risk factors among women who delivered in Debre Tabor Hospital , Amhara Region , Ethiopia : a facility based cross- sectional study. 2019;1:1–6.

54. Girma S, Fikadu T, Agdew E, Haftu D, Gedamu G, Dewana Z, et al. Factors associated with low

birthweight among newborns delivered at public health facilities of Nekemte town, West Ethiopia: A case control study. BMC Pregnancy Childbirth. 2019;19(1):1–6.

55. Kramer MS. Determinants of low birth weight: Methodological assessment and meta-analysis. Bull World Health Organ. 1987;65(5):663–737.

56. Siza JE. Risk factors associated with low birth weight of neonates among pregnant women attending a referral hospital in northern Tanzania. 2008;10(1):1–8.

57. Belda SS, Gebremariam MB. Birth preparedness, complication readiness and other determinants of place of delivery among mothers in Goba District, Bale Zone, South East Ethiopia. BMC Pregnancy Childbirth [Internet]. 2016;16(1):1–12. Available from: http://dx.doi.org/10.1186/s12884-016-0837-8

58. Alemu A, Abageda M, Assefa B, Melaku G. Low birth weight: Prevalence and associated factors among newborns at hospitals in kambata-tembaro zone, southern Ethiopia 2018. Pan Afr Med J. 2019;34:1–8.

59. Siyoum M, Melese T. Factors associated with low birth weight among babies born at Hawassa University Comprehensive Specialized Hospital, Hawassa, Ethiopia. Ital J Pediatr. 2019;45(1):1–7.

60. Demelash H, Motbainor A, Nigatu D, Gashaw K, Melese A. Risk factors for low birth weight in Bale zone hospitals , South-East Ethiopia : a case – control study. BMC Pregnancy Childbirth [Internet]. 2015;1–10. Available from: http://dx.doi.org/10.1186/s12884-015-0677-y

61. Kolios AGA, French LE, Navarini AA. International Statistical Classification of Diseases and Related Health Problems. 2015;230(4):314–7.

62. The American College of Obstetricians and Gynecologists. Obstetric Data Definitions version 1.0. Revitalize. 2014;1(1):1–5.

63. E.brown J. Nutrition thrugh the life cycle. 2011. 88–146 p.

64. Organization WH. Abortion laws: a survey of current world legislation. 1971;78. Available from: http://pesquisa.bvsalud.org/bvsms/resource/pt/mis-18092

65. American Society for Reproductive Medicine. Multiple pregnancy and birth: Twins, triplets, and high-order multiples. A guide for patients. Patient Inf Ser [Internet]. 2012;1–20. Available from: www.ReproductiveFacts.org

66. Food and Agriculture Organization of the United Nations Rome, 2018.

67. Al-aghbari A, Mustafa M, Nasr AA, Assad A. Journal of Gynecology and Neonatal Biology.

2015;1(2):28–31.

68. Coates J. Household Food Insecurity Access Scale (HFIAS) for Measurement of Food Access: Indicator Guide. 2007;(August).

69. Parvanta I, Yip R. Iron supplementation during pregnancy , anemia , and birth weight : 2014;(October 2003).

70. Saeed A. Effects of Maternal food Insecurity on Birth Weight of Neonates: A Prospective Cohort. 2018;(December 2017).

Annexes

Annex1: English Version Questionnaire

Jimma University, Institute Of Health, Faculty of Public Health, Department Of Nutrition and Dietetics

Hello! My name is……. I am here on behalf of: Shafi Seid student of Jimma University, Institute of Health, Department of Human Nutrition and Dietetics. he is conducting a research for the Partial fulfillment of second degree on „Determinants of LBW among delivered child in silte zone public health facilities, southern Ethiopian‟ ‟The information you provide will help to indicate potential intervention points for stakeholders by identifying major risk factors of LBW. Your name will not be recorded in any part of the questionnaire in order to ensure confidentiality of the information you provide. The study doesn't have any harm to the study mothers and to their child. You may ask us to clarify questions if you do not understand them or can stop the interview at any time.

Are you willing to participate in this study? No (say thank you) Yes (continue interviewing)

To be completed by the interviewer

I certify that I have read the above consent procedure to the participant.

Signed: _____

Name of health facility……..

Name of interviewer_____ signature_____

Name of supervisor _____ signature_____ Date

of interview (Ethiopian calendar) _____/_____/_____

Part A: Socio-demographic and socio-economic characteristics of the mother

Q.no.	Questions	Choices for response	Skip
A01	Questionnaire with name of health facility & ID Number of study subjects **(to be numbered before interview)**	Name of Health Facility_____ Mather's full name_____ ID Number a newborn _____ Kebele_____ Zone_____ Gote_____	
A02	Age of the mother	Age in years_____	
A043	Religion of the mother	1. Muslim 2. Orthodox 3. Protestant 4. Other	
A04	Ethnicity of the mother	1. Silte 2. Amhara 3. Oromo 4. Gurage 5. Other	
A05	Educational status of the mother	1. Not read and write 2. Read and write only 3. Primary education 4. Secondary school 5. Collage and above	

A06	Educational status of husband	1. Not Read and Write 2. Read and Write only 3. Primary education 4. Secondary school 5. Collage and above	
A07	Residence of the mother?	1. Rural 2. Urban	
A08	Current marital status of the mother	1. Married 2. Single 3. Divorced 4. Widowed	
A09	Current occupation of the mother	1. Student 2. Government employed 3. Private employee 4. Merchant 5. House wife 6. Day laborer 7. Farmer 8. Others (Specify)	
A10	Current occupation of husband	1. Student 2. Government employed 3. Private employee 4. Merchant 5. Farmer 6. Day laborer 7. Others (Specify)	
A11	Your household family size	Number_____	
A12	Head of your household	Wife ……..…..01 Husband …….……02	
A13	Matrimonial status of husband	Monogamist……..01 Polygamist…….02	

Part B: wealth index

Now I will ask you about some fixed assets that your household has.

Q.no.	Questions	Yes	No
	Does the household have any of the following properties? (Circle)		
B01	Has household access to electricity?	1	0
B02	Functioning Television	1	0
B03	Watch/clock	1	0

B04	Refrigerator	1	0
B05	Radio	1	0
B06	Mobile telephone	1	0
B07	Non-mobile telephone	1	0
B08	Table	1	0
B09	Chair	1	0
B10	Bed with cotton/sponge/spring mattress	1	0
B11	Electric mitad	1	0
B12	Kerosene lamp/pressure lamp	1	0
B13	Bicycle	1	0
B14	Motor cycle/ Bajaj	1	0
B15	Car	1	0
B16	Animal-drawn cart	1	0
B17	Tanker truck	1	0
B18	Cart with small tank	1	0
B19	Water pump	1	0
B20	Piped water	1	0
B21	Piped into dwelling	1	0
B22	Piped to yard/plot	1	0
B23	Public tap/standpipe	1	0
B24	Borehole	1	0
B25	Dug well	1	0
B25	Water from spring	1	0
B27	Rainfall water	1	0
B28	Surface water	1	0
B29	River/Lake/Pond/Stream/Dam	1	0
B30	Bottled water	1	0
B31	Has household toilet facility?	1	0
B32	Do you share this toilet facility with other households?	1	0
B33	Does any member of this household own any agricultural land?	1	0

B34	Does any member of this household have a bank or microfinance saving account?	1		0
	Does the household have any of the following animals? (Circle)	yes	No	How many?
B35	Oxen	1	0	
B36	Cows	1	0	
B37	Horse/mules	1	0	
B38	Goats/Sheep	1	0	
B39	Chickens	1	0	
B40	Donkey	1	0	

Part C: New born characteristics

Q.no.	Questions	Choices for response	
C01	Sex of the newborn?	Male _____ 1 Female _____2	
C02	Gestational age of the new born	1 , greater than 37 weeks 2, less than 37 weeks	
C03	Birth length of the newborn?	Birth length in cm: L1_____L2._____L3_____	
C04	Birth order of the newborn	Number_____	

Part D: Maternal medical and obstetrics factors

Q.no.	Questions	Choices for response	Skip
D01	What is gravidity of the mother?	Gravidity: _____	
D02	What is parity of the mother? That is any delivery that passed 28 weeks of gestation.	Parity: _____	If she was Gravida-I skip to D03
D03	Was there any history of abortion?	1. Yes 2. No 3. Don't know	If answer is "No" skip to QD05
D04	Total number of abortion	……	
D05	Was there any history of preterm delivery (≤37wk)?	1. Yes 2. No 3. Don't know	
D06	When did your last menstrual period starts? (Gestational age)	Gestational age at delivery in weeks: _____	
D07	Birth interval(if any preceding birth)	----------	
D08	What type of pregnancy is it?	1. Planned and wanted 2. Unplanned but wanted 3. unplanned and unwanted	

D09	Have you ever attended ANC follow up for your current delivery?	1. Yes 2. No 3. Don't know	
D10	At what months of the current pregnancy you started ANC?	At _____ months	
D11	How many times did you have ANC visit for the current pregnancy?	In number------	
D12	During this pregnancy, did you receive any multivitamin tablets or syrups? (Show tablets and syrup). Ask to see the tablets and syrups.	1. Yes 2. No 3. Don't know	
D13	During this pregnancy or any time, were you given an injection in the arm to prevent the baby from getting tetanus that is convulsion after birth?	1. Yes 2. No 3. Don't know	
D15	During this pregnancy, did you take any drug for intestinal worms?[show mebendazole tablets and syrup]	1. Yes 2. No 3. Don't know	
D17	Do you have any chronic medical illness?	1. Yes 2. No 3. Don't know	
D18	Which chronic medical illness (more than one response is possible)	1. Chronic hypertension 2. Diabetes mellitus 3. Pregnancy induced hypertension 4. Others (Specify)	
D19	During your current pregnancy, have you been told that you have developed gestational diabetes mellitus?	1. Yes 2. No 3. Don't know	
D20	During this pregnancy, have you been told that you have developed pregnancy induced hypertension?	1. Yes 2. No 3. Don't know	
D21	HIV status of the mother(PICT)	1. Reactive 2. Non-reactive 3. Don't know	

Part E: Minimum Dietary Diversity-Women

	READ OUT THE LIST Circle "1" for mentioned and "0" for not mentioned **Food categories**	Coding	
E01	Any food made from grains (sorghum, maize, wheat, teff, millet,)…….	1	0
E02	Any other food made from roots or tubers? (potato, sweet potato, cassava, or other local roots or tubers)……..……	1	0
E03	Any food made from pulses (e.g. lentils, beans, soybeans, or peas)…….....	1	0
E04	Any food made from nuts (e.g. peanut better, peanuts)….....	1	0
E05	Any food made with oil, fat or butter…	1	0
E06	Any dairy product (e.g. milk, cheese or yoghurt)……	1	0
E07	Meat (e.g. lamb, beef, veal, goat , liver, brain, all other organ meats like tripe, Offal)…….…….……	1	0
E08	Poultry (e.g. chicken, turkey, duck)…….…….….....	1	0
E09	Fish ……..……..	1	0
E10	Eggs…….....	1	0
E11	Dark green leafy vegetables (Swiss chard, kale, lettuce, spinach)…….....	1	0
E12	Any food made from pumpkins, carrots, cabbage, red sweet potatoes, mango, papaya, bell paper, green ……..……..…….....	1	0

E13	Any other fruits? (e.g., bananas, apples, avocados, fig, grapes, guava, orange, lime….....	1	0
E14	Any other vegetables? (E.g. onion, tomatoes, garlic) …….....	1	0

Part F: Maternal dietary habit

Know I would like to ask you about the habit of your diet during the current pregnancy

Q.no.	Questions	Choices for response	Skip
F01	During the current pregnancy, how many meals do you usually eat within a day?	1. Once 2. Twice 3. Thrice 4. Four times 5. Five times and above	
F02	Have you taken additional food than usual during the current pregnancy?	1. Yes 2. No 3. Don't know	
F03	During the current pregnancy, what is your most typical meal pattern within a day?	1. Breakfast- lunch- dinner 2. Breakfast-snack - lunch- dinner 3. Breakfast- lunch-snack- dinner 4. Breakfast-snack- lunch-snack-dinner 5. Breakfast-snack- lunch-snack-dinner- late night snack	
F04	What was your meal frequency within a day before this pregnancy?	_____ Times.	
F05	During the current pregnancy, did you have any habit of skipping meal?	1. Yes 2. No 3. Don‟t know	If answer is "No/don't know" skip toQ.F07.
F06	If yes to # Q05, what is/are your reason/s to skip your meal?	1. Tiredness 2. Busy at work so I forget 3. Not to increase weight 4. Other (specify)	
F07	Do you fast while you are pregnant?	1. Yes 2. No 3. Don‟t know	
F08	Is there any food item that you avoided after you became pregnant	1. Yes 2. No 3. Don‟t know	If answer is "No/don't know" skip to part F13

F09	If yes to # Q09, which food item did you avoid most?	1. Coffee 2. Porridge, “atmit”, bread, linseed 3. “Shirowot”(other legumes) 4. Key sir, tomato, chilly (other vegetables) 5. Egg, milk and milk products 6. Banana or other fruits 7. Meat 8. Other(specify) _____	
F10	What is/are your reason/s to avoid the above mentioned food item/s?	1. Personal dislike (aversion) 2. not allowed to pregnant women to eat(cultural belief) 3. Religion 4. other, specify	
F11	If personal dislike, what do you think for your dislike?	1. Smell/taste of food is/are the reason/s 2. Heart burn/discomfort 3. Feeling of nausea/vomiting 4. I don’t know the reason	
F12	If cultural belief, what cultural reason/s make the above food items difficult forbidden to eat?	1. Will make baby big &labour 2. Will be plastered on fetal head and body 3. Fear of abortion 4. Evil eye 5. Fetal abnormality 6. Other, specify	
F13	In the last nine months, how often did you eat meals outside of your home?	1. Per day 2. Per week 3. Per month 4. Never 5. Other, specify	
F14	Did you get Counseling about diet During ANC follow up?	1. Yes 2. No	

Part G. Behavioral risk factors

Q.no.	Questions	Choices for response	Skip
G01	During your current pregnancy, have you ever chew Khat?	1. Yes 2. No	

G02	If yes, how frequently you were chewing Khat?	1. Always 2. Usually 3. Some times	
G03	During your current pregnancy, have you ever smoked?	1. Yes 2. No	
G04	If yes, how frequently you were smoking?	1. Always 2. Usually 3. Some times	
G05	During your current pregnancy, have you ever drunk alcohol?	1. Yes 2. No	
G06	If yes, how frequently you were drinking alcohol?	1. Always 2. Usually 3. Some times	

Part H. Environmental factors

Know I would like to ask you about the sources of water and availability of latrine for your household members.

Q.no.	Questions	Choices for response	Skip
H01	What is the main source of drinking water for your household members? Source of drinking water	Piped into dwelling ……01 Public tap/standpipe……02 Tube well/borehole…….....03 Tanker-truck……04 Surface water (river, lake, pond, and irrigation channel…….05 Other (specify)_____ 77	
H02	How long does it take to fetch water? That means get water and come back to your home?	Less than an hour…… ……..…01 One hour or more……..02 Water on premises…….03	
H03	Do you treat your water in any way to make it safer to drink? (Do not include washing water container)	No……...…...00 Yes, always……...01 Yes, sometimes……..…..…02	
H04	What do you usually do to the water to make it safer to drink? Anything else? (More than one answer is possible)	No…….…00 Boil…….01 Add bleach/chlorine/wuha agar……02 Strain it through a cloth……..…….....03 Use water filter (sand, composite, etc).04 Let it stand and settle……....05 Water purifying product…….…….....06 Other (specify)……..…..77	

H05	What kind of toilet facility do members of your household usually use?	Flush to piped sewer system…….….01 Flush to septic tank ……...…02 Flush to pit/latrine.…….03 Flush to somewhere else…….04 Ventilated improved pit/latrine (VIP)…05 Pit/latrine with slap……..….06 Pit/latrine without slap/open pit ……07 Composting toilet……...……08 No facility/bush (field)..……..…09 Other (specify)…. ……..…..…….77 Don‟t know ……..…88	
H06	How does your household primarily dispose of household waste?	Collected by municipality…….……...01 Buried……...……....02 Collected by private establishment.....03 Dumped in street/open space……..…....04 Disposed in the compound……....…..05 Dumped in river…….....06	
		Burned…….....07 Other (specify)…… …….……...77	
H07	Do you wash your hands after coming from the toilet?	No …….00 Yes, usually…….;.....01 Yes, sometimes ……02	
H08	If yes, what do you use when you wash your hands after coming from the toilet? (more than one answer is possible)	Soap……...…….01 Ash…….02 Plant…….....……..……03 None…….…….04 Other, specify……...…….77	
H09	Have you separate kitchen?	No……0 Yes…….1	
H10	What do you use for cooking?	1, Electric 2,kerosene 3,Using fire wood 4,other	

Part I Food insecurity questions

I	**Food insecurity condition**	Response	code	skip
I01	In the past four weeks, did you worry that your **household** would not have enough food? **Probe:** By "household" we mean those of you that sleep under the same roof and take meals together at least four days a week.	Yes No	1 2	If 2
I02	If yes How often did this happen?	Rarely (Once or twice in the past four weeks) Sometimes (3 to 10 times in the past four weeks) Often (more than 10 times in the past four weeks)	1 2 3	
I03	In the past four weeks, were you or any household member not able to eat the **kinds of foods you/he/she preferred** because of a **lack of resources**? **Probe:** By "**kinds of foods you preferred**" we mean foods that food secure people eat that food insecure people cannot afford to eat. E.g. Eggs, Meat, fish, "Doro wot", etc. By "**lack of resources**" we mean not having money or the ability to grow or trade for the food	Yes No	1 2	If 2 to I05

I04	If yes How often did this happen?	Rarely (Once or twice in the past four weeks) Sometimes (3 to 10 times in the past four weeks) Often (more than 10 times in the past four weeks)	1 2 3	
I05	In the past four weeks, did you or any household member have to eat a **limited variety of foods** due to a lack of resources? **Probe:** When we say "**limited variety of foods**", we want to mean an undesired monotonous diet for an extended period of days	Yes No	1 2	If 2 to I07
I06	If yes How often did this happen?	Rarely (Once or twice in the past four weeks) Sometimes (3 to 10 times in the past four weeks) Often (more than 10 times in the past four weeks)	1 2 3	
I07	In the past four weeks, did you or any household member have to eat some **foods that you really did not want to eat** because of a lack of resources to obtain other types of food? **Probe: Foods that you really did not want to eat** is Food that is considered to be undesirable or socially unacceptable.	Yes No	1 2	If 2 I09
I08	If yes How often did this happen?	Rarely (Once or twice in the past four weeks) Sometimes (3 to 10 times in the past four weeks) Often (more than 10 times in the past four weeks)	1 2 3	

I09	In the past four weeks, did you or any household member have to eat a smaller **meal** than you felt you needed because there was not enough food? **Probe:**By "**meal**" we mean the major eating occasions (not including snacks).	Yes No	1 2	

I10	If yes How often did this happen?	Rarely (Once or twice in the past four weeks) Sometimes (3 to 10 times in the past four weeks) Often (more than 10 times in the past four weeks)	1 2 3	
I11	In the past four weeks, did you or any other household member have to eat **fewer meals in a day** because there was not enough food? Probe: "**fewer meals in a day**" than the social norm, eat fewer than three meals in a day.	Yes No	1 2	
I12	If yes How often did this happen?	Rarely Sometimes often	1 2 3	
I13	In the past four weeks, was there ever no food to eat of any kind in your household because of lack of resources to get food?	Yes No	1 2	
I14	If yes How often did this happen?	Rarely Sometimes often	1 2 3	
I15	In the past four weeks, did you or any household member go to sleep at night hungry because there was not enough food?	Yes No	1 2	
I16	If yes How often did this happen?	Rarely Sometimes often	1 2 3	

I17	In the past four weeks, did you or any household member go a whole day and night without eating anything because there was not enough food?	Yes No	1 2	
I18	If yes How often did this happen?	Rarely Sometimes often	1 2 3	

Part J; Iron folate supplementation questions

Q.no	6.Iron folate supplementation	responses	code	skip
J01	During this pregnancy, were you given or did you buy any iron tablets **Probe by telling the color of iron or by showing iron tablet**	Yes No	1 2	If 2
J02	When did you receive the first tablets	1st Trimester 2nd Trimester 3rd trimester	1 2 3	
J03	For how long did you take the supplement?	One month Two months Three months More than three months	1 2 3 4	
J05	How did you take your supplement?	On daily base…… Weekly…… When I think am sick..--- Other(specify	1 2 3 4	
J06	How many tablets did you collect per visit?	30 table…… 60 table…… 90 table…., >90 table…… Other (specify)…….	1 2 3 4 5	
J07	How many tablets per a week you receive	Seven days 4-7 days <4 days	1 2 3	
J08	Is there any health education about iron/folate supplement during collecting your supplement?	Yes No	1 2	
J09	If yes ,what was the issue	Purpose of supplement…….. Duration of the supply Side effect … Follow up visit…..	1 2 3	

Part II. Maternal and Newborn anthropometric measurement

I01	Maternal MUAC in cm	In cm----------	
I02	Maternal Height in meter	In meter---------	
I03	Maternal Hgb before delivery(during labor)	In mg/dl---------	
104	Weight of the New born	In k.g----------	

Thank you!

Annex2: Amharic Version Questionnaire

የአማርኛ ቋንቋ መጠይቅጤና ይስጥልኝ ። ስሜ..... ሲሆን ዛሬ እዚህ የተገኘሁት የጅማ ዩኒቨርሲቲ ኢንስቲቱት አፍሄሌዝ ዱፓርትመንት አፍ ሁዩማን ኑትሪሽን ተማሪ የሆነውን ሻፊ ሰይድ አምዳን በመወከል ሲሆን ጥናቱም የማስተርስ ደግሪውን ለማግኘት የሚጠመው ሆኖ ከትክክለኛዉ (2.5 ኪ.ግ) መጠን በታች ሆነዉ የሚወለደ ህጻናትን የሚያጋልጡ ነገሮች ምን እነደሆኑ ስልጤ ዞን ውስጥ በሚገኙ የመንግስት የጤና ተቋማት በሚል ርእስ የሚሰራ ነው ። የዚህ ጥናት ውጤቶች ለተለያዩ ባለድርሻ አካላት መፍትሄ የሚያስፈልጋቸውን ነጥቦች ከትክክለኛዉ (2.5 ኪ.ግ) መጠን በታች ሆነዉ የሚወለዱ ህጻናትና የሚያጋልጡ ነገሮች ምን እነደሆኑ ለመለየት ያግዛለ።የሚሰበሰበውን መረጃ ምስጢራዊነቱን ለመጠበቅ መጠይቁን ሲሞሉ ስምዎ በየትኛዉም ቦታ ላይ አይፃፍም። ጥናቱ በእናትየዋ ላይም ሆነ በልጁ ላይ ምንም አይነት ጉዲት አያስከትልም።መጠየቅ የሚፈልጉት ማንኛውም አይነት ግሌጽ ያልሆነ ጥያቄ መጠየቅ የሚቻል ሲሆን ለመመለስ ፍቃደኛ ያልሆኑባቸውን ያለመመለስ ወይንም ደግሞ የማቆም መብትዎ የተጠበቀ ነው።

በዚህ ጥናት ለመሳተፍ ፍቃደኛ ነዎት 1.አዎ (ቃለመጠይቁን እንቀጥላለን)---------- 2.አይደለሁም (አመሰግናለው) --

የጤና ተቋሙ ስም፡----------

የጠያቂው ስም_____ ፉርማ._____

የሱፐርቫይዘር ስም_____

ፉርማ._____

የተጠየቀበት ቀን (በኢትዮጵያ አቆጣጠር)------/-----/

ክፍል 1. ይህ መጠይቅ የእናቶቸን ማህበራዊ ና ኢኮኖሚያዊ ሁኔታዎች የሚገልጽ ነዉ

ተ.ቁ	ጥያቄዎች	ለምርጫ የቀረቡ ምላሾች	እለፍ
A01	መጠይቅ የጤና ተቀሙ ስም ና የልጁ መለያ ቁጥር (ከቃለ መጠይቁ በፊት ቁጥር መሰጠት አለበት)	የሆስፒታ/ጤና ጣቢያዉ ስም: _____ የእናት ሙለ ስም_____ የልጁ መለያ ቁጥር _____ ቀበሌ_____ ዞን_____ ጎጥ_____	
A02	የተጠየቀበት ቀን	[_____|_____| _____| ቀን |ወር |ዓ.ም	
A03	እዴሜሽ ስንት ነዉ?	እዴሜ በአመት_____	
A04	ሃይማኖትሽ ምንድን ነዉ?	1. ሙስሊም 2. ኦርቶዶክስ 3. ፕሮቴስታንት 4. ሌላ ካለ ጥቀስ	
A05	ብሄርሽ ምንድን ነዉ?	1. ስልጤ 2. አማራ 3. ኦሮሞ 4. ጉራጌ 5. ሌላ ከሆነ ይጠቀስ----	
A06	የትምህርት ደረጃ	1. ማንበብ እና መጻፍ የማልችል 2. ማንበብ እና መጻፍ የምችል 3. የመጀመሪያ ደረጃ 4. ሁለተኛ ደረጃ 5. ኮሌጅና ከዚያ በሊይ	
A07	የባለበቤትሽ የትምርት ደረጃ	1. ማንበብ እና መጻፍ የማይችል 2. ማንበብ እና መጻፍ የሚችል 3. የመጀመሪያ ደረጃ 4. ሁለተኛ ደረጃ 5. ኮሊጅና ከዚያ በሊይ	
A08	መኖሪያሽ የት ነዉ?	1. ገጠር 2. ከተማ	
A09	በአሁኑ ወቅት የትዳር ሁኔታዎ ምንደ ነው?	1. ያገባው 2. ግላዊ/ብቸኛ 3. የተፈታች 4. ባለቤቷ ህይወቱ ያለፈ	

A10	የስራ መስክዎ ምንድን ነው?	1. ተማሪ 2. የመንግስት ተቀጣሪ 3. የግሌ ዴርጅት ተቀጣሪ 4. ንግድ 5. የቤትእመቤት 6. የቀን ሰራተኛ 7. ገበሬ 8. ሌላ (ይገለፅ).....	
A11	የባለቤትሽ የስራ መስክ ምንድን ነው?	1. ተማሪ 2. የመንግስት ተቀጣሪ 3. የግል ድርጅት ተቀጣሪ 4. ንግድ 5. ገበሬ 6. የቀን ሰራተኛ 7. ሌላ (ይገለፅ).....	
A12	የቤተሰባችሁ አባሊት ብዛት ስንት ነው?	1. ከ5 በታች 2. ከ5 በላይ	
A13	የቤተሰብ ሀላፉ	1. ሚስት 2. ባል	
A14	የባሇበቤትሽ የጋብቻ ሁኔታ	1. አንድ ሚስት ብቻ 2. ከአንድ በሊይ ሚስት	

ክፍል 2: የቤተሰብ የገቢ ሁኔታ

ተ.ቁ	ጥያቄዎች	አዎ	የለም
	ቤተሰቡ ወይንም ከቤተሰቡ መካከል አንድ አባልከታች የተዘረዘሩት ንብረቶች ባለቤት ከሆነ1 ይፃፈ ከሌለ ደግሞ 0 ይፃፈ። (ማክበብ)		
B01	የኤላትሪክ አገሌግልት በቤት ውስጥ ይገኛል?	1	0
B02	ቴሊቪዥን	1	0
B03	ሰኣት (የግድግዲ ወይም የእጅ)	1	0
B04	ማቀዝቀዣ	1	0
B05	ሬዴዮ	1	0
B06	ተንቀሳቃሽ ስልክ	1	0
B07	መደበኛ ስልክ	1	0
B08	ጠረጴዛ	1	0
B09	ወንበር	1	0

B10	አልጋ ሞዝቮሌድ የጥጥ/የስፖንጅ/የስፕሪንግ ፍራሽ	1	0

B11	የኤላክትሪክ ምጣዴ	1	0
B12	በጋዝ የሚሰራ አምፖሌ(ኩራዝ)	1	0
B13	ብስክላት	1	0
B14	ሞተር ሳይክሌ / ባጃጅ	1	0
B15	መኪና	1	0
B16	በእንስሳት የሚጎተት ጋሪ	1	0
B17	መኪና/የጭነት መኪና	1	0
B18	የጭነት ጋሪ	1	0
B19	የዉሀ ፓንፕ	1	0
B20	የባንባ ዉሀ	1	0
B21	የባንባ ዉሀ መኖሪያ ቤት ዉስጥ	1	0
B22	የባንባ ዉሀ አጥር ግቢ ዉስጥ	1	0
B23	የህዝብ የባንባ ዉሀ	1	0
B24	የጉዴገዴ ዉሀ	1	0
B25	የምንጭ ዉሀ	1	0
B26	የዝናብ ዉሀ	1	0
B27	የመሬት ዉሀ	1	0
B28	ወንዝ/ሀይክ/ኩሬ /ግዴብ	1	0
B29	የታሸገ ዉሀ	1	0
B30	መጸዲጃ ቤት	1	0
B31	የጋራ መጸዲጃ ቤት	1	0
B32	የሚታረስ መሬት	1	0
B33	የባንክ ወይም የቁጠባ ዯብተር	1	0

	ቤተሰቡ ወይንም ከቤተሰቡ መካከል አንድ አባል ከታች የተዘረዘሩት እንስሳት አሉት (ማክበብ)	ኣዎ	የለም	ብዛት
B34	በሬ		1	0
B35	ላም		1	0
B36	ፈረስ/በቅልሎ		1	0
B37	ፍየል/በግ		1	0
B38	ዶሮ		1	0
B39	ኣህያ		1	0

ክፍል 3: የህጻኑ ሁኔታዎች

ተ.ቁ	ጥያቄዎች	ለምርጫ የቀረቡ ምላሾች
C01	የልጁ ፆታ	ወንድ _____ 1 ሴት _____2
C02	የልጁ ክብደት	ክብደት በግራም: ክ1____ክ2.____ ክ3___
C03	የልጁ ቁመት	ቁመት በሴ.ሜ:ቁ1____ቁ2.____ቁ3_____
C04	ስንተኛ ልጅ ነዉ?	በቁጥር

ክፍል 4: የእናተየዋን የጤና እና የማህፀን ሁኔታ

ተ.ቁ.	ጥያቄዎች	ለምርጫ የቀረቡ ምላሾች	እለፍ
D01	ምን ያህል ግዜ እርግዝና ነበርዎት?	እርግዝና: _____	
D02	ስንተኛ ጊዜ ነው አሁነ ስትወልጂ? እርግዝናዉ ከ28 ሳምንት በሊይ የሆነ .	የተወለዱ ልጆች ብዛት:	እርግዝናዉ-I ከሆነ ወደ ጥ.ቁ. D03 ይሆፈ
D03	ከአሁን በፊት የተቋረጠ ፅንስ ነበር?	1. አዎ 2. አላውቅም 3. አላስታውስም	መልሱ አያውቅም ከሆነ ወደ ጥ.ቁ. D05 እለፍ
D04	የተቋረጠ ፅንስ ምን ያህል ነበር?	……	
D05	ከጊዜው ቀድሞ የተወለደ ፅንስ ነበር? (≤37ሳምንት)?	1. አዎ 2. አላውቅም 3. አላስታውስም	
D06	ለመጨረሻ ጊዜ የወር አበባሽ መፍሰስ የጀመረው መቼ ነው? (የእርግዝና ቆይታ)	የእርግዝና ቆይታ ስትወልድ በሳምንት : _____	
D07	በአሁኑ እና ከዚህ በፉት በወለድሽዉ ልጅ መሀከሌያለዉ የጊዜ ሌዩነት ምን ያህል ነዉ? (ከዚህ በፉት የተወለደ ልጅ ካለ)	----------	
D08	እርግዝናው እንዴት አይነት ነበር?	1. የታቀደና የተፈለገ 2. ያልታቀደ ግን የተፈለገ 3. ያልታቀደና ያልተፈለገ	

D09	በእርግዝናሽ ወቅት የጽንስ ክትትል ነበረሽ?	1. አለኝ 2. የለኝም 3. አላስታውስም	መልሱ የለኝም ወይም አላስታውስም ከሆነ ወደ ጥ.ቁ D12 ይለፈ
D10	የቅድመ ወሊድ ክትትል እርግዝናው ምን ያህል ጊዜ ሲሆነው ጀመርሽ?	በ _____ ወር	
D11	በአጠቃሊይ ስንት ክትትል ነበረሽ?	በ ቁጥር----------	
D12	በዚህ እርግዝና ወቅት የተሰጠሽ ወይንም ገዝተሽ የወሰድሽው የመልቲ ቫይታሚን ኪኒን ወይም ሽሮፕ አለ? (ኪኒኑን ወይም ሽሮፑን አሳይ).	1. አዎ 2. አልወሰድኩም	
D13	በዚህ እርግዝና ወቅት ወይንም ከዚህ እርግዝና በፉት በማንኛውም ጊዜ የቲታነስ ክትባት ወስደሻል?	1. አዎ 2. አልወሰድኩም 3. አላስታውስም	
D14	በዚህ እርግዝና ወቅት የትላትል መድሃኒት ወስደሻል?(ኪኒኑን አሳይ)	1. አዎ 2. አልወሰድኩም 3. አላስታውስም	
D15	የታወቀ ህመም አለብሽ?	1. አዎ 2. የለም 3. አላውቅም	
D16	የትኛዉ አይነት በሽታ	1. ከዚህ በፉት የነበረ ግፉት ህመም 2. የስኪር ህመም 3. በእርግዝና ወቅት የተከሰተ ግፉትህመም 4. ሌላ(ይገሇፅ).....	
D17	በእርግዝናዎ ወቅት የደም ግፉት ህመም እንዳለብዎት ተነግሮዎት ያውቃሉ?	1. አዎ 2. የለም 3. አላስታውስም	

ክፍል 5: የእናት አመጋገብ ሁኔታ

ከዚህ በመቀጠል ደግሞ ባለፈት 24 ሰአት ዉስጥ ማለትም ትላንት ፀሀይ ከወጣችበት ጀምሮ እስከ ዛሬ ፀሀይ እስከወጣችበትጊዜ ድረስ ስለተመገቡት የምግብ አይነት ይሆናል::

	ዝርዝሩን አንብብ ማክበብ“1” ለተገለፀዉ እና “0” ላልተገለፀዉየምግብ አ	መለያ	
E01	ማንነኛዉም ከእህል የተሰሩ ምግቦች (ማሽላ፣ በቆሎ፣ ስንዴ፣ ጤፍ,)…….	1	0
E02	ማንነኛዉም ከስራስር የተሰሩ ምግቦች (ድንች፣ ስኩዋር ድንች፣ ቀይ ስር፣ ወይም ሌላ በአካባቢዉያለ ከስራስር የተሰሩ ምግቦች)……..……	1	0
E03	ማንነኛዉም ከጥራጥሬ የተሰሩ ምግቦች (ምሳሌ. ምስር፣ ባቄላ፣ አኩሪአተር፣ ወይም አተር)……	1	0
E04	ማንነኛዉም ከለዉዝ የተሰሩ ምግቦች (ምሳሌ የለዉዝ ቅቤ፣ ለዉዝ)….....	1	0
E05	ማንነኛዉም በዘይት ፣ በስብ ወይም በቅቤ የተሰሩ ምግቦች …….	1	0
E06	ማንነኛዉም የወተት ውጤቶች (ምሳሌ ወተት፣ አይብ ወይም እርጎ)	1	0
E07	ስጋ (ምሳላ. የበግ፣ የበሬ፣ የጥጃ፣ የፍየሌ፣ ጉበት፣ አንጎሌ፣ ሌሎች እንደ ጨጉዋራ፣ የከብት አንጀቶችያለ ምግቦች)…….…….	1	0
E08	የሚበለ የወፍ ዘሮች (ምሳላ. ድሮ፣ የአሜሪካ ድሮ፣ ዲክዬ)…….….	1	0
E09	አሳ ……..……..	1	0
E10	እንቁላል…….….....	1	0
E11	አረንጉዋዴ ቅጠላማ አትክልቶች (ቆስጣ፣ ሰላጣ፣ ጎመን)…….….....	1	0
E11	ማንነኛዉም ከዱባ፣ ካሮት፣ ጥቅል ጎመን፣ ቀይ ስኩዋር ድንች፣ ማንጎ፣ ፓፓያ፣ ……..	1	0
E12	ሌሎች ፍራፍሬዎች? (ምሳሌ ሙዝ፣ አፕሌ፣ አቮካዶ፣ የሾላ ፍሬ፣ ወይን፣ ብርትኳን፣ሎሚ	1	0
E13	ሌሎች አትክልቶች ? (ምሳሌ ሽንኩርት፣ ቲማቲም፣ ነጭ ሽንኩርት) …….….....	1	0

ክፍል 6: የእናት የአመጋገብ ዘይቤ ጥያቄዎች

ከዚህ በመቀጠል ደግሞ በዚህ እርግዝና ወቅት ስለሚከተለት የምግብ አወሳሰድ ልምድ የተመለከተ ጥያቄዎችን እጠይቆታለሁ::

ተ.ቁ	ጥያቄዎች	ለምርጫ የቀረቡ ምላሾች	እለፍ

F01	አብዛኛውን ጊዜ በቀን ውስጥ ስንት ጊዜ ምግብ ይመገባሉ?	1. አንዴ ጊዜ 2. ሁሇት ጊዜ 3. ሶስት ጊዜ 4. አራት ጊዜ 5. አምስት ጊዜ እና ከዚያበሊይ	
F02	በዚህ እርግዝና ወቅት ከወትሮ የተለየ ተጨማሪ ምግብ ትወስጂ ነበር?	1. አዎ 2. አልወሰድኩም 3. አላስታውስም	
F03	በቀን ውስጥ የሚከተለት መደበኛ የአመጋገብ ስርአት ምን ይመስላል?	1. ቁርስ ፣ምሳ ፣እራት 2. ቁርስ ፣መክሰስ ፣ምሳ ፣እራት 3. ቁርስ ፣ምሳ ፣መክሰስ ፣እራት 4. ቁርስ ፣መክሰስ ፣ምሳ ፣መክሰስ ፣እራት 5. ቁርስ ፣መክሰስ ፣ምሳ ፣መክሰስ፣እራት፣ለሊት መክሰስ	
F04	ከማርገዝዎ በፉት በቀን ውስጥ ስንት ጊዜ ምግብይመገቡ ነበር?	_____ ጊዜ	
F05	መደበኛ የምግብ ጊዜዎን የመዝለል ልምድ አሎት?	1. አለኝ 2. የለኝም 3. አላስታውስም	የለኝምከሆነ ወደF07እለፍ
F06	የጥ.ቁ F05 መልስዎ አለኝ ከሆነ, የምግብ ጊዜዎን የሚዘለበት ምክንያት ምንድነው?	1. ስለሚደክመኝ 2. ስራ ስለሚበዛብኝ እረሳዋለው 3. ክብደቴ እንዲይጨምር(እንዳልወፍር) 4. ሌላ ከሆነ ይጥቀሱ	
F07	በዚህ እርግዝና ወቅት ፅም ይፆማሉ?	1. እፆማለሁ 2. አልፆምም 3. አላስታውስም	
F08	ነፍሰጡር ከሆኑ በኋላ መብላት የማይፈሌጉትወይም መመገብ ያቆሙት የምግብ አይነት ይኖራል?	1. አለ 2. የለም 3. አላስታውስም	የለም ከሆነ ወደ ክፍሌ G
F09	የጥ.ቁ F08 መልስዎ አለ ከሆነ, የትኛውን የምግብ አይነት አብዝተው ይጠላሉ?	1. ቡና 2. ገንፎ፣ አጥሚት፣ ዳቦ፣ተልባ 3. ሽሮ ወጥ(ሌላ ጥራጥሬ) 4. ቀይስር፣ ቲማቲም፣ ቃሪያ (ሌሎች አትክልቶች) 5. እንቁላል ፣ወተት እና የወተት ውጤቶች 6. ሙዝና ሌሎች ፍራፍሬዎች 7. ስጋ 8. ሌላ ከሆነ ይጥቀሱ	

F10	ይህንን ምግብ ላለመመገብዎ ምክንያት ምንድነው?	1. ስለሚያስጠላኝ 2. ነፍሰጡር እናት ልትመገበው የተፈቀደ ስላልሆነ(ባህላዊ) 3. ሀይማኖቴ ስለማይፈቅድ 4. ሌላ ከሆነ ይጥቀሱ	2 ከሆነ ወደ F12 3/4 ከሆነ ወደ F13
F11	ምግቡ ስለሚያስጠላኝ ከሆነ በምን ምክንያትነው የሚያስጠላዎት?	1. የምግቡ ሽታ(ጣዕም) 2. ደረቴን ስለሚያቃጥለኝ/ምቾት ስለ ማይሰጠኝ/ 3. ስለሚያቅለሸልሸኝ/ስለሚያስመልሰኝ/ 4. ምክንያቱን አላውቀውም	
F12	የላይኞቹ ምግቦች በነፍሰጡር እናቶች እንዲይበሉ የሚከለከልበት ባህላዊ ምክንያት ምንድነው?	1. ሌጁን ትልቅ በማድረግ ምጥ አስቸጋሪ እንዲሆን ያደርጋል 2. የፅንሱ ጭንቅላትና ሰውነት ስለሚለጠፍ 3. ውርጃ ስለሚያመጣ 4. የቡዲ አይን እንዲይበሊ 5. ፅንሱ ሊይ ችግር ስለሚያመጣ 6. የሕፃኑን ፀጉር ይመልጣል 7. ሌላ ከሆነ ይጥቀሱ	
F13	ባለፉት ዘጠኝ ወራት ዉስጥ ከቤት ዉጭ ስንት ጊዜ ምግብ ተመግበዋል?	1. በየቀኑ 2. በሳምንት 3. በወር 4. በፍፁም	

ክፍል 7. የእናትየዋ የልምድ (አድራጎት) ሁኔታ

ተ.ቁ	ጥያቄዎች	ለምርጫ የቀረቡ ምላሾች	እለፍ
G01	በእርግዝናሽ ወቅት ጫት ትቅሚ ነበር?	1. አዎ 2. አይደለም	

G02	አዎ ካልሽ, የአቃቃም ሁኔታሽ እንዴት ነበር?	1. በየእለቱ/ያለማቆራረጥ 2. አንዳንድ ጊዜ/በተቆራረጠ መልኩ 3. አልፎ አልፎ	
G03	በእርግዝናሽ ወቅት ሲጋራ ታጨሽ ነበር?	1. አዎ 2. አይደለም	
G04	አዎ ካልሽ, የአጫጫስ ሁኔታሽ እንዴት ነበር?	1. በየእለቱ/ያለማቆራረጥ 2. አንዳንድ ጊዜ/በተቆራረጠ መልኩ 3. አልፎ አልፎ	
G05	አልኮልነት ያለው መጠጥ ጠጥተሽ ታውቂያለሽ?	1. አዎ 2. አይደለም	
G06	አዎ ካልሽ, የጠጣጥ ሁኔታሽ እንዴት ነበር?	1. በየእለቱ/ያለማቆራረጥ 2. አንዳንድ ጊዜ/በተቆራረጠ መልኩ 3. አልፎ አልፎ	

ክፍል 8. የ አካባቢያዊ ሁኔታዎች

ከዚህ በመቀጠል ስለመጠጥ ዉሃ ምንጭ እና መፀዳጃ ቤት ሁኔታዎች እጠይቅሻለሁ።

ተ.ቁ	ጥያቄዎች	ለምርጫ የቀረቡ ምላሾች	እለፍ
H01	የቤቱ የመጠጥ ዉሀ አይነት ምንድነዉ?	የባንባ ዉሀ መኖሪያ ቤት ዉስጥ……01 የህዝብ የባንባ ዉሀ……02 የጉድጉድ ዉሀ…….…….....03 የታንከር ዉሀ……04 የመሬት ዉስጥ ዉሀ (ዉሀ፣ ሀይቅ፣ ኩሬ……)05 ሌላ ከሆነ ይጥቀሱ _____ 77	
H02	ዉሀ ለመቅዳት ምን ያክል ጊዜ ይወስዳል? ማለትም ዉሀ ለመቅዲት እና ወደ ቤት ለመመለስ?	ከአንዴ ሰአት በታች…… ……..…01 አንዴ ሰአት እና ከዛ በታች …….02 ከህንፃ እስከ መሬቱ……...03	
H03	የዉሃ ማጣሪያ ትጠቀሚያለሽ?	አይ……...…...00 አዎ, ሁሌጊዜ…….....01 አዎ, አንዲንድ ጊዜ ……..…..…..02	
H04	ለማጣሪያነት የምትጠቀሙት ምንድን ነዉ?	አይ ……..……00 ማፍላት…….01 ማንጫ/ክልሪን/ዉሀ አጋር…….……02 በጨርቅ ማጣራት…….…….....03 ዉሀ ማጣሪያ በመጠቀም (አሸዋ፣ ወዘተ)……04 ወደታች እንዱዘቅጥ በማዴረግ…….....05 ዉሀ ማጣሪያ ዉጤቶች…….....06 ኤላ ከሆነ ይጥቀሱ ……...……..77	

H05	የምትጠቀሙት የመፀዳጃ ቤት አይነት	ቆሻሻ መተላለፉያ ያለዉ ዉሃ ማፍሰሻ ያለዉ……..01 ዉሃ ማፍሰሻዉ ወደ ታንኩ የሚገባ……....02 ዉሃ ማፍሰሻዉ ወደ ጉዴጉዋዴ የሚገባ……..03 ወሃ ሌላ ቦታ የሚፈስ……04 አየር ማስወጫ ያለዉ(VIP)… ……05 የጉድጉዋድ ክዳን ያለዉ…..……..……06 የጉዴጉዋዴ ክዲን የሌለዉ …….07 ቆሻሻ ያለዉ……...……08 መፀዳጃ ቤት የለም/ሜዳ ሊይ..……..…..09 ሌላ ከሆነ ይጥቀሱ …. ……..…..……77 አላስታዉስም ……..…….88	
H06	ቆሻሻን የምታስወግደበት መንገድ	በከተማ ማዘጋጃ ቤት ይሰበሰባል…….……...01 ይቀበራል……...……....02 በግል ማህበሮች ይሰበሰባሌ…….....03 መንገድ ላይ ይጣላል /ባድ ቦታ ላይ ……..…....04 በግቢ ዉስጥ…….....…..05 ወንዝ ዉስጥ …….....06 ይቃጠላል…….....07 ሌላ ከሆነ ይጥቀሱ …… …….……...77	
H07	ከመፀዳጃ ቤት መልስ እጅሽን የመታጠብ ልማድ አለሽ?	የለኝም ……01 አዎ, ብዙጊዜ……;.....02 አዎ, አልፎ አልፎ ……03	
H08	አዎ ካልሽ, እጅሽን ለመታጠብ የምትጠቀሚዉ ምንድን ነዉ (ከአንዴ በሊይ መልስ ይቻላል	በሳሙና……..……01 Ash……02 በቅጠሌ…….....……..…….03 በምንም…….……04 ሌላ ከሆነ ይጥቀሱ……...…….77	

የምግብዋስትና ሁኔታ በተመለከተ የሚጠየቁ ጥያቄዎች

ተ.ቁ	የምግብ ዋስትና ሁኔታ	ምርጫ	እለፍ

I01	ባለፉት አራት ሳምንታት ጊዜ ዉስጥ ቤተሰቡ በቂ ምግብ የለዉም የሚል ስጋት ገብቷችሁ ነበር? ቤተሰብ ማለት **ቢያንስ በሳምንት ለአራት ቀን ያህል በአንድ ጣሪያ ስር** አብራችሁ የምታድሩ ናየምትመገቡ **ለማለት ነዉ**።	1. ኣዎ 2. አይደለም	
I02	አዎ ከሆነ ለምን ያህል ጊዜ ትሰጉ ነበር?	1. በጣም አልፎ አልፎ(ባለፉት አራትሳምንታት አንዴ ወይም ሁለቴ) 2. አንድአንድ ጊዜ (ባለፉት አራት ሳ ምንታት ከ3 እስከ 10ጊዜ) 3. ብዙ ጊዜ (ባለፉት አራት ሳም ንታት ከ10ጊዜ በሊይነበር)	
I03	ባለፉት አራት ሳምንታት ጊዜ ዉስጥ አንተ/ቺ ወይም ሌላ የቤተሰቡ አባሌ የፈለገዉን ወይም የመረጠዉን የምግብ አይነት ለመብላት የአቅም ማነስ ችግር ገጥሟችሁነበር? የመረጠዉን የምግብ አይነት ማለት ማንኛዉም በምግብ እራሱን የቻለ ቤተሰብ የሚመገበዉ አይነት ማለትነዉ። ለምሳሌ እንቁሊሌ;ስጋ; አሣ; ዶሮወጥናየመሳሳለትማለትነዉ። የአቅም ማነስ ችግር ማለት ለመግዛት የሚሆንገ ንዘብ ማጣት ወይም ማምረት አለመቻል ማለትነዉ።	1. ኣዎ 2. አይደለም	

I04	አዎ ከሆነ ለምን ያህል ጊዜ ትሰጉ ነበር?	1. በጣም አልፎ አልፎ(ባለ**ፉት አራትሳ**ምንታት አንዴ ወይም ሁለቴ) 2. አንድአንድ ጊዜ (ባለ**ፉት አራት ሳ** ምንታት ከ3 እስከ 10ጊዜ) 3. ብዙ ጊዜ (ባለ**ፉት አራት ሳ**ም ንታት ከ10ጊዜ በሊይነበር)	
I05	ባለፉት አራት ሳምንታት ጊዜ ዉስጥ አንተ/ቺ ወይም ሌላ የቤተሰቡ አባል የሚያስፈልገዉን አቅም ከማጣት የተነሳ ዉስን የሆኑ የምግብ አ**ይነቶች**ን ለ***መመገብ ተገዳችሁ ነበር***?ዉስን የሆኑ ሲባል ተመጋቢዉ መመገብ የማይፈሌገዉ አንድ አ**ይነት ምግብ** ለ**ብዙ ጊዜያት** ለ***ማለትነዉ***።	1.አዎ 2.አይደለም	
I06	አዎ ከሆነ ለምን ያህል ጊዜ ነበር የተከሰተዉ?	1. በጣም አልፎ አልፎ(ባለ**ፉት አራትሳ**ምንታት አንዴ ወይም ሁለቴ) 2. አንድአንድ ጊዜ (ባለ**ፉት አራት ሳ** ምንታት ከ3 እስከ 10ጊዜ) 3. ብዙ ጊዜ (ባለ**ፉት አራት ሳ**ም ንታት ከ10ጊዜ በሊይነበር)	

I07	ባለፉት አራት ሳምንታት ጊዜ ዉስጥ አንተ/ቺ ወይም ሌላ የቤተሰቡ አባል አቅም ስለ**ማይፈቅድና**ሌላ ምግብ መመገብ ስላልቻለችሁ ፈጽሞ ልትመገቡ የማትፈልጉትን ምግብ ለ**መመገብ ተገዳችሁ ነበር**? ፈጽሞ ልትመገቡ የማትፈልጉት ምግብ ማለት **በህብረተሰቡ ዘንድ** ማይወደድና ተቀባይነት የሌላቸ**ዉ ለማለት ነዉ**::	1. አዎ 2. አይደለም	
I08	አዎ ከሆነ ለምንያህሌ ጊዜ ነበር የተገደዳችሁት	1. በጣም አልፎ አልፎ(ባለ**ፉት አራት**ሳምንታት አንዴ ወይም ሁለቴ) 2. አንድአንድ ጊዜ (ባለ**ፉት አራት ሳ** ምንታት ከ3 እስከ 10ጊዜ) 3. ብዙ ጊዜ (ባለ**ፉት አራት ሳ**ም ንታት ከ10ጊዜ በሊይነበር)	

የደም ማነስመ ድኃኒት አጠቃቀም በተመሆከተ ጥያቄዎች

601	በቅድመወሊድክትትሌወቅትየደምማነስመድኃኒትተሠጥ ቶዎትነበር?የመድኃኒቱንቀሆምበመናገር/መድኃኒቱንበ ማሳየትእንዲያስታዉሊያድርጉ	አዎ አሌተሠጠኝም	1 2
602	ሆመጀመሪያጊዜመድኃኒቱንየተጠቀሙትመቼነዉ?	ከ1-3ወርበሆእርግዝናዎቅትከ3-6ባሆእርግዝናዎቅት ከ6-9ባሆእርግዝናዎቅት	1 2 3
603	በቅድመወሊድክትትሌወቅትየደምማነስመድኃኒትሆስንት ወርወስደሻሌ?	ከ1ወርሆነሰጊዜ ሆ1 ወር ሆ2 ወራት ሆ3ወራት ከ3ወራትበሊይ	1 2 3 4 5
604	በምንአይነትሁኔታነወመድኃኒቱንየምትዎስጅዉ?	በየቀኑ በየሳምንቱ በሚያመኝግዜ	1 2 3
605	በአንድጊዜምንያህሌመድኃኒትነወየሚሰጥሽ?	30 ፍሬ 60ፍሬ 90ፍሬ ከ90ፍሬየሚበሌጥ	1 2 3 4
606	በሳምንትምንያህሌየደምማነስመድኃኒትነወየምትዎስጅዉ?	ሰባትቀናት ከ4-7 ቀናት ከ4 ሊነሱቀናት	1 2 3
607	ስሆደምማነስመድኃኒትየተሰጠሽትምህርትአሆ?	አዎ የሆም	1 2
608	አዎከሆነበምንሊይነወያሰተማሩሽ?	የመድኃኒቱጥቅም ሆምንያህሌግዜመዉሰ ድእንዳሆብሽ ስሆጉዳቱ ስሆክትትሌ	1 2 3 4

ክፍሌ **j.** የእናትየዋ ና የህጣኑ **anthropometric** ልኬት

J01	የእናትየዋ MUAC በ ሴ.ሜ	----------
JI02	የእናትየዋ ቁመት በሜትር	በሜትር ---------
J03	የእናትየዋ Hgb(የዯም መጠን ከመዉሇደዋ በፉት	በ mg/dl---------

ኣመሰግናለሁ

Annex 3: Siltigna version of Version Questionnaire(የስልጥኘ ሱልቸ)

ፊየ ሲነበቴን ።። ሱሜየ…….……..... ቲሆን አውጂ ቢቢታይ ኤት የትረከብኩይ በጅመ ዩኒቨርሲቲ ኢንስቲቱት አፍሄሌዝ ዱፓርትመንት አፍ ሁዩማን ኑትሪሽን ተማሪ የሆነይ ሻፊ ሰይድ አምዳን በወከሎት ቲሆን ጥናትሚ የማስተርስ ደግሪከ ለርከቦት ኢፊዩደያን ሆናኔ ተትክክለኛይ (2.5 ኪ..ግ) ቂጨ ኮሎ ሆኖኔ ኢትጩኖን ጨላልቸ ያትጋልጦን ግዘቸ ምን የሆነኮ ስልጤ ዞን ውስጥ ቢትረከቦን የመንግስት የፈይነት ተቋምቸ በቢላን ዱም ኢትረሻነን ።። ዩቲታሚ ጥናት ውጣትከ ለሉላሉሌ ባለድርሻ አካላትቸ መለ ያትኪሺማን ነጥብቸ ተሱተኛይ (2.5 ኪ..ግ) ቂጨ ኮሎ ሆኖኔ ኢትጩኖነይ ወልድቸ ያትጋልጠይማነይ ጊዘቸ ምን ዮሆኑኮ ለላሎት ያግዛን።። የፊፊሳይ ሚስጥረካይ ለቂሮት ሱልቻይ ቲሜሊ ሱማሙ በሃድም ኤት ኢለትከተብ።። ጥናትሚ ቢንደትምቴ ሆነ በጨሎሸ ደር ሀድም አይነት ጉዳት ኢላጀጅ=።። ተሳሎት ኢከሱያን ማነም ካሌ ሱለ ኩፍተ በሎነንኩም ተሳሎት ታቀትሎም ቲሆን ለክኒብሎት ፍቃደኘ ያልሆንኩብይሙ ሱር የልኪኒብሎት ሀነግን ደግሞ ያቃኖት አምራሙ የትቂረን።።

በኢታይ ጥናት ለትሳተፎት ፍቃደኛንኩም 1.አዎ (ሱለይ ኢቅጥልናን) ---------- 2.አሎንኩ (አህተ ቄውዳው)

የፈይነት ጋሪ ሱም፡----------

ኢትሳላነይ ሱም_____ መልከት._____

የሱፐርቫይዘር ሱም_____ መልከት._____

የትሳልቡይ አያም (በኢትዮጰ ኢልቅ) ------/-----/

ክፍል 1. ሂታይ ሱል የእንደትቻይ ማህበራዊ ዋ ኢኮኖሚያዊ ሁኔታ ኢትሳላነን

ወ.ኢ	ሱልቸ	ለምርጫ የቀረቡ ጀዋብች	ኢለፍ
	የትሳኣልቡይ አያም	[_____|_____| _____| አያም |ወሪ |አይዶ	
A01	የፈይነት ጋሪ ሱም ዋ የጩሎይ መለየ ኢልቅ(ተሱሊ ቀደ ኢልቅ ታቦት አለቢ)	ኡስቢታን/ጤና ጣቢያይ ሱም: _____ የእንደት ሙለ ሱም _____ የልጁ መለያ ቁጥር _____ ቀበሌ_____ ዞን_____ ጎጥ_____	
A02	ኡምራሽ ምስትን?	እዴሜ በአመት+++_____	
A03	ዲናሽ ምንግዝን?	5. ሙስሊም 6. ኦርቶዶክስ 7. ፕሮቴስታንት 8. ሌላ ካለ ጥቀስ	
A04	ብሄራሽ ምግዝን?	6. ስልጤ 7. ጉራጌ 8. አማራ 9. ኦሮሞ 10. ሌላ ከሆነ ይጠቀስ----	
A05	የአሸር ደረጀ	6. ኪተቦት ዋ አኒቦት ኢለውቺል 7. ኪተቦት ዋ አኒቦት ኢሽላው 8. ያፍቴ መቃም 9. ሆሽትለኜ መቃም 10. ኮሌጅ ዋ ሀቲ ደር	
A06	የባለበቤትሽ የትምርት ደረጃ	6. ኪተቦት ዋ አኒቦት ኢለሽላን 7. ኪተቦት ዋ አኒቦት ኢሽላን 8. ያፍቴ መቃም 9. ሆሽትልኔ መቃም 10. ኮሌጅ ዋ ሀቲ ደር	
A07	ኒባረታሽ አይኔን	3. ገጠር 4. ከተመ	
A08	ባኩ ወክት የዘውጅ ሁኔተ አይነኮን?	5. አገባሆ 6. ቢቾንኩ 7. ተፋታሆ 8. የጋር አቦቴ የሞተ	

A09	ብላሽ ምንግዝን	9. ደረሰ 10. የመንግስት ብለትኝ 11. የግሌ ድርጀት አለኝ 12. ዝልዛሎ 13. የጋር እንደት 14. የያም ብለትኝ 15. አራሽ 16. ገነ ባለ (ኢወጂ).....	

A10	የጋር አባትሽ ብል ምንግዝን?	8. ደረሰ 9. የመንግስት ብለትኝ 10. የግሌ ድርጀት አለኝ 11. ዝልዛሎ 12. የያም ብለትኝ 13. አራሽ 14. ገነ ባለ (ኢወጂ).....	
A11	ያበሮስሙ ብዥት ምስትን?	3. ከ5 ኮሎ 4. ከ5 ደር	
A12	ያበሮሲ አሚር ማኒ	3. ሚሽት 4. ሚሽ	
A13	የጋር አቦታሽ የዘውጅ ሃለት አይነኮን?	3. አንድ ሚሽት ብቻ 4. ተሃድ ሚሽት ደር	

ጎልጌ2: የቤተሰቢ የገቢ ሁኔተ

ወ.ኢ	ሱልቸ	አዎ	ኤለ
	የጋሪ ሰብ ሀነግን ተጋሪሰብ ሀድ ለኮሎ የትከተቡይ ንብረትች አቦት በሆነ1 የክተብ ቤለ 0 የክተብ። (ኪቦት)		
B01	የኤላትሪክ ጊልጋሎ በጋር ዉስጥ ኢትረከባን?	1	0
B02	ቴሊቪዥን	1	0
B03	ሰኣት (የግርግደ ሀነግን ዪእጅ)	1	0
B04	ማቀዝቀዣ	1	0
B05	ሬዴዮ	1	0
B06	ተቅላቃይ ስልክ	1	0
B07	መደበኝ ስልክ	1	0
B08	ጡረዴዛ	1	0
B09	ወንበር	1	0
B10	አልጋ ሞዝቮሌድ የጥጥ/የስፖንጅ/የስፕሪንግ ፍራሽ	1	0

B11	የኤላክትሪክ ምጣድ	1	0
B12	በጋዝ ያሻን አምቦል(ኩራዝ)	1	0
B13	ብስክሌት	1	0
B14	ሞተር ሳይክሌ / ባጃጅ	1	0
B15	መኪነ	1	0
B16	በብሳወ ኢትጎተታን ጋሪ	1	0
B17	መኪና/የጭነት መኪና	1	0
B18	የጭነት ጋሪ	1	0
B19	የመይ ፓንፕ	1	0
B20	የባንባ መይ	1	0
B21	የባንባ መይ በጋር ዉስጥ	1	0
B22	የባንባ ብገቤይ ዉስጥ	1	0
B23	የአማይ የባንባ መይ	1	0
B24	የለገዶ መይ	1	0
B25	የምንጭ መይ	1	0
B26	የዝላም መይ	1	0
B27	የደች መይ	1	0

B28	የሚዴ/የሃይቅ/የኩሬ /በትገደበ	1	0	
B29	የታሸገ መይ	1	0	
B30	ኹማት ጋር	1	0	
B31	የቂጦ ኹማት ጋር	1	0	
B32	ያርሱያን ደች	1	0	
B33	የባንክ ሀነግን የቁጠበ ደብተር	1	0	
	ተጋሪ አበርሶ ሀድ ሰብ ለኮሎ የተዘረዘሩት እንስሳት አሉይ? (ባኪቦት)	ኣዎ	ኤ ለ	ቢልቅ
B34	ከራብ		1	0
B35	ላም		1	0
B36	ፈረዝ/ቦቅሎ		1	0
B37	ፌቅ/ጣይ		1	0
B38	ሂንጫቆ		1	0
B39	ኡማር		1	0

ጎልጌ 3: የጩሎይ ሃለት

ወ.ኢ	ሱልቸ	ለምርጫ የቀረቡ ጀዋብቸ
C01	የጩሎይ ልገ	ለጅ _____ 1 ገረድ _____2
C02	የጩሎይ ሂባጀ	ሂባጀ በግራም: ክ1____ክ2.____ ክ3___
C03	የጩሎይ ጉበ	ጉበ በሴ.ሜ:ቁ1____ቁ2.____ቁ3_____
C04	ምስትኛን ጩሎ?	በኢልቅ_____

ጎልጌ 4: የእንደተቴ የፈይነት ዋ የማሀፀን ሁኔታ

ወ.ኢ	ሱልቸ	ለምርጫ የቀረቡ ጀዋብቸ	ኢለፍ
D01	ምስት ግን ሃሚል ሆንሼሽ?	እርግዝና: _____	
D02	አኩ ምስትኛኒ ትጩኜሽ? ሃሚልነቲ ተ28 ሳምንት ደር የሆነ .	የትጩኑ ወልድቸ ቂጨ	ሃሚልነቲ-I በሆነ ወዶ ኢልቅ D03 እለፍ።
D03	ታኩ ቀደ የትቋረጠ ፅንስ ናረ?	4. አው 5. እለውችል 6. እለዌክስ	ጀዋብከ እለውችል በሆነ ወዶ ኢልቅ D05 እለፍ
D04	የትቋረጠይ ፅንስ ምስትን ናር?	……	
D05	ተውክተከ ቀደማኔ የትጩኜ ፅንስ ናረ? (≤37ሳምት)?	4. አው 5. እለውችል 6. እለዌክስ	
D06	ሀይድ ለመትፈጀ ወክት ፍሰሶት የጀመረይ መቼን? (የሀሚልነት ወክት)	በሳምት : _____	
D07	ባኩ ወክት ዋ ታኩ ቀደ ብጩኜሺ ወልድ ያለይ ሉሌነት ምስትን? (ታኩ ወደ የትጩኜ ወልድ ባለ)	----------	
D08	ሃሚልነቲ አይነኮን ናር?	4. የትዌጠነ ዋ የትከሼ 5. የልትዌጠነ ግን የትከሼ 6. የልትዌጠነ ዋ የልትከሼ	

D09	በሃሚልነታሽ ወክት ክትትል ናረሽ?	4. አለኝ 5. ኤለኝ 6. አላስታውስም	ጀዋብከ ኤለኝ በሆነ ወደ ወኢ D12 ኢለፈ
D10	የቅድመ ወሊድ ክትትል ሃሚልነቲ ምን ያህል ወክት ቲሆን ጀመርሽ?	በ _____ ወሪ	
D11	በአጠቃሊይ ስንት ክትትል ነበረሽ?	በ ኢልቅ----------	
D12	በቢ ሃሚልነት ወቅት ያቡሽ ወይንም ወከብሼ የወሰድሽው የመልቲ ቫይታሚን ኪኒን ወይም ሽሮፕ አለ?	3. አው 4. አሎሰድኮ	
D13	በቢታይ ሃሚልነት ወክት ወይንም ቲቲ ሃሚልነት በማንኛውም ጊዜ የቲታነስ ክትባት ወስደሻል?	1. አዎ 2. አሎሰድኮ 3. ኢለዋስታውስ	
D14	ቢቢ ሃሚልነት ወቅት የትላትል መድሃኒት ወስደሻል?(ኪኒኑን አቲር)	4. አወ 5. አሎሰድኮ 6. ኢለዋስታውስ	
D15	የትቻለ ሂንጪነ አለብሽ?	4. አው 5. ኤለ 6. አለውችል	
D16	አይነካሌ ሂንጪነ	5. ታኩ ቀደ የነበረ ግፉት ሀንጪነ 6. የስኪር ሂንጪነ 7. በሃሚልነት ወቅት የተከሰተ ግፉት ሂንጪነ 8. ገነ(የትገለፅ).....	
D17	በሃሚልነት ወቅት የደም ግፉት ሀመም እንዳለብዎት ተነግሮዎት ያውቃሉ?	4. አው 5. ኤለ 6. አለዋስታውስ	

ጎልጌ 5: ዪንደቴ ያአመጋግበ ሃለትሽ

ቲቲ ቀጠላኔ ደግሞ ባለፈይ 24 ሰአት ዉስጥ ባይትም ታቼነ አይር ቶጣትቢ ጀመራኔ እስከ አውጄ አይር ዮጣትቢ ጃንጎ የበላሺ ስንቀ አይነት ዮናን::

	የትጩቀሙ ሱር ባሉ አኪቦት“1” ለትጩቀመይ እና “0” ላልትጩቀመይ የስንቅ ኢይነት	መ ለያ	
E01	ማነኛምከ ከእሀል የትረሱ ስንቅች (ማሽላ፣ በቆሎ፣ ስረይ፣ ጣፍ,)…….	1	0
E02	ማንነኛዉምከ ተስራስር የትረሱ ስንቅች (ድንች፣ ስኩዋር ድንች፣ ቡሽ ስር፣ ሀነግነ ገነ በአካባቢ ያሉ ተስራስር የትረሱ ስንቅች)……..……	1	0
E03	ማንነኛዉምከ ተጥራጥሬ የትረሱ ምግቦች (ለባይትከ. ምስር፣ ባቄላ፣ አኩሪአተር፣ ወይም አተር)……	1	0
E04	ማንነኛዉምከ ተለዉዝ የተሰሩ ስንቅች (ለባይትከ የለዉዝ ኢሴቼ፣ ለዉዝ)….....	1	0
E05	ማንነኛዉምከ በዘይት ፣ በስብ ወይም ቢኤቼ የትረሱ ስንቅች …….	1	0
E06	ማንነኛዉምከ የወተት ውጤቶች (ለባይትከ ወተት፣ አይብ ወይም እርጎ)	1	0
E07	በሰር (ምሳላ. የጣይ፣ የበሬ፣ የጥጃ፣ የፌቅ፣ ጉበት፣ አንጎሌ፣ ገነገናም እንደ ጨጉዋራ፣ የዲነት አንጀቶችያለ ስንቅች)…….……	1	0

E08	ኢትበላን ዩንፍ ዘርች (ለበይተከ. ድሮ፣ የአሜሪካ ድሮ፣ ዲክዬ)…+…….….	1	0
E09	ቁርጩሜ ……..……..	1	0
E10	ቡጾ…….….....	1	0
E11	አረንጉዋዴ ቅጠላማ አትክልትች (ቆስጣ፣ ሰላጣ፣ ሀምል)…….….....	1	0
E11	ማንነኛምከ ተዱባ፣ ካሮት፣ ጥቅል ጎመን፣ ቀይ ስኩዋር ድንች፣ ማንጎ፣ ፓፓያ፣ ……..	1	0
E12	ገነገናም ፍራፍሬዎች? (ባይት ሙዝ፣ አፕሌ፣ አቮካዶ፣ የሾላ ፍሬ፣ ወይን፣ ብርትኳን፣ሎሚ	1	0
E13	ገነገናም አትክልቶች ? (ባይት ሽንኩርት፣ ቲማቲም፣ ነጭ ሽንኩርት) …….....	1	0

ጎልጌ 6: የእንደት የትረዘቆት ሃለት ሱልቸ

ከዚህ በመቀጠል ደግሞ በዚህ እርግዝና ወቅት ስለሚከተለት የምግብ አወሳሰድ ልምድ የተመለከተ ጥያቄዎችን እጠይቆታለሁ::

ወ.ኢ	ሱልቸች	ለጀዋብ የቀረቡ መልስች	ኢለፍ
F01	አብዛኛይ ወክት ባያም ውስጥ ምስት ግን ስንቅ ትብዬሽ?	6. ሀድ ግን 7. ሆሽት ግን 8. ሼሽት ግን 9. አራት ግን 10. አምስት ግን ዋ ታቲ የበዘ	
F02	በቢታይ እርግዝና ወቅት ተወትሮ የርላዬ ተጨማሪ ስንቀ ትወጂ ናረ?	4. አው 5. አሎሰድከ 6. አለዋስታውስ	
F03	በያም ውስጥ ኢትኬተሎነይ መደበኛ የአመጋገብ ስርአት ምን ይመስላን?	6. ግንዝር ፣ባሬ ፣ኡርባት 7. ግንዝር ፣መክሰስ ፣ባሬ ፣ኡርባት 8. ግንዝር ፣ባሬ ፣መክሰስ ፣ኡርባት 9. ግንዝር ፣መክሰስ ፣ባሬ ፣መክሰስ ፣ኡርባት 10. ግንዝር፣መክሰስ፣ባሬ፣መክሰስ፣ኡርባት፣ለሊት መክሰስ	
F04	ሃሚል ተውኖት ቀደ ባያም ውስጥ ምስት ግን ስንቅ ትበይ ናር?	_____ ግን	
F05	መደበኛይ የስንቅ ወቅታናሙ የዝለሎት ልምድ አለሽ?	4. አለኝ 5. ኤለኝ 6. አለውስታውስ	ኤለኝ በሆነ ወደF07እለፍ
F06	የወ.ኢ F05 ጀዋብከ አለኝ በሆነ, የስንቅ ወክት ኢዘኡቡያን ምክንያት ምንግዝን?	5. ሊልጩጣኮ 6. ብል ሊበዝቢኛነከ ኢረሳያውው 7. ክብደቴ ለይደብልር(ለልወፍር) 8. ገነ ግዝ በሆነ (ኢውጂ)	
F07	በቢ ሃሚልነት ወክት ሶመንሼሽ ?	1. ኢሶሚናው 2. ኢለውሶሚን 3. ኢለውቺል	
F08	ሃሚል በሆንሽ ሬር ብሎት አትከሺያሽ ወይም ብሎት ያቃነንሺ የስንቅ አይነት አለ?	4. አለ 5. ኤለ 6. አለዋስታውስ	ኤለ በሆነ ወደ ክፍል G
F09	የወ.ኢ F08 ጀዋብ አለ በሆነ, አይነይ የስንቅ አይነት አበዛሽ ትጠዬሽ?	9. ቃወ 10. ሂንቃቼ፣ አጥሚት፣ ዳቦ፣ተልባ 11. ሽሮ ወጥ(ገነ ጥራጥሬ)	

		12. ቡሽ ስር፣ ቲማቲም፣ ቃሪያ (ገነገነአትክልትች) 13. እንቁላል ፣አይብ ዋ ያይብ ውጣትች 14. ሙዝ ዋ ገናም ፍራፍሬች 15. በሰር 16. ገነ በሆነ ጥቀሺ	
F10	ሂነይ ስንቅ ለልቢሎት ምክንያታሽምግዝን?	5. ሊጠግረኛነኮ 6. ሃሚል ኢንደት ሊትበልይ ለይቲፈቀዳነኮ(ባህላዊ) 7. ዲኔ ለይፈቀዳነኮ 8. ገነ በሆነ ጥቀሱ	2 ከሆነ ወደ F12 3/4 ከሆነ ወደ F13
F11	ሊጠግረኛነኮ በሆነ ምክንያትከ ምንግዝን?	5. የስንቂ ሽታ(ጣዕም) 6. ወዘኔ ሊማግደኛንኮ/ምቾት ስለ ማይሰጠኝ/ 7. ሊያቅለሽለሽእነኮ/ስለሚያስመልሰኝ/ 8. ምክንያተከ አለውቺል	
F12	የደርቻይ ስንቅቸ በሃሚል እንደትቸ አይቲበሎነኮ ኢታተርቢያነይ ባህላዊ ምክንያት ምንግዝን?	8. ጩሎይ የሮሬ ባሶት ምጥ አስቸጋሪ ዮናነኮ ያሻን 9. የፅንሲ ጭንቅላት ዋ ሰብነት ሊትለጠፋነኮ 10. ውርጃ ሊያመጨነኮ 11. የቡደ ኢን ላይበላይ 12. በፅንሲ ደር ችግር ሊያመጫነኮ 13. የጩሎይ ዱመክ መላጠ ያሻን 14. ገነ በሆነ የጥቀሱ	
F13	ባለፉይ ዚጠኜ ወራርቸ ተጋር አብሌ ስንቅ በላሼሽ?	5. በሰ አያምከ 6. በሳምት 7. በወሪ 8. ሀድም	

ጎልጌ 7. ዪንደቴ የልምድ (አድራጎት) ሃለት

ወ.ኢ	ሱልቸ	ለምርጨ የቀረቡ	ኢለፍ
G01	በሃሚልነታሽ ወክት ጫት ትቀሚ ናር?	3. አው 4. አሎን	
G02	አዎ በባሽ, የአቃቃም ሁኔታሽ አይነኮን ናር?	4. በሰአያምከ 5. ሀደሀደ ግን/በትቁጫጩ ሃለት 6. አለፈኢለፉኔ	
G03	በሃሚልነታሽ ወክት ሲጋረ ታጩሺ ናር?	1. አው 2. አሎን	
G04	አዎ በባሽ, የአጫጫስ ሁኔታሽ አይነኮን ናር?	4. በሰአያምከ 5. ሀደሀደ ግን/በትቁጫጩ ሃለት 6. አለፈኢለፉኔ	
G05	አልኮልነት ያለይ መጠጥ ሰቼሽ ትሸሌሽ?	3. አው 4. አሎን	
G06	አዎ በባሽ, የስኮት ሁኔታሽ አይነኮን ናር?	4. በሰአያምከ 5. ሀደሀደ ግን/በትቁጫጩ ሃለት 6. አለፈኢለፉኔ	

ጎልጌ 8. የ ቡርደ ዋ የጋር ሃለትቸ

ከዚህ በመቀጠል ስለመጠጥ ዉሃ ምንጭ እና መፀዳጃ ቤት ሁኔታዎች እጠይቅሻለሁ።

ወ.ኢ	ሱልቸ	ለምርጫ የቀረቡ ምላሾች	እለፍ
H01	የጋሪ ሰብ ኢሰቺያነይ መይ አይነካሌን?	የባንባ መይ በጋር ወስጥ……01 የአማይ የባንባ መይ……02 የጉርጋድ መይ…….…….....03 የታንከር መይ……04 የአች ዉስጥ መይ (መይ፣ ሀይቅ፣ ኩሬ……)05 ገነ በሆነ ጥቀሺ _____ 77	
H02	መዬ ለቅዶት ምን ያህላን ወክት ዮስዳን? ለቅዶት ዋ ጋር ላጂጎት?	ታድ ሳት ኮሎ…… ……..…01 ሀድ ሳት ዋ ሃቲ ኮሎ ……02 ትህንጸ አቼ ጃንጎ……...03	
H03	የመይ ማጣሪየ ትጠቀሜሽ?	አይ……..…...00 አዎ, ሁለ ግን…….....01 አዎ, ሀድሀድ ግን ……..…..…..02	
H04	ለማጣሪያነት ትጠቀሙያሙይ ምንግዝን?	አይ ……..……00 አፍሎት……01 ማንጫ/ክልሪን/ዉሀ አጋር…….……02 በጨርቅ አጣሮት…….…….....03 መይ ማጣሪያ በጠቀሞት (አሸዋ፣ ገናም)…….04 ኮሎፎኖ ኢዘቅጣነከ ባሶት…….....05 መይ ምጣሪየ ዉጣትቸ…….....06 ገነ በሆነ ጥቅሺ ……..…...……..77	
H05	ትጠቀሙያሙ ሹማት ጋር አይነት?	ቆሻሻ መተላለፉያ ያለይ መይ ማፍሰሻ ያለይ……..01 መይ ማፍሰሻይ ወደ ታንኪ ኢገባን……....02 መይ ማፍሰሻይ ወደ ጉርጋድ ኢገባን……..03 መይ ገኔት ኢፈሳን……04 አየር ማስወጫ ያለይ(VIP)… ……05 የጉድጉዋድ ክዳን ያለይ…..……..……06 የጉዴጉዋዴ ክዲን ዬለይ …….07 ቆሻሻ ያለይ……...……08 ሹማት ጋር ኤለ/በጠበ ደር..……..09 ገነ በሆነ የጥቀሱ …. ……..…..……77 ኢለዋስታውስ …….……88	
H06	ቆሻሻን ኢጢልቡያን ኡንገ	በከተማ ማዘጋጃ ጋር ኢትሲበሰባን……..……...01 ኢትቀባራን……...……....02 በግል ማህበረ ኢትሲበሰባን…….....03 ቡንገ ደር ኢጢሉያን ……..…....04 በግቢ ዉስጥ……....…..05 በሚዴ ዉስጥ …….....06 ኢማግዴን…….....07 ገነ በሆነ ይጥቀሱ …… ……..……...77	
H07	ተሹማት ጋር ዞፍ ኢንጃሙ ቲትራጦሙ?	ኢለትራጢ …….01 አዎ, በለወክት……;.....02 አዎ, አልፎ አልፎ ……03	
H08	አወ በባሽ ኢንጃሽ በምንግን ትትራጩሽ?	በሳሙነ……...…….01 Ash…….02 በቁጠል…….....……..…….03 በምንም…….……04 ገነ በሆነ ይጥቀሱ……...……77	

የስንቀ ዋስትና ሁኔታ ቤደበ ኢትሳሉይማን ሱልቸ

ወ.ኢ	የስንቅ ዋስትነ ሁኔተ	ምርጨ	ኢለፍ
I01	ባለፉይ አራት ሳምትቸ ወክት ዉስጥ የጋሪ ሰብ በቂ ስንቅ ኤለ ኢሌን ስጋት ናረሙ? የጋር ሰብ ባዬት **ቢ.ያንስ በሳምት ለአራት አያም ያይላን በአድ ጣሪያ ስር** ሀዴኞ ታንዲሮሙ ዋ ቲበሎሙ ለባይትን::	3. ኣው 4. አሎን	
I02	አዎ በሆነ ለምን ያይለን ወክት ትሰጉ ናር?	**4.** በጣም አለፈ አለፉኔ(ባለ**ፉይ አራትቸ** ሀድ ወይም ሆሸተ ግን) **5.** ሀድ ሀደግነ (ባለ**ፉይ አራት ሳ** ምትቸ ተ3 እስከ 10ግን) 6. በለ ወክት (ባለ**ፉይ አራት ሳ**ምትቸ ተ10ግን **ኢበዘ ናር**)	
I03	ባለፉይ አራት ሳምትቸ ዉስጥ አተ/ሽ ወይም ገነ የጋሪ ሰብ አባል የከሼይ **ወይም የሜጠረይ የስንቅ አይነት** ለብሎት **የአቅም** ማነስ ችግር ገጠመሙ ናር? የሜጠረይ የስንቀ አ**ይነት ባይት ማንኛዉም በምግብ ገነከ ያቀተለ የጋርሰብ ኢበላያነይ** አ**ይነት ባይትን**:: ለ**ባይትከ ቡበ**;ስ*ጋ*; አሣ; ዶሮ ወጥ ና የትሚሳሰሉ ሱር::የአቅም ኢነሶት ችግር ባይት ለ**አከቦት ዮናን ዲነት ቂበጦት ወይም** ሚጥሮት አልቻሎት ባይትን::	3. ኣው 4. አሎን	
04	አው በሆነ ለምን ያህል ወክት ትሰጉ ናር?	1. በጣም አለፈ አለፉኔ(ባለፉይ አራትቸ ሀድ ወይም ሆሸተ ግን) 2. ሀድ ሀደግነ (ባለፉይ አራት ሳ ምትቸ ተ3 እስከ 10ግን) **3.** በለ ወክት (ባለፉይ አራት ሳምትቸ ተ10ግን **ኢበዘ ናር**)	
05	ባለፉት አራት ሳምንታት ጊዜ ዉስጥ አንተ/ቺ ወይም ሌላ የቤተሰቡ አባል የሚያስፈልገዉን አቅም ከማጣት የተነሳ ዉስን የሆኑ የምግብ አይነቶችን ለመመገብ ተገዳችሁ ነበር?ዉስን የሆኑ ሲባል ተመጋቢዉ መመገብ የማይፈሌገዉ አንድ አይነት ምግብ ለብዙ ጊዜያት ለማለትነዉ::	1.ኣወ 2.አሎን	

06	አው በሆነ ለምን ያህል ወክት የትከሰት ናር?	1. በጣም አለፈ አለፋኔ(ባለፉይ አራትቸ ሀድ ወይም ሆሸተ ግን) 2. ሀድ ሀደግነ (ባለፉይ አራት ሳ ምትቸ ተ3 እስከ 10ግን) **3.** በለ ወክት (ባለፉይ አራት ሳምትቸ ተ10ግን **ኢበዘ ናር**)	

07	ባለፉይ አራት ሳምትቸ ጊዜ ዉስጥ አንተ/ቺ ወይም ሌላ የቤተሰቡ አባል አቅም ስለ**ማይፈቅድና**ሌላ ምግብ መመገብ ስላልቻለችሁ ፈጽሞ ልትመገቡ የማትፈልጉትን ምግብ ለ**መመገብ ተገዳችሁ ነበር**? ፈጽሞ ልትመገቡ የማትፈልጉት ምግብ ማለ**ት በህብረተሰቡ ዘንድ** ማይወደድና ተቀባይነት የሌላቸ**ዉ ለማለት ነዉ**::	3. ኣዎ 4. አሎን	
08	**አዎ በሆነ ለምን ያህሌ ወክትን ናር የትገደድኩሙይ?**	1. በጣም አለፈ አለፋኔ(ባለፉይ አራትቸ ሀድ ወይም ሆሸተ ግን) 2. ሀድ ሀደግነ (ባለፉይ አራት ሳ ምትቸ ተ3 እስከ 10ግን) **3.** በለ ወክት (ባለፉይ አራት ሳምትቸ ተ10ግን **ኢበዘ ናር**)	
09	ባለፉይ አራት ሳምንታት ዉስጥ አተ/ሽ ወይንም ገነ የቤተቡ አባል በቂ ምግብ ስሆ**ላሊችሁበቀንከምትመገቡት** 3 ዋናዋናምግቦችከምትፈሌጉትበመጠን ያነሰየመሰሊችሁንምግብሆ**መመገብተገዳችሁነበር**?	1. ኣዎ 2. አሎን	

I10	**አዎ በሆነ ለምን ያህሌ ወክትን ናር የትገደድኩሙይ?**	1. በጣም አለፈ አለፋኔ(ባለፉይ አራትቸ ሀድ ወይም ሆሸተ ግን) 2. ሀድ ሀደግነ (ባለፉይ አራት ሳ ምትቸ ተ3 እስከ 10ግን) **3.** በለ ወክት (ባለፉይ አራት ሳምትቸ ተ10ግን **ኢበዘ ናር**)	
I11	**ባለፉይ አራት ሳምትቸ ዉስጥ አተ/ሸ ወይም ገነ የጋሪ ሰብ አባሌ በቂ ስንቅ ለልናረሙኮ ባያም ብሎት ተናረቢ 3 ዋናዋና ስንቅቸ ኮሎ ለብሎት ተገደድኩም ናር? ለባይትከ:ተሼሸቲ ሀደይ ወይም ሀቲ በሊይ ኢደነት ባይትን::**	1. ኣዎ 2. አሎን	
I12	**አዎ በሆነ ለምን ያህሌ ወክትን ናር የትገደድኩሙይ?**	1. በጣም አለፈ አለፋኔ(ባለፉይ አራትቸ ሀድ ወይም ሆሸተ ግን) 2. ሀድ ሀደግነ (ባለፉይ አራት ሳ ምትቸ ተ3 እስከ 10ግን) **3.** በለ ወክት (ባለፉይ አራት ሳምትቸ ተ10ግን **ኢበዘ ናር**)	
I13	**ባለፉይ አራት ሳምትቸ ዉስጥ ስንቅ ለርከበት ያትኬሻን አቅም ለልናረሙኮ ሀድም አይነት ስንቅ ዋ ለስንቅ ዮናን ግዝ በጋራሙ ጠፈ ናር?**	1. ኣዎ 2. አሎን	
I14	**አዎ በሆነ ለምን ያህሌ ወክትን ናር የትገደድኩሙይ?**	1. በጣም አለፈ አለፋኔ(ባለፉይ አራትቸ ሀድ ወይም ሆሸተ ግን) 2. ሀድ ሀደግነ (ባለፉይ አራት ሳ ምትቸ ተ3 እስከ 10ግን)	

		3. በለ ወክት (ባለፉይ አራት ሳምትቸ ተ10ግን **ኢበዘ ናር**)	
I15	**ባለፉይ አራት ሳምንትቸ ዉስጥ በቂ ምግብ ለልናረኮ አተ/ሽ ወይም ገነ የቤተሰቡ አባል ምንም አይነት ስንቅ ታይመገብ ወደ መኝተ የሄደ አለ?**	1. ኣዎ 2. አሎን	
I16	**አዎ በሆነ ለምን ያህሌ ወክትን ናር የትገደድኩሙይ?**	1. በጣም አልፎ አልፎ(ባለፉት አራትሳምንታት አንዴ ወይም ሁለቴ) 2. አንድአንድ ጊዜ (ባለፉት አራት ሳ ምንታት ከ3 እስከ 10ጊዜ) **3.** ብዙ ጊዜ (ባለፉት አራት ሳም ንታት ከ10ጊዜ በሊይነበር)	
I17	**ባለፉይ አራት ሳምንትቸ ዉስጥ በቂ ምግብ ለልናረኮ አተ/ሽ ወይም ገነ የቤተሰቡ አባል ምንም አይነት ስንቅ ታይመገብ አያመይ ሙለ ዉ ዋለ ያንደረ አለ?**	1. ኣዎ 2. አሎን	
I18	**አዎ በሆነ ለምን ያህሌ ወክትን ናር የትገደድኩሙይ?**	1. በጣም አለፈ አለፋኔ(ባለፉይ አራትቸ ሀድ ወይም ሆሸተ ግን) 2. ሀድ ሀደግነ (ባለፉይ አራት ሳ ምትቸ ተ3 እስከ 10ግን) **3.** በለ ወክት (ባለፉይ አራት ሳምትቸ ተ10ግን **ኢበዘ ናር**)	

የደም ማነስመ ድኃኒት አጠቃቀም በተመሆከተ ጥያቄዎች

601	በቅድመወሊድክትትሌወቅትየደምማነስመድኃኒትተሠጥ ቶዎትነበር?የመድኃኒቱንቀሆምበመናገር/መድኃኒቱንበ ማሳየትእንዲያስታዉሊያድርጉ	አዎ አሌተሠጠኝም	1 2
602	ሆመጀመሪያጊዜመድኃኒቱንየተጠቀሙትመቼነዉ?	ከ1-3ወርበሆእርግዝናዎቅትከ3-6ባሆእርግዝናዎቅት ከ6-9ባሆእርግዝናዎቅት	1 2 3
603	በቅድመወሊድክትትሌወቅትየደምማነስመድኃኒትሆስንት ወርወስደሻሌ?	ከ1ወርሆነሰጊዜ ሆ1 ወር ሆ2 ወራት ሆ3ወራት ከ3ወራትበሊይ	1 2 3 4 5
604	በምንአይነትሁኔታነወመድኃኒቱንየምትዎስጅዉ?	በየቀኑ በየሳምንቱ በሚያመኝግዜ	1 2 3
605	በአንድጊዜምንያህሌመድኃኒትነወየሚሰጥሽ?	30 ፍሬ 60ፍሬ 90ፍሬ ከ90ፍሬየሚበሌጥ	1 2 3 4
606	በሳምንትምንያህሌየደምማነስመድኃኒትነወየምትዎስጅዉ?	ሰባትቀናት ከ4-7 ቀናት ከ4 ሊነሱቀናት	1 2 3
607	ስሆደምማነስመድኃኒትየተሰጠሽትምህርትአሆ?	አዎ የሆም	1 2
608	አዎከሆነበምንሊይነወያሰተማሩሽ?	የመድኃኒቱጥቅም ሆምንያህሌግዜመዉሰ ድእንዳሆብሽ ስሆጉዳቱ ስሆክትትሌ	1 2 3 4

ጎልጌ **I.** የእንደቴ anthropometric ሌኬት

J01	የእደት MUAC በ ሴ.ሜ	----------
J02	የእንደት ጉበ በሜትር	በሜትር ---------
J03	የእንደት Hgb(ተጨኖት ቀደ)	በ mg/dl---------

ኣሃተ ፔውዳው!!!!!!!!!!!!!

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 Faculty of Public Health in effect at the time of Grant is forwarded as the result of this application.

Name of the student: _____

Date._____ Signature _____

APPROVAL OF THE FIRST ADVISOR

Name of the first advisor: _____

Date._____ Signature _____

APPROVAL OF THE SECOND ADVISOR

Name of the first advisor: _____

Date._____ Signature _