ADDIS ABABA UNIVERSITY

COLLEGE OF HEALTH SCIENCE

SCHOOL OF PUBLIC HEALTH

EFFECT OF MATERNAL CAFFEINE CONSUMPTION ON LOW BIRTH WEIGHT IN BUTAJIRA, SOUTHERNCENTRAL ETHIOPIA: A NESTED COHORT STUDY

BY: GETACHEW BUKO HAYU (BSC.)

A RESEARCH THESIS SUBMITTED TO THE SCHOOL OF GRADUATE STUDIES OF ADDIS ABABA UNIVERSITY IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTERS OF PUBLIC HEALTH IN PUBLIC HEALTH NUTRITION

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APPROVAL BY THE BOARD OF EXAMINATION

The thesis by Getachew Buko Hayu, entitled "Effect of maternal caffeine consumption on low birth weight in Butajira, South Central Ethiopia" is accepted in its present form by the board of examiners as fulfilling thesis requirement for the degree of master's in Public Health Nutrition.

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STATEMENT OF DECLARATION

By my signature below, I declare and affirm that this thesis entitled "Effect of maternal caffeine consumption on low birth weight in Butajira, South Central Ethiopia" is my own work. I have followed all ethical principles of scholarship in the preparation, data collection, data analysis and completion of this thesis. All scholarly matter that is included in the thesis has been given recognition through citation. I affirm that I have cited and referenced all sources used in this document. Every effort has been made to avoid plagiarism in the preparation of this thesis.

This thesis is submitted in partial fulfillment of the requirement for a graduate degree from the Addis Ababa University at College of Health Sciences, School of Public Health. The thesis is deposited in the Addis Ababa University Digital Library and is made available to local, national and international scientific community. I solemnly declare that this thesis has not been submitted to any other institution anywhere for the award of any academic degree, diploma or certificate.

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BIOGRAPHICAL SKETCH

The author, Get chew Book Hay was born in August, 1986 G.C in Jed District which is found in West Shoe Zone of Roomier Region. He attended his elementary school at Shukutie primary school up to grade eight from 1994-2002 G.C, respectively. He attended his secondary school at Ginchi comprehensive secondary school from 2002 to 2005G .C.

In 2007 he joined the Hawassa University and graduated in Bachelor of Science in health officer. After graduation he assigned to work at Meta Robi Woreda, Mande Ela health center as service provider for two years and Shino health center for one year. After that he transferred to other wereda called Dendi wereda and there, he had been serving in different three health centers, Boda health center as service provider, Olonkomi health center and Ginchi health center as Director of primary health care unit.

In 2013 he rejoined College of Loadstar collaboration with Ashland University to pursue his higher education for the degree of Master in leadership and graduated in 2015 G.C. In 2017 he again joined Addis Ababa University College of health science school of public health to pursue his other higher education for the degree of public health, specialty in Public Health Nutrition.

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LIST OF ACRONYMS/ABBREVIATIONS

ANC	Antenatal Care
CHF	Congestive Heart Failure
CPY1A2	Cytochrome P450 Family 1 Subfamily A Polypeptide2
DNA	Deoxyribonucleic Acids
EDHS	Ethiopia Demographic Health Survey
GLM	Generalized linear model
HDSS	Health Demographic Surveillance Site
IUGR	Intra Uterine Growth Retardation
LBW	Low Birth Weight
MUAC	Mid-upper arm circumference
NCI	National Cancer Institutes
PTB	Preterm Birth
SGA/D	Small for Gestational Age/Date
SNNPR	Southern Nation Nationality and People Representative
SSA	Sub Saharan Africa

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ABSTRACT

Background: Caffeine consumption is common among people throughout the world, Africa and Ethiopia. The prevalence of the caffeine exposure during pregnancy was 69%-79% and excessive caffeine consumption during pregnancy was 14%-57% in most Western countries and in Ethiopia, the prevalence was 41%. The main source to caffeine is through coffee and tea in the world and African countries, including Ethiopia. Even though there were number of studies indicating caffeine intake has reported as a risk factor for low birth weight during pregnancy, the findings are not conclusive in western and no evidence in Ethiopia. Therefore, this study is designed to assess the effect of maternal caffeine consumption on low birth weight during late pregnancy.

Objective: The objective of this study was to determine effect of maternal caffeine consumption on low birth weight in Butajira Cohort, South central, Ethiopia.

Method: Population based Nested cohort study design was employed among 244 pregnant mothers from September 2018—May 2019 in Butajira. Beverages contain caffeine were collected by 24hour recall method. Birth weight was considered as outcome group. Pediatric weight scale was used for measurement of birth weight with in 72 hour after delivery. Pregnant mothers exposed to caffeine consumption greater than 200mg/day was considered as exposure group. The mean usual intake of caffeine was estimated by National cancer institute (NCI method). Finally the effect of Caffeine on low birth weight was analyzed by log binomial regression by STATA SE version 14.

Results: The study found that 26.2% of pregnant women had daily caffeine consumption more than or equal to 200mg/day. The risk of low birth weight was four times more likely to occur in exposed group than in unexposed group (ARR=3.72; 95%CI: 1.76, 7.87). In other hand, the risk of low birth weight was four, five and five times more likely to occur in middle, rich and richest wealth status at (ARR=4.61;95%CI (1.08,19.69,(ARR=5.39;95%CI (1.23,23.58),(ARR=4.54;95%CI(1.07,19.25) respectively than in poorest wealth status.

Conclusion and recommendation: In conclusion, excessive maternal caffeine consumption might results in low birth weight. Therefore, intervention that address caffeine exposure among pregnant mother should be designed to reduce the burden of low birth weight.

Key Words: Caffeine consumption, caffeine intake, low birth weight, pregnancy, effect

1. INTRODUCTION

1.1. Background

Caffeine is the most commonly used stimulant substance mainly found in coffee and tea (1). Other sources of caffeine are chocolate/cocoa, and cola soft drinks. In addition to this, nearly 200 non prescribed drugs is estimated to contain caffeine and this may be an important source for a minority of people (2).

Caffeine clearance from the body is delayed during pregnancy, especially in the second and third trimesters and it decreases to one-half and to one-third of the normal rate, respectively (3).Its half life is 2.5 to 4.5 hours in non pregnant women but doubled during late pregnancy especially during third trimester. The half life is 15- 18 hours during pregnancy.Becouse, estrogen increment during pregnancy inhibits CYP1A2 enzyme function to metabolize caffeine (4-6). until fetal blood levels are equal, maternal blood levels to caffeine crosses the placental barrier (7).The principal enzymes, cytochrome CYP1A2, needed for caffeine metabolism, however, are absent both in placenta and even up to the eighth month after delivery in infants and prone to different neonatal infection like jaundice (8).

The postulated mechanism by which caffeine consumption result in low birth weight were caffeine absorbed immediately (after 45minutes) from gastrointestinal and passes placenta across freely (9). Additionally, fetuses don't metabolize it well (10) and caffeine has been increasing catecholamine (11) which may causes utero-placental vasoconstriction and then fetal hypoxia, which possibly cause fetal growth and increases cellular cyclic adenosine monophosphate which may affect cell development and result in low birth weight (12).

Caffeine consumption in pregnant women has been studied as a determinant factor for low birth weight (13). There are studies which are done to find out the effect of caffeine consumption on low birth weight. But there are no similar results. Due to those conflicting conclusion from numerous studies, the March of Dimes, food and drug administration, American college of obstetrician and gynecologists and American pregnancy association, cable news network's and American food safety states until more conclusive studies are done, pregnant women should be limit caffeine consumption <200mg/day. But recently world health organization guidelines recommend caffeine intake during pregnancy has also been suggested as risk factor for pregnancy outcome for greater than 300mg caffeine per/day (14).

1.2. Statement of the Problem

Globally; from 127 million delivered neonates per year; more than 20 million (16%) infants are born with LBW. Of which 96.5% of them are in developing country especially Asia and Africa, including Ethiopia (15, 16), LBW babies are more likely to experience physical and developmental health problems or die during the first year of survival than infants of normal birth weight. Based on an observational studies that neonates weighing less than 2,500 g are approximately 20 times more likely to die than normal birth weight neonates (17). Because of this birth weight is considered as the sole most essential factor influencing neonatal and early neonatal mortality.

In developing countries including Ethiopia, Low birth weight is public health significance. Neonatal morbidity and mortality, particularly relating to the low birth weight babies is still high. According to National newborn and child survival strategy, Ethiopia planned to reduce the neonatal death from 28/1000 to 11/1000 live birth by 2020 even though it is unacceptably high. In addition to this mortality attributed to low birth weight in Ethiopia was 3.63 % (18).

Immediate health problems burden on LBW newborns has been relatively widely documented in many developing countries with studies of national demography (19).An estimated 13% all babies are born LBW (20-23) each year in Sub-Saharan Africa (SSA). An estimated prevalence of LBW (24) in Ethiopia was 13% and similar in SNNPR state according recent EDHS. The limitation of this survey may be underestimating the magnitude of low birth weight because it used the sampling frame of 2007 Ethiopia demographic health survey.

Previous studies have shown caffeine consumption had effect on pregnancy outcome such as abortion, miscarriage, and preterm, SGA, IUGR, and LBW. Studies were done to detect effect in western country but yet there are conflicting idea and inconclusive result.

Study done in united states shows, the risk of low birth weight was 2.3 times more likely to occur in exposed than unexposed after adjustment for confounding factors. Excessive daily caffeine intake(>=200 mg/day) has been associated with an increased risk of giving birth to SGA or LBW (<2500 g) babies (25).

Caffeine consumption was common among people throughout the world, Africa and Ethiopia (26). The prevalence of caffeine consumption in general population of most western countries was greater than 80 % (26, 27) and 69%-79% during pregnancy (28, 29). But

excessive caffeine consumption (>200mg/day) during pregnancy showed 14%-57% in community based prevalence study done in Northwest India and Ethiopia (30, 31).

To summarize, a number of epidemiological studies have explored the association between caffeine consumption and low birth weight. Some of these studies showed that caffeine consumption is associated with an increased likelihood of being low birth weight, while others report no association. Yet the majority of the evidence on this topic is from wealthy nations, and remains poorly understood in developing countries including Ethiopia. Furthermore, these studies suffer from methodological drawbacks. For example, the use of invalidated food frequency questionnaire to assess the caffeine consumption status of the study participants and failed to measure birth weight within three days. Our review suggests that studies that use objective measurement of caffeine consumption by 24 hour recall method for all study participants and repeated measurement was also considered to adjust usual caffeine consumption by National cancer institute (NCI) method.

Additionally, no conclusive result and single local study on effect of caffeine consumption on low birth weight even though the main source of caffeine called coffee; its homeland was Ethiopia; were produced and consumed well. Its prevalence was higher than world prevalence and 50% cases of low birth weight causes were not known and expenditure needed to treat one neonate accounts 56,000 USD dollars, very expensive while treatment than intervention (32).

1.3. Significance of the Study

The amount of excessive caffeine consumption during pregnancy in Ethiopia was studied but there was no any evidence that shows caffeine consumption affects low birth weight in Ethiopia context. Addition to this if caffeine consumption result in low birth weight, intervention planning might be done at low cost effective to reduce neonatal mortality and morbidity. Evidences generated from this research may contribute to develop dietary guideline. Furthermore, the finding of this research might help health professionals, for nutritional counseling for community at large and to policy maker for decision making.

2. LITERATURE REVIEW

2.1. Prevalence of Low Birth Weight

Globally, 127 million neonates were born; at least 20 million infants are born every year with LBW, representing about 16% of all newborns in developing countries (33). Almost 80% of all affected neonates with LBW at term are born in developing countries (especially south-central Asia, with Bangladesh with the highest incident rate in the world (34); fifty percent and eleven percent are born LBW at term in middle and western Africa respectively, and seven percent in region of the Caribbean and Latin American (35). The prevalence of low birth weight in Ethiopia is 13% and in SNNPR is 13.1%(24). Incident rates of >15% for LBW and >20% for IUGR indicate that LBW at term is a major public health significance. Therefore, Population-wide interventions planned at preventing LBW at term are immediately required (36).

At the population level, the proportion of infants with a LBW is an indicator of a multidimensional public-health problem that includes chronic maternal malnutrition and poor health service in pregnancy whereas on an individual basis, LBW is an important speculations of newborn health and survival and is associated with higher risk of infant and childhood mortality (37). LBW relates to IUGR and PTB which are two distinct processes with differing consequences and etiology.

2.2. Consequence of Low Birth Weight

Low birth weights are associated with early mortality and morbidity and with adverse long-term outcomes. Neurological complications such as periventricular leucomalacia, Cerebral Palsy, Seizures, delayed development, and learning difficulties are the long term consequences of LBW. Bronchopulmonary dysplasia, recurrent wheezing with respiratory infections are, mild neurocognitive deficits Pulmonary outcomes and retinopathy and blindness, small permanent deficits in weight and length and increased risk of hypertension, diabetes in adult life and coronary heart disease are ophthalmologic complications (33).

2.3. Determinants of Low Birth Weight

In nearly fifty percent of cases, the cause of low birth weight is not known (32).In remaining fifty percent the causes are grouped into (32) Social and medical factors. Medical factors can be maternal factor like socio demographic factor (maternal nutrition, maternal height and weight, education, age, marital status and socio-economic status, physical activity of

mothers); placental factors like congenital defects of placenta and fetal factor like multiple gestation, congenital anomaly, and intrauterine infection. The other is social factor such as poverty, (infection and environment) like poor standard of living, early marriage; toxic exposure like (Chat chewing, alcohol consumption, tobacco chewing, and cigarette smoking). Excessive (greater than 200mg/day) caffeine intake during pregnancy has also been suggested as a risk factor (38).There exists more clarity when it comes to the infant and health factors.

2.3.1. Infant factor

2.3.1.1. Multiple pregnancies and congenital anomaly

Epidemiological study revealed that multiple pregnancy contribute substantially to LBW and the prevalence of LBW in babies born in singletons was 24.4% and in multiple births was 93.7 % (39).Approximately 3-4% newborn infants had a major birth defect diagnosed during their first year of life (40).Because many infants with birth defect are born prematurely and/or have intrauterine growth retardation or LBW (41-44), the rate of birth defect is expected to vary by birth weight.

2.3.2. Obstetric factors

A number of obstetric factors have been tested in the empirical literature for having a direct and independent effect on birth weight. Obstetric factors investigated in the literature include pathology of placenta (abruption placenta, placenta previa), parity, birth or pregnancy interval (multiple pregnancies in short intervals), intrauterine growth and gestational duration in prior pregnancies (i.e., previous LBW neonates), previous spontaneous and induced abortion, previous stillbirth or neonatal death, and previous infertility. Generally, incidence of LBW is higher among primiparous women of age group below 20 and above 35 years as well as older age of primiparous mothers has also been reported as determinant factors of LBW (45-48).

There were also observed lower birth weights following a pregnancy interval of< 1 year (49). This is mainly related to maternal nutritional status. If a mother cannot recover fully from the effects of her last pregnancy and period of breast feeding before becoming pregnant again her nutritional status might deteriorate sufficient (nutritional depletion) to result in an increased risk of premature birth and LBW babies (46, 50, 51).Previous IUGR and gestational duration in pregnancies was a determinant factor for prematurity or LBW (52).

2.3.3. Maternal morbidity during pregnancy

2.3.3.1. General morbidity and episodic illness

Common episodic illnesses and symptoms, such as upper respiratory infections, fever, nausea, vomiting, diarrhea, headache, and anorexia during pregnancy, could affect intrauterine growth or gestational duration through any of three (33) mechanisms. Firstly, such symptoms often result in decreased caloric intake, which, if prolonged, could lead to a reduction in the energy available to the fetus and, in women who have inadequate nutritional reserves, impair fetal growth. Secondly, the metabolic cost of maintaining febrile temperatures or of mounting appropriate host defenses may reduce the energy available to the fetus, even with a constant dietary caloric intake. Finally, the infection or symptom could lead to diminished uterine blood flow or even spread to the placenta or amniotic fluid and hence interfere with intrauterine growth or precipitate premature delivery.

2.3.4. Socio-demographic factor

2.3.4 .1. Gestational weight gain and height

During pregnancy increments by weight would be expected to affect IUGR. Gestational weight gain has four principal components: stores of fat; growth of breast and uterine tissue; increased plasma volume; and growth of the fetus, placenta, and amniotic fluid (53).Only the first of these serves as an energy source to the growing fetus. None the less, an association might be expected between overall weight gain and birth weight. Since growth of the fetus, placenta, and amniotic fluid includes, and is largely determined by, fetal size, attempts to associate gestational weight gain with birth weight should ideally subtract the birth weight and the weights of the placenta and amniotic fluid from the overall gestational weight gain. (52).

Maternal height might be associated with LBW even though it is not completely understood how. This may be contributed by both genetic and environmental factors. Short-statured women are more likely to pass on to their fetus a genetic predisposition for smaller growth (54). Anatomical factors may also play a role in the risk, as short stature can be associated with a smaller uterus, and can therefore impose physical limitations (55) on the uterine, placenta and fetuses growth. Furthermore, height is correlated to pelvic size, and therefore, a short-statured woman may have a smaller pelvis, which may result in its earlier

filling(54).Maternal short stature may also be associated with a lack of nutrients, resulting in decreased fetal growth or duration of gestation, (55).

2.3.4.2. Maternal education

High maternal literacy (university and above) a showed a 33% protective effect against low birth weight, whereas medium degree of education showed no significant prevention when compared to low maternal literacy. In summary, the hypothesis of similarity between the high degrees of social distribution, translated by maternal education level in relation to the rate of low birth weight, was not confirmed (52, 56).

2.3.4.3. Maternal age

Pregnancy outcomes, including birth weight and gestational age, are generally less favorable among adolescents and women over 35 years of age; however, there is considerable controversy as to whether age itself is an independent determinant of either intrauterine growth or gestational duration. Age is closely associated with parity, which must therefore be controlled in attempts to isolate the independent impact of age. Furthermore, young adolescents (those within 1 or 2 years of menarche) have not completed growing, are likely to have a lower weight-for-height than older women, and may consume fewer calories and other nutrients. Because their pregnancies are often unwanted or unplanned, they are often late in seeking antenatal care. Increased cigarette smoking, alcohol consumption, and drug use among teenagers may also put them at risk of delivering low birth weight (52).

2.3.4.4. Marital status

Unmarried female are more likely to be young, have low literacy level, smoke during pregnancy, from minority race, and start antenatal care late. Within almost every determinant factor category, unmarried women have a higher percentage low birth weight. For example, at less than grade nine, unmarried women had a low birth weight percentage of 12.3 compared to 7.9 for married females of the same educational level, this align with unmarried women are almost two times as likely to have a low-weight birth (57).

2.3.4.5. Socioeconomic status

Women of low socioeconomic status in developed countries are more likely to be members of racial/ethnic minorities and may be more likely to smoke cigarettes, have shorter birth intervals, make less use of antenatal care, and have a higher incidence of systemic and genital

tract infection. In developing countries, such women are likely to be shorter and thinner and to consume fewer calories and other nutrients during pregnancy. Thus the absence of an independent effect of socioeconomic status does not rule out its role as an indirect cause of prematurity or IUGR (52).

2.3.5. Antenatal care and low birth weight

Studies show that ANC visit, total number of ANC visits, iron and calcium supplementation during pregnancy are the significant predictors of LBW (58-60).

A cross-sectional study conducted in Kenya indicated a significant association between weight of the previous baby, premature rapture of membranes, premature birth and low birth weight (61).

This finding is similar to a cross-sectional study in Gondar in which history of preterm delivery or small baby preterm delivery and inter pregnancy interval below two years was among factors associated with LBW (62).

2.3.6. Toxic exposures and low birth weight

2.3.6.1. Overview of toxic exposure

The last category of factors affecting birth weight relates to maternal exposure to toxic elements including caffeine, alcohol consumption, Chat chewing ,cigarette smoking and other toxic exposures (50).Socio demographic factors, obstetric factors, neonatal factors and environmental factors, like pollution are among the commonest findings. Therefore, this study will focus to investigate some of the toxic exposures like caffeine, alcohol consumption, Chat chewing, cigarette smoking. This study may have significant input in identifying some of the factors and improving the condition of the mother.

2.3.6.2. Caffeine and low birth weight

Caffeine is defined a plant alkaloid occurred mainly in coffee, tea. Other source also cola soft drinks and cocoa (63). It is the most commonly used mild stimulant substance in the world (64). while ingestion, caffeine is rapidly absorbed and readily crosses the placental barrier (65, 66).

The main enzyme (cytochrome P450 1A2) involved in caffeine metabolism is absent in both the placenta and in the fetus Up to eight month after delivery which can lead to caffeine

concentrations in fetal tissues (27,65, 67). The caffeine half-life doubles in pregnant women as the proportion of caffeine metabolism decreases from the first to third trimester (68, 69). Clearance delayance of caffeine leads to higher exposure to caffeine for the fetus. Exposure to caffeine can also lead to vasoconstriction in the utero-placental circulation, which may in turn affect fetal growth and development (70, 71).

Coffee alone would account for 4% of cases of low birth weight (72). In a meta-analysis, which included 13 prospective studies, the risk of having low birth weight was high for high caffeine consumption compared to moderate and low consumption. It has been established that each 100-mg/day increase in maternal caffeine intake (about one cup of coffee) was associated with 13%greater risk of having low birth weight (73).

2.3.6.3. Alcohol consumption and low birth weight

Even in the absence of the full-blown fetal alcohol syndrome -consisting of growth retardation, cognitive defects, short palpebral fissures, and maxillary hypoplasia maternal alcohol intake during pregnancy might adversely affect intrauterine growth retardation. In experimental animals the fetal growth inhibiting effect of alcohol has been amply demonstrated when high doses are administered, and the mechanism may involve fetal hypoxia or decreased building of amino acids into protein (74).

2.3.6.4. Chat consumption and low birth weight

Effect of Chat on reproductive function is not known well. The noted effect of chat was vasoconstriction in the utero-placental vascular bed, impairing fetal growth through reduction of placental blood flow among pregnant guinea pigs fed chat leaves (75). They also showed increment in the pressure of utero-placental blood by twenty five percent and heart rate by nine percent and contrarily a reduction of myo-endometrial blood flow by thirty one percent other studies also reported association between chat chewing during pregnancy and reduced daily food intake, anemia, and disturbance of fetal growth, Low birth weight, perinatal and infant death, and other obstetric health problems (75).

2.3.6.5. Cigarette smoking and low birth weight

Smoking accounted for 35% of cases of low birth weight (72).Maternal cigarette smoking could affect intrauterine growth (and possibly gestational duration) through several mechanisms (76). The most likely factors are CO and nicotine. Carbon monoxide can

interfere with oxygen delivery to the fetus in two ways: by displacing oxygen from hemoglobin, and by shifting the oxy-hemoglobin dissociation equilibrium to the left, so that less oxygen is released to the fetal tissues for a given partial pressure of oxygen (33) . Nicotine is an appetite suppressant and is believed to result in rapid increases in maternal catecholamine and consequent uterine vasoconstriction. Tobacco smoke also contains cyanide compounds, and a third possible mechanism for a smoking effect involves cyanide-mediated interference with fetal oxidative metabolism (33).

In summary, Articles which were directly related to this title were reviewed on effect of caffeine consumption on low birth weight. Studies were randomized double blind control trial, cohort study design, case control study and cross sectional study design.

The randomized double blind control trial study done on effect of caffeine reduction on birth weight and length of gestation on cases 568 as caffeinated coffee and control of 629 as decaffeinated coffee on a total participant of 1207 pregnant mother drinking at least three cup of coffee a day recruited before 20 week of gestation shows that no significance difference was found for mean birth weight and mean length of gestation between women of decaffeinated coffee group; whose mean caffeine intake was 182mg/day less than that of other group and women in caffeinated coffee group.

Being adjusted for potential confounder like length of gestation, parity, pre pregnancy BMI and smoking at entry to the study the average birth weight of babies born to women in the decaffeinated was 16g (95% confident interval -40 to 73) higher than those born to women in caffeinated group. This may be a possible effect of caffeine in the first half of pregnancy remained unsearched. Secondly, only a difference in three cups of coffee (approximately 240mg of caffeine) was studied, while others observe an effect above 300mg/day according to WHO guideline. On another hand, small intake of caffeine by caffeinated group; mean of 182mg/day caffeine is not enough to detect the difference of birth weight and length of gestation between the two groups (4).This study was consistent with the recommendation of Marches of Dimes , American college of obstetrics and gynecology, American pregnancy association , Food and drug administration which proposed less than 200mg/day caffeine was save and later WHO recommend up to 300mg/day caffeine had no risk on pregnancy outcome until the evidence was updated .

Another cohort studies which were done at different western country some of them didn't find out any associations between caffeine consumption and low birth weight. This may be

due to, few studies measured birth weight at four week after delivery, this may be increase n birth weight (77). Other prospective cohort study done in1995 at London was due to heterogeneity of the subjects because of different sub ethnic group involved in the study (78).The other prospective population based cohort study was done to examine the associations of maternal caffeine intake, on the basis of coffee and tea consumption, with fetal growth factor measured in each trimester of pregnancy and the determinant of adverse birth outcomes and no positive relationship was found in first two trimesters but there was association in the third trimester for caffeine intake >6unit/day (79).

Another study which was done during pregnancy on caffeine consumption was not associated with gestational length but with birth weight. A large prospective observational cohort study reported caffeine consumption was constantly associated with decreased birth weight and increased odds of SGA. This might be due to validated food frequency questionnaire was used with large sample size (59,123) pregnant women and it was the largest study performed so far on the relation between caffeine consumption and birth outcome (5) .

The case controls, some of them found out there were no association between caffeine consumption and low birth weight. This is may be due to computer-assisted telephone interview which may be social desirability, difference method of caffeine measurement like high performance liquid chromatography and recall bias on exposure variable measurement. Furthermore gestational age was confirmed by ultrasound examination at the 20th week of gestation once by crown rump length in case controls. May be due to this the studies didn't find out association between caffeine consumption and low birth weight. In other case controls found out association between caffeine and low birth weight, measure outcome of interest twice, once before 20 weeks by cown rump length and after 20 weeks by using femoral length (80). In addition, only a few cross-section studies design of some didn't find out association, this may be due to poor design to detect effect of caffeine consumption on low birth weight (30). Some of the studies have adequate power but few of them could not be checked.

Generally there was no study done by quantative methods; 24 hour recall method for data collection for caffeine consumption, instead different studies had used qualitative; food frequency questionnaire. Therefore, in order to get accurate caffeine consumption by 24 hr recall method as our local context measurement tools of caffeine and by using cohort study

design to prevent recall bias and consider caffeine contents of beverages and other factors as confounder like chat and alcohol that are result in low birth weight.

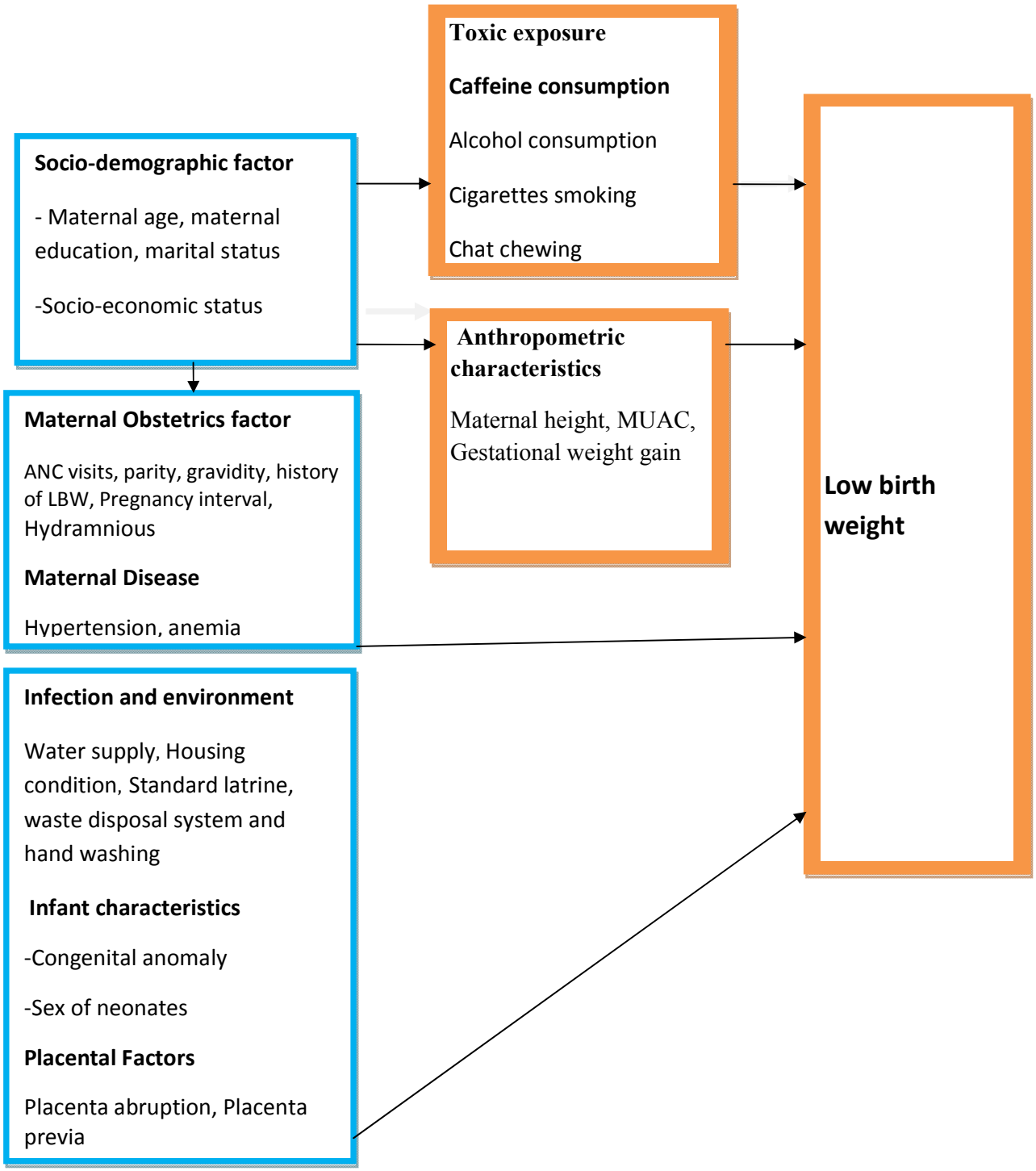

Figure 1: Conceptual framework of risk factors for low birth weight adapted after literatures review

HYPOTHESIS

HA: - Excessive caffeine consumption positively associated with increased risk low birth weight.

3. OBJECTIVES

3.1 General Objective

The aim of this study was to determine the effects of maternal caffeine intake on low birth weight in Butajira health and demographic surveillance site from September 2018-May 2019.

3.2 Specific Objectives

The specific objectives of this study were:-

- To determine the effect excessive (≥200mg/day) caffeine consumption during pregnancy on low birth weight.
- To assess prevalence of excessive caffeine consumption in the community.
- To assess the Incidence of low birth weight in the community.

4. MATERIALS AND METHODS

4.1. Study Area and Period

Study was conducted from September, 2018-May, 2019 at Butajira Rural Health Program (BRHP), Butajira demographic surveillance site, SNNPR region and southern central of Ethiopia by Addis Ababa university school of public health. SNNRP has 15 zones. Gurage zone is one of the 15 Zones. This sites located surrounding Butajira city which are 7 kebele in misken wereda, 2 kebele in mareko wereda in Gurage zone and 1 kebele in Silte wereda of silti zone, 135 km to south from capital city of Addis Ababa, Ethiopia with an altitude of 1,500m-3500m above sea level. Totally, it contains often surveillance villages (one urban and nine rural kebeles). Which were sampled in 1986 by probability proportional size technique from 82 rural and 4 urban kebeles of Gurage and silti Zone, in the SNNPR state.

It is located HDSS of Mesken, Marako district in Gurage zone and Silte district in Silti Zone. Based on 2007 Central Statistical Agency census result, the majority of the inhabitants were Muslim, followed by Orthodox Christianity and Protestant in religion and Gurage in Ethnicity. Guragigna and Amharic are the local and national working languages respectively. It has three Agro-ecologies (lowland, midland and highland). Maize, sorgum, false banana (Ensete) and stew made from kale (cabbage) are their stable food in the area. The site has total population 80,656; male 38,714 and female 41,941 and expected current pregnant mothers are 1580 by 2% conversion factor.

4.2. Study Design

Community based prospective Nested cohort study design was employed among pregnant women in Butajira HDSS, south central SNNPR state. It was under cohort who has already established by Addis Ababa University College of Health Sciences School of Public Health: a mother-child cohort study, Addis Ababa university thematic research, in Butajera, southern Ethiopia for 3years 2017/2018-2020. The main objective of this cohort was to evaluate the effect of economic, psychological and quality aspects of food and nutrition on pregnancy outcomes, child growth and development. The plan of established cohort was a population based prospective cohort employed among 1419 pregnant women of reproductive age group and their children under the age of two years. Measurements in this study include; dietary consumption, anthropometric, biochemical, food price, access and availability, food contaminates, aflatoxins, chemicals and heavy metals. The cohort employed qualitative method to explore drivers of food choice. Addis Ababa University on assessment of effect of

caffeine consumption during pregnancy on low birth weight aligns with food and nutrition and the effects on pregnancy outcomes.

4.3. Population

4.3.1. The source population

Source populations of the study were all pregnant women living at BRHP.

4.3.2. Study population

Randomly selected pregnant mothers whose gestational age ≥12 weeks estimated by ultrasound who entered to the cohort and fulfils inclusion criteria.

. 4.3.3. Eligibility criteria

4.3.3.1. Inclusion criteria

All 2nd and 3rd trimester pregnancies that are reside in Butajira HDSS during selection of study participants and entered to pregnancy cohort between February 2018–November 2018 and who are willing to participate in the study.

4.3.3.2. Exclusion criteria

Known medical problems (diabetes, hypertension, chronic renal disease, congestive heart failure, Multiple pregnancy), women who plan to move out of the area before delivery were excluded.

4.4. Sample Size Calculation and Sampling Procedure

4.4.1. Sample size calculation

The required sample size of eligible participants for the study was determined by using double Population proportion formula.

Sample size was calculated by statcalc epi info version 7 with the following assumption

Sample size determination assumption

Two sided confidence level 95%, power of 80%, ratio of unexposed to excessive caffeine exposed 1:3, Percent of outcome in unexposed group 13.1%(24) and OR of 3.05 (81) 57

exposed group and 169 unexposed group with 15% non response rate=226*0.15=35 , 8 was allocated to exposed and 27 was allocated to unexposed group.

Finally a total of 261 pregnant mothers participated in the study. 65 exposed, 196 unexposed.

4.4.2. Sampling procedure

Figure 2: shows the sampling procedure for this study. A simple random sampling technique was applied to select the study subjects. Addis Ababa University College of health science school of public health established pregnancy –child cohort to screen pregnant mother of 1419 from 2017 to 2020. The aim of this cohort was to evaluate the effect of economic, psychological and quality aspect of food and nutrition on pregnancy outcome, child growth and development. For this study 776 eligible pregnant mother screened from February 2018 to November 2018 was the sampling frame. Only second and third trimester was selected based on inclusion criteria. 258 of them had no caffeine data; 217 of them were first trimester pregnancy; two were multiple pregnancy.299 eligible pregnant mothers were considered as sampling frame. 93 pregnant were exposed group 206 of them were unexposed group. By using simple random sampling 65 exposed and 196 unexposed pregnant mothers were selected. Both groups were followed for 8 month. At the end of 8 month 64 exposed and 180 unexposed completed follow up period and included in to analysis. Figure 2 showed the sampling procedure.

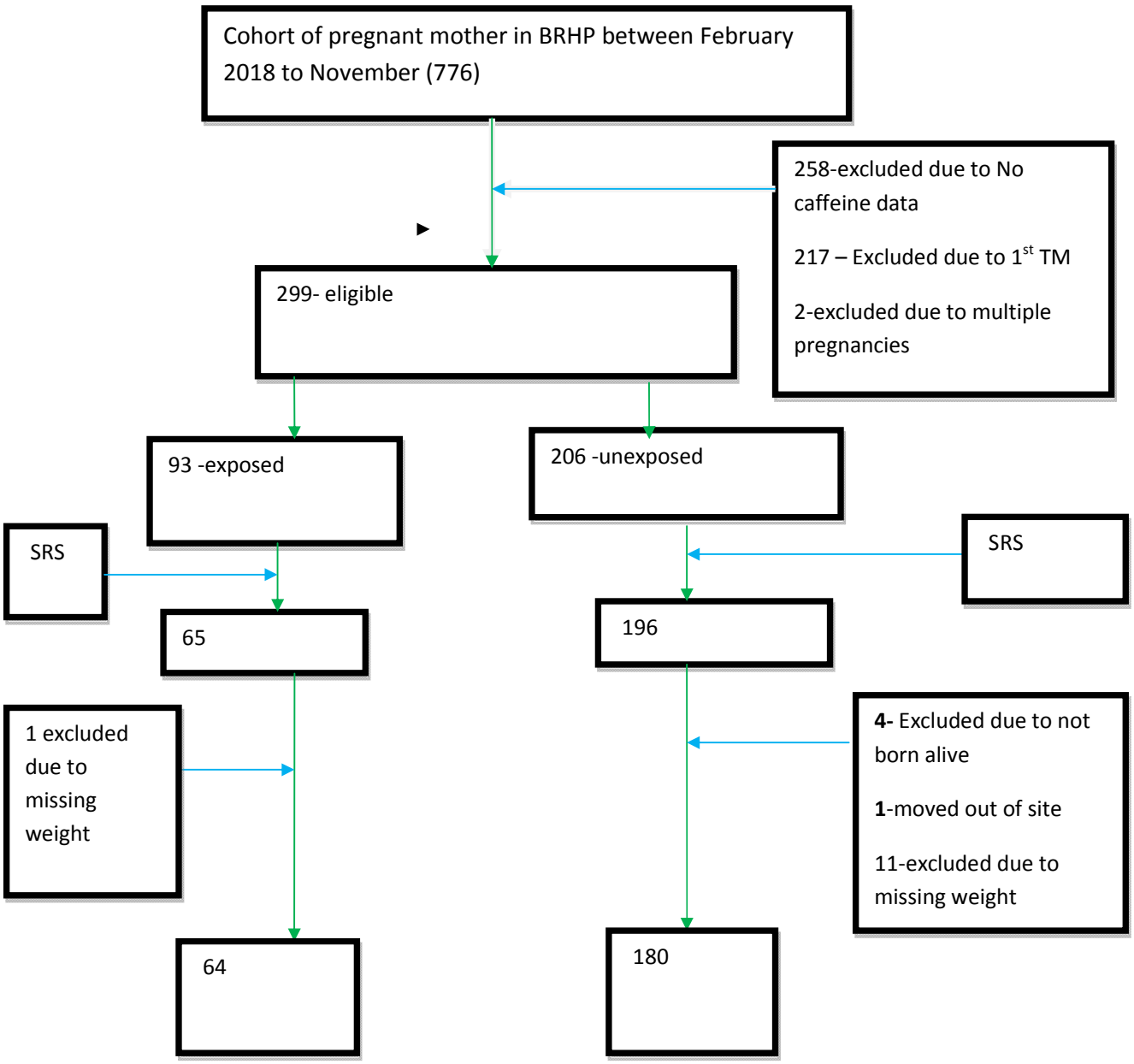

Figure 2: Diagrammatic presentation of sampling procedure

4.5. Data Collection Methods and Procedure

4.5.1. Data collection methods

Socio-demographic characteristics of the participants were assessed using questionnaire that included questions on pregnancy interval, and education level of mother and obstetric history and reproductive variable (parity, gravidity, history of LBW). Since the study participants

were Amharic speakers, the questionnaire was first prepared in English and it is translated in to Amharic and back to English to keep its consistency.

Anthropometry measurements were used to measure weight, height, MUAC and blood pressure of the mothers and birth weight for neonates.

Biochemical measurement was used by Hemo-Cue to determine hemoglobin level of mothers.

4.5.2. Data collection procedure

Data was collected using structured face to face interview questionnaire which was comprise socio- economic , demographic characteristic of the mothers, reproductive variable (parity , gravidity, history of LBW), substance use (caffeine consumption, smoking, chat chewing, and alcohol consumption) , self-reported diseases and health conditions associated with exposure and outcome (high BP, DM, diagnosed renal disease ,CHF)

Anthropometrics measurement and hemoglobin level of the mothers were measured by the data collectors using calibrated equipment and standardized techniques. Mothers were wearing light closes during weight measurements .Weight was measured using standard digital balance with a precision of 0.1 kg (Seca product). Height was measured in the standing position by portable stadiometer with a precision of 0.1 cm for pregnant mother. Pregnant mothers were asked to stand without shoes back against the scale, heels together and head in the upright position. The movable head board was lowered until it touches the upper part of the subjects head firmly. MUAC is measured from left arm by adult tape meter. After each pregnant mother takes rest for five minutes, Blood pressure was taken 3 times by digital sphygmomanometer, first measurement was discarded and average of the last two were taken for systolic and diastolic blood pressure

4.6. Measurement of Study Variables

4.6.1. Exposure Variable

Caffeine measurement

Caffeine measurement was done for all study participants in second trimester and repeated for 51(21%) study participants in third trimester by using 24 hr recall methods for collect beverages like tea, coffee, soft drinks to know amount of caffeine consumption of individuals. All days of the week were considered in the sample to make the selection representative for both first and repeated measurement. If the material was not available at home, the picture of calibrated serving size would be shown to the mother to estimate the amount consumed. Then, the participant was asked to indicate how many of each size of the beverages consumed in the last 24-hour. The daily 24-hour recall consumption amount of caffeine was changed in to a standard unit (mg).

The amount of caffeine collected by milliliter (ml) was converted to milligram (mg) by multiplied with average content of caffeine per unit of each caffeine source. The average amount of caffeine from coffee (0.533 mg/ml) was obtained from a study conducted in Ethiopia (82). The caffeine concentration for tea (0.359 mg/ml) and coca cola (0.113mg/ml) was obtained from the International Food Information Council Foundation (IFICF) critical review on clarifying the controversies of caffeine and health (83). To obtain the caffeine amount from coffee with milk was estimated. The estimated proportion of coffee in coffee served with milk was 0.7365(84). Then the caffeine level was calculated based on the caffeine level in coffee as shown above. Finally Caffeine was categorized using scales ranging 0) normal (caffeine consumption less than 200mg/day), 1) excessive (caffeine consumption greater than or equal to 200mg/day).

4.6.2. Outcome variable

Birth weight measurement

Birth weights of the neonates were measured by digital weight scale after delivery within three days following standard procedure and techniques. Birth weight was categorized using scales ranging 0) Low birth weight (weight less than 2500gram,1) normal (birth weight greater than 2500gram).To ensure measurement accuracy the scale was checked for 0.00 reading and calibrated before each data collection. Small for gestational age was calculated

using First trimester ultra-sound. The date of delivery was estimated by First ultrasound which was accurate measurement compared to second and third trimester ultrasound. Term pregnancy by ultrasound was 38 weeks to 42 weeks (266-294days) was calculated by subtracting expected date of delivery from date of birth by using SPSS version 20. Pregnancy less than 266 days were considered as preterm, between 266- 294 days as term and 294 and above as post-term pregnancy.

6.6.3. **Covariate variables measurements**

Socio demographic and economic characteristics

Socio demographic characteristics such as age, sex, occupation, educational status and marital status which were adapted from Ethiopian Demographic Health Survey (EDHS) were included. Age was categorized using scales ranging:1) 15-24 , 2) 25-34,3) 35 and above years old. Occupation was categorized using scales ranging:1) Farmer and housewife, 2) Housewife, 3) employee/private,4)Student,5)Merchant,6) Local drink seller, 7) Commercial sex worker,8)Maid servant,9)Daily laborer, 10)Unemployed,11) Farmer and merchant ,99)Other (specify). Educational status was categorized using scales ranging: 1)Primary (1-8),2)Secondary(9-12),3) College/university,4) Read and write,5) can't read and write wealth index was assessed by principal component analysis using scales ranging.1) poorest,2) poor,3) middle,4) rich, 5) richest.

Obstetric factors

Obstetric factors like ANC follow up was categorized using scale ranging: 0) yes, 1) no. Gravidity was categorized using scale ranging 0) primigravida, 1) Multigravida. Parity was categorized using scale ranging: 0) Null Para, 1) Para I, 3) Multipara. Pregnancy interval was categorized using scale ranging: 0) less than 18month, 2)18-33month, 3) 33 month and above. Pregnancy plan was categorized using scale ranging: 0) planned 1) unplanned.

Substance use (chat chewing)

Participants‟ toxic exposure use was assessed using questions adapted from EDHS. Participants were asked whether or not they use the substances with a response category of „yes‟ or „no‟ and the frequency (number of days) and amount (for cigarette) of their consumption

Placental factors (placenta abruption, placenta previa, and hydramnious) and infant congenital anomaly were using ultrasound (yes/no).

Anthropometric measurements

Height of the mothers was measured by portable stadiometer and categorized using scale ranging: 0) normal height (>=150cm), 1) short stature (<150cm).

MUAC was categorized using scale 0) normal (MUAC >=22cm and above), 1) malnourished as (MUAC<22cm), Blood pressure categorized using scale ranging 0) not hypertensive (<140/90mmhg) 1) hypertensive (≥ 140/90mmhg).

Biochemical measurement

Hemoglobin level of the mothers categorized using scale ranging: 0) anemia (less than 11mg/dl, 1) not anemia (greater than 11mg/dl).

Maternal Disease like Hypertension was measured as (yes/no) and toxic exposure (cigarette smoking, alcohol consumption) was not included in this analysis because no pregnant mother faced to those factors.

4. 7. Data Quality Managements

Data quality control was done before, during and after data collection. Five days onsite training was given for the experienced and fluent in local language, five local data collectors and two supervisors by the principal investigator while data collection on weight measurement of newborn. Data collection takes a total of eight month duration which was conducted from September, 2018-May, 2019.

Measurement scales were checked whether the scales were at 0.00 reading before each measurement. Technical error of measurement for height, weight and MUAC should be checked for acceptable range. Less than 0.5kg for weight, 0.5cm for mid arm circumference, and <1cm for height. Five milliliter of blood sample was taken from left brachial vein of pregnant mother to detect anemia by using hem cue following standard procedure by experience laboratory technicians.

Five days before interview principal investigator visited 10 household to collect data on caffeine for pregnant mother's tool used to drink coffee and tea and photo of equipment commonly used were taken. The equipment/cup/ was graded in to 1-3 after making coffee or

tea during baseline assessment based on their size one for small, two for middle and three for large. Accordingly the equipments cups from the pictures were purchased from local market and used to use while data collection for pregnant mothers household who study unit is reside in. The amount of beverage which has caffeine was collected from second and third trimesters pregnant women house to house once by using 24 hour recall methods for all study participants. Additionally exposure measurement was repeated by data collectors for fifty one pregnant mothers which account for twenty one percent to reduce with in person variation. Then the amount of beverages collected was converted to caffeine concentration by using already published article done in Ethiopian coffee and for tea and soft drinks from international caffeine concentration level reference.

The Supervisors and the principal investigator gave close supervision during different phases of data collection (interview, anthropometric measurements and documentation).Questionnaires were checked by the supervisors and the principal investigator for completeness each day. Editing and cleaning of data was done before data analysis.

4.8. Operational and definition of terms

Birth weight: weight of fetus or newborn from delivery to three days.

Neonates: a newborn child less than a month old.

Low birth weight: Birth weight of 2499g or less, regardless of gestational age and delivered within the first three days.

Intrauterine growth restriction: Birth weight less than 2500g and gestational age greater than 37 weeks.

Small for gestational date/age: weight below the10th percentile for gestational age.

Unexposed /Low or no caffeine in intake/:-Consumption of caffeine below 200mg/day or no consumption.

Excessive caffeine intake/ Exposed group/: - intake of caffeine greater than or equal to 200mg/day.

Heavy caffeine consumption: - intake of caffeine greater or equal to 300mg/day.

Short stature: - height less than 150cm.

4.9. Data Management, Analysis and Presentation

The data was checked for completeness, edited and entered in to Epic Info version7 and imported to STATA v14. The data was sorted, tabulated, summarized, cleaned and analysis was done.

Principal Component Analysis was done to construct wealth index based on household data such as ownership of household including household fixed assets, type of house and its building materials, agricultural land ownership, animal ownership, source of drinking water, ownership and type of toilet facility, having domestic servant, and saving account. Assets owned by less than 5% or more than 95% of households were excluded from wealth index construction.

Descriptive analysis was undertaken and expressed in table, graph and percentage. The normality of age and caffeine data was checked using histogram with normal curve and Shapiro walk test p-value.

The mean usual intake of caffeine was estimated using the NCI method; which was used to estimate usual intake caffeine consumed daily by nearly all pregnant mothers.

Bivariate log binomial regression was done to investigate the association between explanatory variables and outcome variable. Variables with P-value < 0.25 on the bivariate log binomial regression analysis and important variables for the objective of the study based on literature review were entered to the multivariate log binomial regression model. Multivariate log binomial regression was run and the differences between variables were explored.

Post study power was calculated by open epic it is 88.35% which indicated adequate power. Multicollinearity of the independent variables was also checked by variance inflation factor (VIF) and no variables had VIF of greater than eight. Statistical significant was considered for variables with p-value of less than 0.05.

At the end, the findings were described in text, percent, risk ratio (RR) and presented using frequency tables, and charts.

4.10. Ethical Consideration

The ethical clearance was obtained from Addis Ababa University School of Public health after approval of by research ethical committee. The verbal Consent was obtained to confirm volunteerism from study participants and confidentiality and privacy of the participants was kept by coding data. The direct benefit for participating in this study was free rendered ultrasound service and hematology test.

Their participation was voluntary and they were not obligated to answer any question they didn't want to answer. If they felt discomfort with the interview, they could with draw any time after they get involved in the study. They could take time to understand and decide on their participation in the study. Their name was not written in this form and was never used in connection with any information they tell us. All information given by them was kept strictly confidential and the duration of interview for dietary assessment took about 15---20 minutes and for neonate birth interview it took 10-15 minutes.

4.11. Dissemination of the Result

The result of this study may be presented to school of public health, college of health science, Addis Ababa University as parts of Masters of public health in nutrition thesis. Efforts may be made to present the result to scientific conference and peer reviewed journal publication.

5. RESULTS

5.1. Socio-Demographic and Economic Characteristics of the Respondents

Out of 261 pregnant mothers approached, 244 of them were interviewed, with attrition rate 92%and 98% for unexposed and exposed respectively. Table 1 shows the socio-demographic and economic characteristics of the respondents. The median age in unexposed was 28(IQR=5) whereas in exposed was 26.5(IQR=7). All unexposed and exposed (100%) of the respondents were married.

Table 1: Shows the socio-demographic and economic characteristics of sampled pregnant mothers who lived at BRHP, Gurage, Zone, SNNPR, Ethiopia, 2019

Variables	Caffeine intake (<200mg/day)		Caffeine intake (>=200mg/day)	
	Number(n)	Percent (%)	Number(n)	Percent (%)
Age group				
15-24	43	23.89	23	35.94
25-34	114	63.33	36	56.25
35 and above	23	12.78	5	7.81
Education status mothers				
No formal education	79	43.89	29	45.31
Primary level	92	51.1	27	42.19
>=Secondary level	9	5	8	12.50
Religion				
Orthodox Christian	37	20.56	6	9.38
Muslim	132	73.33	53	82.81
Protestant and other	11	6.11	5	7.81
Mothers occupation				
Farmer and housewife	28	15.56	9	14.06
Housewife	151	83.89	53	82.81
Merchant	1	0.56	2	3.13
Wealth status				
Poorest	32	17.78	18	28.13
Poor	35	19.44	13	20.31
Middle	37	20.56	12	18.75
Rich	39	21.67	10	15.63
Richest	37	20.56	11	17.19
Partners Educations status.				
No formal education	69	38.3	26	40.63
Primary level	81	45.00	28	43.75
>=Secondary level	30	15.67	10	15.63
Occupation partner				
Farmer	115	63.89	39	60.94
Merchant	32	17.78	12	18.75
Other*	33	18.33	13	20.31

*Daily laborer, employee/unemployed

5.2. Maternal and Pregnancy Related Characteristics of the Respondents

Figure-3 shows maternal and pregnancy related characteristics of the exposed and unexposed respondents. Only 4(3%) of unexposed 1(2%) exposed pregnant mothers had history of low birth weight. Regarding gravidity, about 146 (81.1%) unexposed pregnant mothers were multigravidan and 47(73.4%) of exposed pregnant women were multigravidan. Less than half 62 (34.4) unexposed and 29(45.31) wanted current pregnancy.

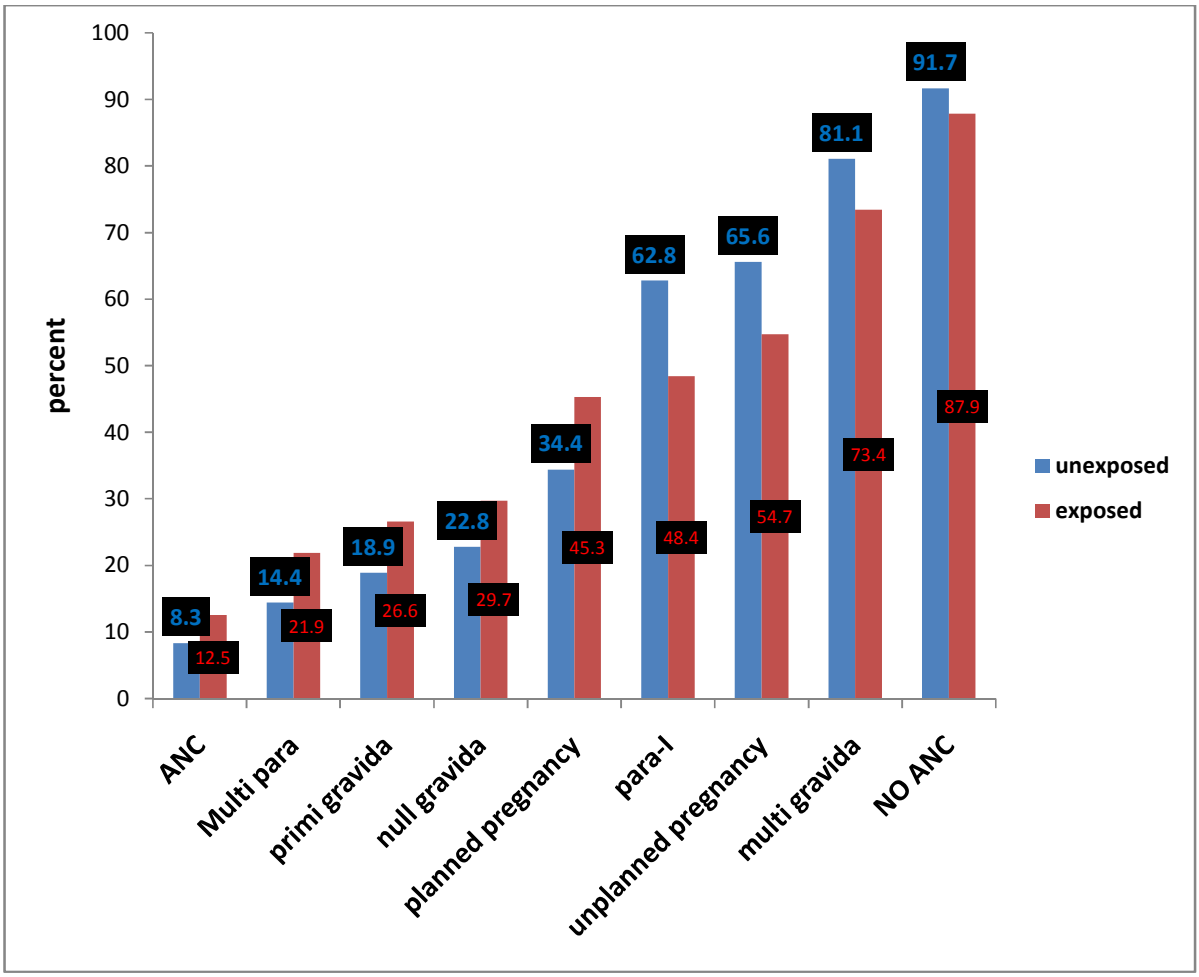

Figure 3: Maternal and pregnancy related characteristics of the sampled pregnant women who lived at BRHP, Gurage Zone, SNNPR, Ethiopia, 2019.

5.3. Maternal Exposure to Caffeine Consumption

Table 2: Summary of descriptive statistic among pregnant mothers by exposure status BRHP, Gurage Zone, SNNPR, Ethiopia 2019

statistics	Unexposed(in mg/day)	Exposed(in mg/day)
Median	79	307
IQR	86	102
Minimum	0	201
Maximum	199	478

As shown in figure four, Ninety three percent, 223(92.6%) were exposed to caffeine. Pertaining the sources of their caffeine consumption, 165 (67.6%) used to drink black coffee, about 41(21.5%) consumed coffee with milk and around 20(10.5%) of the pregnant women consumed black tea (Figure 4). None of the pregnant mothers was drinking Pepsi, coca -cola, coffee with tea and tea with lemon.

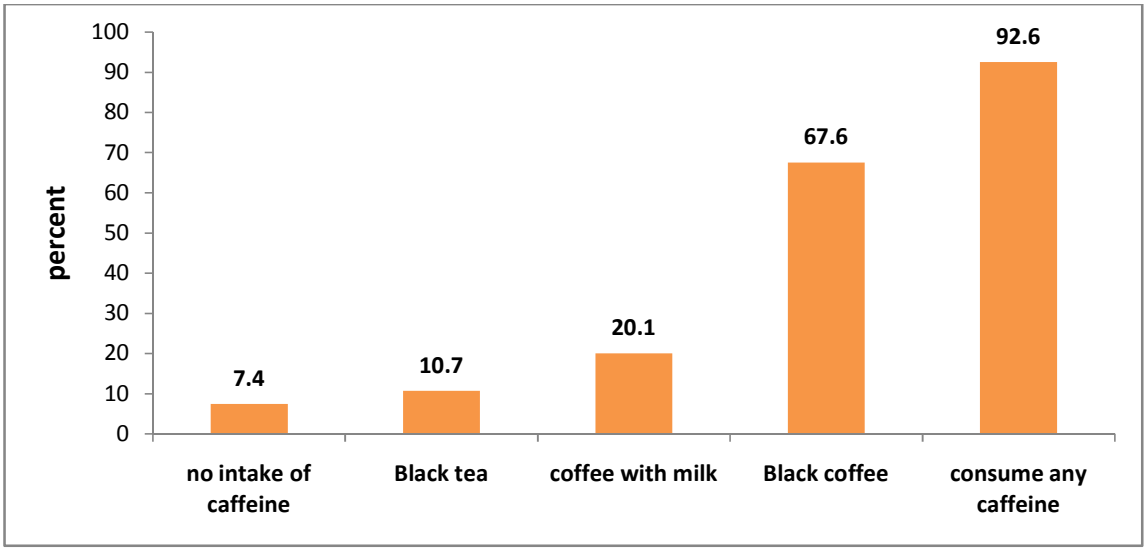

Figure 4: Source of caffeine consumption in percentage among pregnant mothers in BHRP, Gurage Zone, SNNPR, Ethiopia, 2019

5.4. Birth Weight of the Neonate

Figure 5: shows percentage of low birth weight. Of total delivered neonates about 31(12.7%) of them were low birth weight 25(10.2%) was small for gestational age (Figure 5).

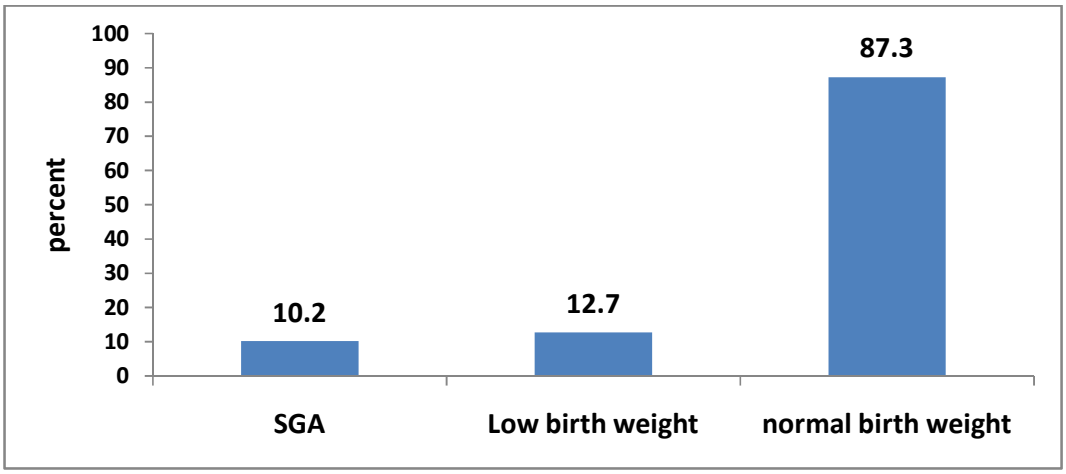

Figure 5: The incidence of low birth weight of neonate delivered at BRHP, Gurage Zone, SNNPR, Ethiopia, 2019.

From the total 244 pregnant mothers involved in this study, about 64(26.2%) pregnant consumed caffeine (>=200mg/day) and 33(13.5%) consumed caffeine (>=300mg/day) by using single 24-recall method and 64(20.11%) and 33(3.75%) respectively for caffeine consumer (>=200mg/day) and (>=300mg/day) by NCI method using SAS. The difference might be single 24 recall method overestimate daily caffeine consumption. Regarding hypertension, only 6(2.46%) of unexposed were hypertensive (Table2). Concerned about nutritional status of the mothers, based on mid upper arm circumference (MUAC) about 5(2.78%) of unexposed and 3(4.69%) of exposed pregnant mothers had chronic energy malnutrition

Table 3: Frequency distribution of risk factors of low birth weight among pregnant mothers in BRHP, Gurage Zone, SNNPR, Ethiopia, 2019

Variables	Unexposed mothers(<200mg/day)		Exposed mothers (≥200mg/day)	
	Number	Percent (%)	number	Percent (%)
Caffeine	180	73.77	64	26.23
Hypertensive	6	2.46	0	0
Maternal height(<150cm)	21	11.67	12	5.00
Anemia	1	1.67	2	3.13
Nutritional status(MUAC<22cm)	5	2.78	3	4.69

5.5. Chi-square (cross tab result of associated factors of low birth weight)

From the total pregnant women who consume excessive caffeine, sixty four about 17(7.0%) were delivered low birth weight neonate .This was shown (Table4).

Table 4: The cross tabulation of caffeine consumption with low birth weight among pregnant mothers in BRHP, Gurage Zone, SNNPR, Ethiopia 2019

Caffeine consumption	Birth weight			P-value
	Normal (%)	LBW (%)	Total (%)	
<200mg/day	166(68.)	14(5.7)	180(73.8)	
>=200mg/day	47 (19.3)	17(7.0)	64(26.2)	< 0.01
Total	213(87.3)	31(12.7)	244(100)	

5.6. Factors Associated With Low Birth Weight

5.6.1. Bivariate and multivariable log binomial regression

After bivariate and multivariable log binomial regression was run independently, caffeine consumption, maternal height and wealth index were declared variables as risk factors for low birth weight.

Table 4: Show the multivariable log binomial regression analysis fitted to identify associated factors for low birth weight.

After adjustment for possible confounder such as maternal height, sex of neonate, educational status of partner, wealth status, ANC, and chat chewing during pregnancy we found that pregnant mothers exposed to caffeine consumption, height of the mothers and wealth index were significantly associated with low birth weight. The risk of low birth weight was three times more likely to occur in exposed group than in unexposed group (ARR=3.72; 95%CI: 1.76, 7.87)

Table 5: Shows the multivariable log binomial regression analysis fitted to identify associated factor for low birth weight among sampled pregnant women who lived at BRHP, Gurage Zone, SNNPR, Ethiopia, 2019.

Variable	BW Count (n, %)						
Caffeine(mg/day)	**Normal**	**LBW**	**CRR**	**95%CI**	**ARR**	**[95%CI]**	**Sig**
<200	166(68.03)	14(5.7)	1	.	1	.	.
>=200	47(19.3)	17(7.0)	3.42	(1.79,6.52)**	3.72	(1.76,7.87)	***
Maternal height(cm)							
>=150	190(77.9)	21(8.60)	1	.	1	.	.
<150	23(9.43)	10(4.1)	3.04	(1.58,5.88)**	2.45	(1.11,5.41)	***
ANC4							
Yes	22(9.02)	1(0.4)	1	.	1	.	.
NO	191(78.3)	30(12.30)	3.12	(.44, 21.84)	3.07	(0.40,23.62)	
Wealth status							
poorest	46(18.85)	4(1.64)	1	.	1	.	.
Poor	44(18.03)	4(1.640)	1.04	(.28,3.93)	3.19	(.63,16.17)	
Middle	42(17.21)	7(2.87)	1.79	(.56 , 5.72)	4.61	(1.08,19.69)	**
Rich	41(16.80)	8(3.28)	2.04	(0.66, 6.34)	5.39	(1.23,23.58)	**
richest	40(16.39)	8(3.28)	2.08	(.67 , 6.47)	4.54	(1.07,19.25)	**
Partner Education							
No formal	81(33.2)	14(5.74)	.84	(.37,1.93)	.39	(.13, 1.23)	*
Primary	99(40.57)	10(4.09)	.52	(.21, 1.28)	.27	(.09, 1.85)	*
>=secondary	33(13.52)	7(2.87)	1	.	1	.	.
Sex of neonate							
female	99(40.57)	18(7.34)	1.50	(.77,2.93)	1.55	(.73,3.28)	
Male	114(46.7)	13(5.34)	1	.	1	.	.
Chat chewing							
YES	205(85.4)	31(12.7)	1.32	(.55,3.19)	1.27	(.46,3.51)	
NO	8(3.3)	0(0)	1	.	1	.	.

*** *p<0.01,* ** *p<0.05,* * *p<0.1* **CI**: Confidence Interval, **CRR**: crude risk ratio, **ARR**: Adjusted Risk Ratio Adjusted for caffeine, maternal height, sex of neonate, educational status of partner, wealth status, ANC, and chat chewing during pregnancy

6. DISCUSSION

A prospective nested cohort study was conducted to determine the effect of caffeine consumption during pregnancy on low birth weight. One-day nonconsecutive 24-hour recall was done to collect data related with caffeine for all pregnant mothers. In addition to this, 24-hour recall method was repeated for 21% pregnant mothers. The study found that 26.2% of pregnant women had a daily caffeine consumption more than or equal to 200 mg/day. The median caffeine consumption in unexposed was 79mg (IQR=86) per day with minimum zero and maximum of ninety nine. In addition to this, the median caffeine intake in exposed group was 307 mg (IQR=102) per day with minimum of two hundred one and maximum 478 mg/day.

After adjustment for possible confounder, caffeine consumption, height and wealth status were significant associated factors for low birth weight.

The risk of low birth weight was four times more likely to occur in exposed than unexposed group (<200 mg a day).

The postulated mechanism by which caffeine consumption result in low birth weight were, caffeine absorbed immediately (after 45minutes) from gastrointestinal and passes placenta across freely (9). Additionally, fetuses don't metabolize it well (10) and caffeine has been increasing catecholamine (11) which may causes utero-placental vasoconstriction and then fetal hypoxia, which possibly cause fetal growth and increases cellular cyclic adenosine mono-phosphate which may affect cell development and result in low birth weight (12).

Based on Bradford hill criteria there were effect of caffeine consumption on low birth weight. It fulfills some of the criteria, causality like dose response relationship. The risk of low birth weight was three times more likely to occur in pregnant mothers who consumed caffeine 151-300mg/day than (0-150mg/day) (ARR=3.10; 95%CI: 1.12, 8.57). In similar manner, The risk of low birth weight was ten times more likely to occur in pregnant mothers who consumed caffeine greater or equal to 300mg/day than (0-150mg/day) (ARR=9.52,95%CI:- 3.68-24.58). From this dose response relationship, we can conclude that as the dose of caffeine consumption increase the probability to have low birth weight neonate also increase.

Concerning with temporality, the cause is caffeine, outcome is low birth weight. There were many studies with different study design and setting which had consistent finding. There was strong association between caffeine and low birth weight. The biological plausibility of

caffeine effect on low birth weight was caffeine passes placenta and form vasoconstriction which limit nutrient passing from mother to fetus, then resulted in low birth weight. This study was not fulfilling the criteria of specificity, because there were other factors which result in low birth weight. Caffeine was not the sole risk factor to low birth weight.

Based on literatures, high levels of caffeine intake during pregnancy can result in miscarriage, low birth weight, growth restriction, stillbirth, and increases the risk of health problems in later life(85-90). According to a reports from literatures, a higher maternal caffeine intake (more than 50 mg per day) during pregnancy was associated with a higher risk of delivering low birth weight infants compared to no intake or very low intake (88, 90). This risk appears to increase linearly as caffeine intake increases (91, 92).

Other consistent reports from observational studies, the risk of having low birth weight was high for high caffeine consumption compared to moderate and low consumption. It has been established that each 100-mg/day increase in maternal caffeine intake (about one cup of coffee) was associated with 13%greater risk of having low birth weight (73).

Study done in united states shows, When comparison was made with women who had no caffeine exposure, the relative risks of low birth weight after adjustment for confounding factors were 2.3 (95% CI 1.1-5.2) for 151- 300 mg/day. Excessive daily caffeine intake(>=200 mg/day) has been associated with an increased risk of birth to SGA or LBW (<2500 g) babies (25).

On the other hand, the recommendation of Marches of Dimes, American college of obstetrics and gynecology, American pregnancy association, Food and drug administration ,cable news network's and American food safety which proposed greater than 200mg/day caffeine result in low birth weight so that caffeine should be limited to less than 200mg/day.

However, systematic review was done by WHO on effect of caffeine consumption on pregnancy outcome specifically on low birth weight. Based on this review, it developed context-specific recommendation guideline and generate three categories of certainty evidence level. These were very low, low and moderate certainty evidence level. Based on this certainty evidence level, very low certainty evidence level shows that less than 150mg per day of caffeine consumption during pregnancy may be associated with fewer low birth weights (5 none randomized studies). In similar manner low certainty evidence level indicated between 150-300mg/day caffeine consumption probably associated with low birth

weight (7 none randomized studies). On the other hand, moderate certainty evidence level revealed caffeine consumption greater than 300mg/day associated with low birth weight. The developed guideline revealed that greater than or equal to 300mg/day of caffeine consumption during pregnancy associated with low birth weight with moderate certainty evidence level. According to WHO recommendation, only moderate certainty evidence level is considered until high certainty evidence level will be updated. In accordance with this guideline development standards, this recommendation will be reviewed and updated following the identification of new evidence, with major reviews and updates at least every five years.

Furthermore, different studies which were done at different western country didn't find out any associations between caffeine consumption and low birth weight for daily caffeine consumption greater than 200mg/day, this may be due to studies measured birth weight at four week after delivery, this may be increase birth weight (77). In addition to this study used food frequency questionnaire for caffeine consumption, this might be lead to recall bias.

Additionally, the risk of low birth weight was two times more likely to occur in short stature pregnant mothers than normal height. Maternal height might be associated with LBW even though it is not completely understood how. This may be contributed by both genetic and environmental factors. Short-statured women are more likely to pass on to their fetus a genetic predisposition for smaller growth (54). Anatomical factors may also play a role in the risk, as short stature can be associated with a smaller uterus, and can therefore impose physical limitations (55) on the uterine, placenta and fetuses growth. Furthermore, height is correlated to pelvic size, and therefore, a short-statured woman may have a smaller pelvis, which may result in its earlier filling(54). Maternal short stature may also be associated with a lack of nutrients, resulting in decreased fetal growth or duration of gestation, (55).

Concerning about wealth status, the risk of developing low birth weight were four, five and five times more likely to occur in middle, rich and richest pregnant mothers than poorest wealth status respectively. As woman wealth status increases, the chance of buying coffee and consuming caffeinated beverages might increase. In other hand, developing countries, women of low socioeconomic status are likely to be shorter and thinner and to consume fewer calories and other nutrients during pregnancy and result in prematurity or IUGR and low birth weight(52).

Regarding the overall implication of this study, excessive caffeine (≥200mg per day) consumption result in low birth weight. Caffeine in coffee alone would account for 4% of cases of low birth weight (72). In Ethiopia neonatal death associated by low birth weight was high (3.63%) of all death (18). Therefore, greater than two hundred milligram per day caffeine consumption could be addressed in order to prevent neonatal death associated with low birth weight.

7. STRENGTHS AND LIMITATIONS OF THE STUDY

7.1. Strengths

As strengths, since it was community based prospective cohort study, the finding of the study could detect cause-effect relationship for effect of caffeine consumption on low birth weight and also generalize able to all pregnant women living in the study area. All days of the week were considered in order to control days of the week effect. In addition, around twenty (21%) percent was repeated 24-hour recall which is the recommended methods for the assessment of exposure with in risk assessment processes was done to control within person variation of caffeine intake. Regarding data collection tools this study was used different methods like structured questionnaires, anthropometry measurement, and biochemical measurement. Fourthly, first trimester ultrasound was used to estimate gestational age which was appropriate than second and third trimester ultrasound.

7.2. Limitations

The study findings should be interpreted and utilized by considering the following limitations. First, the level of caffeine concentration was obtained from previously done researches. However, the concentration of caffeine may vary based on the roasting and brewing process. Due to these reasons it might not give a perfect estimation of daily caffeine intake. Second, substances use such as alcohol and tobacco use are considered as taboo in the study area. As a result, the respondent might not report their consumption and this might introduce social desirability bias and this might not be enables researcher to control confounder's effect of alcohol and tobacco on low birth weight. Third, physical activity and dietary Assessment of the pregnant women was not controlled for confounder.

8. CONCLUSIONS AND RECOMMENDATIONS

8.1. Conclusion

Data obtained from 24-hour recall method for assessment of caffeine consumption during pregnancy, interview of general information, interview of birth weight, Measurement of maternal anthropometry and biochemical measurement was used. The finding of this study shows, excessive maternal caffeine consumption result in low birth weight.

8.2. Recommendations

Based on the study findings; the following recommendations were drawn:

Federal Ministry of health (FMOH) should give emphasis on substance use during pregnancy and align with this and should develop Guideline and manuals for social and behavioral change communication for community to prevent excessive caffeine consumption during pregnancy.

Health professionals should screen and counsel all pregnant women for substances use during ANC visit. Additionally, they should provide health education about the risk of substances use on the fetus.

Programmers working at maternal and child health shall plan an intervention program which aimed to increase the awareness of community and pregnant women about the harmful effects of excessive caffeine consumption during pregnancy with the ultimate goal of preventing adverse pregnancy outcomes related to excessive caffeine intake during pregnancy.

Interested researchers shall determine the level of caffeine concentration from each caffeinated beverage for the accurate estimation of daily caffeine intake among pregnant woman.

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Annexes

Annex I. English version of data collection tools

(Interview, questionnaire, Ultrasound, anthropometric and biochemical measurement result)

Part 1.Interview Information, Ultrasound Measurement, Women anthropometric measurement and biochemical result

Number	Question	Response	Variable
101	Date of interview (dd/mm/yyyy)	☐☐/☐☐/☐☐☐☐	HDATEINT
102	Data Time Point (1-3)	☐☐☐☐up to ☐☐☐☐	HDTIMEPT
103	Household ID	☐☐☐☐☐☐☐☐☐☐	HHID
104	Kebele name	*(text)*	HKEBELE
105	Kebele Code (HDSS code)	☐☐☐☐	HKEBELECO
106	Gote	*(text)*	HGOTE
107	Interviewer's ID	☐☐	HID1
108	Supervisor's ID	☐☐	HSID
109	Outcome of this Interview	1. Completed 2. Incomplete 3. Refused	HINTOUT

Ultrasound Measurement result

	Question		Second Visit	Third Visit
110	Date of enrollment			
111	Gestational age		Weeks	
112	Estimated date of delivery by			
113	Type of pregnancy		Single--------1 Twin----------2	
114	Any other important finding relevant for the health of the mother or the fetus (e.g heart			

Women Anthropometry

	Question		Second Visit	Third Visit
115	Weight		☐☐☐Kg	☐☐☐Kg
116	mid upper arm circumference		☐☐☐cm	☐☐☐cm
117	Height		☐☐☐cm	☐☐☐cm
118	Blood pressure (systolic)		☐☐☐mmHg	☐☐☐
	Blood pressure (diastolic)		☐☐☐mmHg	☐☐☐ mmHg

Biochemical result				
119	**Hemoue result (g/dl)**		---------- BLHEAMCGRE	---------- BLHEAMCG

Part II: <u>General information, Household and Socioeconomic Characteristics</u>

I would like to ask you a few questions about you and your partner

Number	Question	Responses	Variable name
201	In what month and year were you born?	Month…… Don't know month ..... 9999 Year..... Don't know year..... 99	WMONTH WYEAR
202	How old are you now? COMPARE AND CORRECT AND /OR IF INCONSISTENT	_____years	WAGE
203	What is the highest level of school you attended?	Primary (1-8) ..... 1 Secondary(9-12)..... 2 College/university ..... 3 Read and write ..... 4 Can't read and write 5	HEDUTION
204	What is your religion?	Orthodox Christian..... 1 Islam ..... 2 Protestant ..... 3 Catholic ..... 4 Other (specify) ..... 99 _____	WRELIGION
205	To which ethnic group do you belong?	Oromo..... 1 Amhrara ..... 2 Gurage ..... 3 Tigray ..... 4 Afra ..... 5 Silete..... 6 Other (specify) ..... 99 _____	WETHNIC
206	What is your occupation?	Farmer and housewife..... 1 Housewife ..... 2 employee/private ..... 3 Student..... 4 Merchant..... 5	WOCCUPATI

		Local drink seller ..... 6 Commercial sex worker ..... 7 Maid servant ..... 8 Daily laborer ..... 9 Unemployed ..... 10 Farmer and merchant ..... 11 Other (specify) ..... 99 _____	
207	What is your marital status?	Currently married ..... 1 Separated ..... 2 Divorced ..... 3 Widowed ..... 4 Never married 99	WMARITAL If 2,3,4,99 Go to 211
208	How old is your partner?	_____years	PAAGE
209	What is your partner/husband educational status? (highest level of school attended)	Primary (1-8) ..... 1 Secondary(9-12)..... 2 College/university ..... 3 Read and write ..... 4 Can't read and write 5	PAEDCUATI
210	What is your partner/husband occupation?	Farmer ..... 1 employee/private ..... 2 Student..... 3 Merchant..... 4 Daily laborer ..... 5 Unemployed ..... 6 Other (specify) ----------99 _____	PAOCCUPAT

I am going to ask you questions about your household and related conditions.

Number	**Question**	**Responses**	**Variable name**
211	Main construction material used for the floor:	Natural floor Earth /sand .....11 dung .....12 Rudimentary floor	**HFLOOR**

	CIRCLE ALL THAT APPLY	Wood planks .....21 Bamboo.....22 <u>Finished floor</u> Polished wood or parquet.....31 Ceramic tiles .....32 Cement .....33 Carpet.....34 Other (specify) .....99 _____	
212	Main construction material used for the roof: CIRCLE ALL THAT APPLY	<u>Natural roofing</u> Thatch/leaf/mud .....11 <u>Rudimentary roofing</u> Plastic.....21 Bamboo.....22 Wood planks .....23 <u>Finished roofing</u> Corrugated iron/metal.....31 Wood .....32 Cement/concrete .....33 Other (specify).....99 _____	**HROOF**
213	Main construction material used for exterior walls: CIRCLE ALL THAT APPLY	<u>Natural walls</u> No walls .....11 Cane/Trunks/Bamboo/Reed .....12 Dirt .....13 <u>Rudimentary walls</u> Wood with Mud .....21 Stone with mud .....22 Card board .....23 <u>Finished walls</u> Stone with lime/cement .....31 Bricks .....32 Wood planks/shingles .....33 Other (specify) .....99 _____	
214	What kind of toilet facility does your household have? [INTERVIEWER: LIMIT TO ONE RESPONSE; IF TWO	<u>Flush toilet</u> Flush to septic tank.....11 Flush to Pit latrine .....12 Flush to somewhere else.....13 <u>Pit latrine</u>	HTOILET

	TYPES ARE MENTIONED, RECORD THE TYPE CLOSEST TO THE TOP OF THE LIST]	Traditional pit toilet .....21 Pit latrine with slab .....22 Pit latrine without slab .....23 Ventilated improved pit latrine ....24 Composting toilet .....25 No facility/bush/field .....31 Other (specify) .....99 _____	
215	What is the main source of drinking water for members of your household? [INTERVIEWER: BE SURE OF THE SOURCE OF "PIPED WATER". IF THE ANSWER IS "PIPED WATER" CHECK THE SOURCE AND CIRCLE THE APPROPRIATE CODE]	<u>Piped water/supply water</u> Piped inside dwelling .....11 Piped to yard/plot .....12 Public tap .....13 <u>Water from spring</u> Protected well/spring .....21 Unprotected well/spring.....22 <u>Water from Dug well</u> Protected well .....31 Unprotected well .....32 <u>Surface water</u> Pond/lake/River/stream/spring/Dam .....51 <u>Rain water</u> .....61 <u>Tanker truck</u> .....71 <u>Vendor</u> .....81 <u>Bottled water</u> .....91 No fixed facility .....96 Other (specify) .....99 _____	HWATER

216	Tell me, please, if your home has: [INTERVIEWER: CIRCLE ALL THAT APPLY]	Electricity.....1 Watch/clock .....2 Radio.....3 Television.....4 Mobile Telephone.....5 House Phone .....6 Refrigerator .....7 Chair .....8 A bed with cotton/Sponge/Spring mattress.....9 Electric Mitad.....10 Kerosene Lamp/pressure .....11 Solar .....12 Flash light that works with battery..13	HELECTRIC HWATCH HRADIO HTELEVSIO N HMOBILE HPHONE HFRIGE HCHAIR HBED HMITAD HLAMP
217	What type of fuel does your household mainly use for cooking? [INTERVIEWER: ALLOW MULTIPLE ANSWERS]	Electricity.....1 LPG/natural gas.....2 Biogas .....3 Kerosene .....4 wood .....5 Charcoal.....6 Straw/shrubs/grass.....7 Animal Dung.....8 Agricultural crop .....9 Other (specify) .....10 _____	HFUELELEC T HFUELGAS HFUELBIO HFUELKERO HFUELWOO HFUELCHA R HFUELGRAS HFUELDUN HFUELCROP HFUELOTHE
218	Do you have a separate room which is used as a kitchen?	No .....1 Yes.....2	HKITHCEN
219	Does any member of the house hold own the following? [INTERVIEWER: CIRCLE ALL THAT APPLY]	Bicycle .....1 Motorcycle/scooter/Bajaj.....2 Animal drawn cart.....3 Car/Truck.....4	HBICYCLE HMOTOR HCART HCAR

220	How many (LOCAL UNITS) of agricultural land do members of this household own? LOCAL UNITS _____ (SPECIFY)	Local units |__|__| Don't have.....00	HLANDSIZE
221	How many of the following animals do you keep? (INTERVIEWER: IF HOUSEHOLD DOES NOT OWN A PARTICULAR ITEM, RECORD "00" AGAINST THAT ITEM.)	a) Milk cows, oxen or bulls... |__|__| b) Chickens ..... |__|__| c) Goats..... |__|__| d) Sheep ..... |__|__| e) Horses ,donkey, or mule ... |__|__| f) Beehives ..... |__|__|	HCOWS HCHICEKEN HGOATS HSHEEP HHORISE HBEEHIVES
222	Does any member of the hold have a bank or microfinance saving account	No .....0 Yes.....1	HSAVING

How do you dispose of household rubbish? (Do not read the responses. Allow respondent to answer, then fill each item below.)

223	Garbage pit	☐ 1=Yes ☐ 0=No	HPIT
224	Discard in garden	☐ 1=Yes ☐ 0=No	HGARDEN
225	Discard in bush	☐ 1=Yes ☐ 0=No	HBUSH
226	Open burning	☐ 1=Yes ☐ 0=No	HBURN
227	Other (specify_____)	☐ 1=Yes ☐ 0=No	HOTHER

Under what circumstances do you wash your hands? (Do not read the responses below. Allow respondent to answer, and then fill each item below.)

228	Not at all	☐ 1=Yes ☐ 0=No	HNIL
229	When dirt is visible	☐ 1=Yes ☐ 0=No	HDIRT
230	After toilet use/defecation/urination	☐ 1=Yes ☐ 0=No	HTOILETUSE
231	After cleaning child following defecation	☐ 1=Yes ☐ 0=No	HCLEANCHI
232	Before preparing the food	☐ 1=Yes ☐ 0=No	HFOOD
233	Before serving a meal	☐ 1=Yes ☐ 0=No	HMEAL
234	Before eating	☐ 1=Yes ☐ 0=No	HEAT
235	Before feeding a child	☐ 1=Yes ☐ 0=No	HFEEDBABY
236	When I am reminded to do so	☐ 1=Yes ☐ 0=No	HREMIND

Part III: Past obstetric history

I am going to ask you about your previous pregnancies and health. Please respond to the following questions about you yourself. (Skip if it is first pregnancy)

	Question	**Responses**	**Skip**
301	Now I would like to ask about all the pregnancies you have had during your life. During your life how many times have you been pregnant? (including those that did not end with a live births), record "00" if none	[_____] times If "00" go to 409	
302	Now I would like to ask about all the births you have had during your life. During your life how many times have you given live birth? ***[I mean, to a child who ever breathed or cried or showed other signs of life – even if he or she lived only a few minutes or hours], record "00" if none)***	[_____] times Don't Know……....99	
303	Have you ever had a fetus died in utero before birth?	Yes ……1 No …….. 2 →Go to 305 Don't Know……....99 →Go to 305	
304	During your life how many times have you had fetus died in utero?	[_____] times Don't Know……....99	
305	Have you ever given birth to a preterm child (between 28 – 37 weeks of gestation)	Yes ……...1 No …….. 2 →Go to 307 Don't Know……....99 →Go to 307	
306	During your life how many times have you given birth to a preterm child (between 28 – 37 weeks of gestation)	[_____] times Don't Know……....99	
307	Have you ever had abortion/pregnancy terminated before 28 weeks of gestation?	Yes ……1 No ……..2 →Go to 309 Don't Know……..99 →Go to 309	
308	During your life how many times have you had abortion/pregnancy terminated before 28 weeks of gestation?	[_____] times Don't Know……....99	
309	Have you ever used anything or tried in any way to delay or avoid getting pregnant?	Yes ……1 No …….0 → Go to 312 Don't know ……99 → Go to 312	

310	Which method did you use before (MOST RECENT METHOD) you stopped using contraceptives? DO NOT READ THE METHOD CHOICES.	Female sterilization---1 Male sterilization----- 2 IUD---------- 3 Injectables------- 4 Implants-------- 5 Pill---------- 6 Male Condom--- 7 Female condom---- 8 Emergency Contraception……9 Standard Days/Cycle Beads...10 Lactational Amen. Method---11 Other modern method ---------12 Rhythm method--------13 Withdrawal----------14 Other traditional method…….15	
311	How long do you use the contraceptives?	[_____] Month [_____] Year	

Previous postnatal history

No	Questions	Last birth	Next to last birth	Skip
312	When your baby was born, was the baby very large, larger than average, average, Smaller than average, or very small?	Very large . . . . . 1 Larger than average . . . . . 2 Average . . . . . 3 Smaller than average . . . . . 4 Very small . . . . . 5 Don't know 99	Very large . . . . . 1 Larger than average . . . .2 Average . . . . . 3 Smaller than average . . .4 Very small . . . . . 5 Don't know 99	
313	Was your baby weighed at birth?	Yes . . . .1 No . . . . 0 Don't know 99	Yes . . . .1 No . . . .0 Don't know 99	

314	How much did your baby weigh?	KG from card [_____]. [_____][_____]……..1 KG from recall [_____] .[_____][_____]……..2 Don't know ……8	KG from card [_____]. [_____][_____]……..1 KG from recall [_____] .[_____][_____]……..2 Don'tknow……8	

Part IV: <u>Current Pregnancy and maternal medical disorder</u>

s. No.	**Questions**	**Responses**	**Skip**
401	At the time you became pregnant with the index delivery, did you plan to get pregnant, did you want to wait until later, OR did you NOT WANT to have any more children?	Planned …….1 Later…….…….2 Not want more children…….3	
402	For how many weeks have you been pregnant? (prompt with date of last menstrual period)	_____ weeks Don't Know …….. 99	
403	Did you see anyone for antenatal care during this pregnancy?	Yes …… 1 No …… 0 →Go to 421 Don't know …99 →Go to 421	
404	Whom do you see? Anyone else?	**HEALTH PERSONNEL** Doctor ……..1 Nurse…… 2 Midwife …… 3 Health officer …… 4 Health extension worker…5 **Other person** Traditional birth attendant . 6 Other . . . . . 7 _____ (specify)	

405	Where did you receive Antenatal care during this pregnancy? Anywhere else	**HOME** Her home ……... 1 Other home ……. 2 **PUBLIC SECTOR** Government hospital ……..3 Government health center/station…….4 Government health post ……5 Other public sector ……6 _____ (specify)	
406	How many months pregnant were you when you first received antenatal care for this pregnancy?	Months . . . . . . [_____][_____] Months Don't know 99	
407	How many times did you receive antenatal care during this pregnancy?	Number of times [_____] Don't know 99	
407.A	When did you receive your antenatal care visit(s)	Date for each ANC visit Visit 1 DATE (DD/MM/YYYY) [____/____/_____] Visit 2 DATE (DD/MM/YYYY)	
407.B	During (any of) your Antenatal care visit(s) were you told about the signs of pregnancy complications or danger sign of pregnancy?	Yes . . . . . 1 No . . . . . 0 →Go to 407D Don't know . . . . .99 →Go to 407D	
407.C	Which signs of pregnancy complications were you told about? (more than one answer is possible)	Vaginal bleeding. . . . . 1 Vaginal gush of fluid . . . . . 2 Severe headache. . . . . 3 Blurred vision. . . . . 4 Fever . . . . . 5 Abdominal pain. . . . . 6 Convulsion . . . . . 7 Other . . . . . 8 _____ (specify)	
407.D	During any of your antenatal visit were you told about birth preparedness plan?	Yes . . . . . 1 No . . . . . 0 Don't know	

407.E	Which plans were you told about? (more than one answer is possible)	Place of birth……1 Supplies needed for birth--2 Emergency transportation- 3 Money/emergency fund ---4 People to support during/after birth …….5 Potential blood donors……..6	
408	As part of your antenatal care during this pregnancy, were any of the following done at least once: a) Was your blood pressure measured? b) Did you give a Urine sample? c) Did you give a Blood sample? d) Did any health worker give you information about what to eat?	YES NO a) BP . . . . . .1 2 b) URINE . . . . . ……....1 2 c) BLOOD . . . . . ……....1 2	
409	During this pregnancy, were you given an injection in the arm or shoulder to prevent the baby from getting tetanus, that is, convulsions after birth?	Yes . . . .1 No . . . . . ….0 →Go to 410 Don't know 99	
409A	Did you ever receive a TT vaccination card?	Yes, TT card seen……...1 Yes, TT card not seen ……2	
410	During this pregnancy, how many times did you get a tetanus injection?	[_____] TIMES	
411	During this pregnancy, were you given or did you buy any iron tablets?	Yes . . . . 1 No . . . . 0 →Go to 418 Don't know . . . 99 →Go to 458	
412	During the whole pregnancy, for how many days did you take the tablets?	[_____][_____] Days	
413	If yes, will you continue taking the tablets through this pregnancy?	Yes . . . . 1 No . . . . 0 Don't know. 99	
414	Where did you get iron tablets?	HEW at Hom------1 Health Post--------.2 health center------.3 Hospital ----------.4 Drug shop/pharmacy ----.5 Other shops----------.6 Other (Specify-------.99	

415	Why (for what benefits) did you take the iron tablets?	To prevent anaemi…1 Make you stronger…2 No need to take…3 Don't know ------99	
416	Did you experience any side effects?	Yes----------.1 No----------.0 Don't Remember----99	
417	What were the side effects you experienced?	Constipation -----1 Stomach pains---.2 Nausea----------3 Dark Stool-------4	
418	During this pregnancy, did you take any drug for intestinal worms?	Yes . . . . 1 No . . . . 0 Don't know 99	
419	During this pregnancy, did you have your weight measured?	Yes . . . . 1 No . . . . 0 Don't know 99	
420	During this pregnancy, did you have your height measured?	Yes . . . . 1 No . . . . 0 Don't know	
421	During this pregnancy, did you have your abdomen examined?	Yes . . . . 1 No . . . .0 Don't know	
422	During this pregnancy, did you have a Sonogram or ultrasound?	Yes . . . . . 1 No . . . . 0 Don't know .. . . …. 99	
423	During this pregnancy, were you given information about what to eat?	Yes----------.1 N0----------.0 Don't Remember-----99	

MATERNAL MEDICAL DISORDERS

424	Are you currently sick of Malaria disease?	Yes . . . . 1 No . . . . 0 Don't know 99	
425	Within the last 3 months were you diagnosed with Malaria?	Yes . . . . 1 No . . . . 0 Don't know 99	
426	Other known disease?	Yes . . . . 1 No . . . . 0 Don't know 99	

Part V: Part 5 Substance use during pregnancy

Form for Recording the Interactive 24-hour Recall

Section v: Questions Prepared to Assess Caffeine Consumption during Pregnancy Instruction: Now I am going to ask you questions about your consumption of coffee, tea, and soft drinks during the last 24 hours. (Notice: Tell to her the time range carefully. Example, if the interview takes place at 8 am, ask her what she drunk/ate from yesterday 8 am up to today 8 am)

Question	Type of beverages and foods	Have you drank /ate____ (name) in the last 24- hours? Yes……1 No…….2 (write only the code as 1 or 2)	Where you drank it? At home.....1 Outside .....2 Machine prepared.... 3 (write only the code as 1,2 or 3)	During the last 24 hours, how many times did you prepare _____ (Name)? (write the number)	Which serving size you used? (show the picture and circle the corresponding code)	How many serving sizes did you have in the last 24 hours from the 1 st, 2nd, 3rd, 4th.etc? Round? (Add all serving sizes from each round and write the number under the corresponding round)					
						1st	2nd	3rd	4th	5th	6th
	Coffee										
501	Black coffee				code1						
					code2						
					code3						
502	Coffee with milk				Code1						
					Code2						
					Code3						
503	Coffee with tea				Code1						
					Code2						
	Tea										
504	Black tea				Code1						
					Code2						
					Code3						
					Code4						
505	Tea with lemon				Code1						
					Code2						
					Code3						
					Code4						
	Soft drinks										
506	Coca-cola				Code1						
					Code2						
					Code3						
					Code4						
507	Pepsi				Code1						

					Code2						
					Code3						
					Code4						

Food frequency questionnaire (toxic exposure)

508	Do you drink *tella* or *Areke* (local drinks) or *Beer in this pregnancy?* (please specify the type of drink here ([_____])	Yes ……....1 No……....0→Go to **521** Don't Remember…….....99 →Go to **521**	
509	Do you drink [mention drink] every day during this pregnancy?	Yes……....1 No……....0 Don't Remember…….....99	
510	If yes, how many [units/bottle] per day?	[_____] units/bottle per day	
511	If yes, how many [units/ bottle] per week/month?	[_____] units/bottle per week [_____] units/bottle per Month Don't Know……....99	
512	Do you chew chat during this pregnancy?	Yes ……....1 No……....0 →Go to **525** Don't Remember…….....99 →Go to **525**	
513	Do you chew chat every day during this pregnancy?	Yes ……....1 No……....0 Don't Remember…….....99	
514	If yes, how much [local unit] per day?	[_____] [local unit] per day	
515	If no, how much [local unit] per Week?	[_____] [local unit] per week	
516	Have ever smoked cigarettes?	Yes……1 No…… 0 →Go to **601** Don't Remember…… 99 →Go to **601**	
517	Do you currently smoke cigarettes?	Yes. ……1 No …… 0 Don't Remember…99	
518	In the last 24 hours, how many cigarettes did you smoke?	[___|___] CIGARETTES	

519	Is there any family member who smokes cigarettes?	Yes ……1 No …… 0 Don't know……99	

Part VI: Interview information for neonate and Neonate Anthropometry

(This information will be taken after delivery)

Postnatal visit (1-3days) **questionnaire Id Number**_____			
601	Date of interview	_____ DD/MM/YY	
602	Place of study	Kebele_____ Gote _____	
603	Name of interviewer	Name_____ Signiture _____	
604	Date of birth	_____/_____/_____ DD/MM/YY	
605	Time of delivery	Hour _____ minute_____	
606	Sex of neonate	Male _____1 Female_____2	
607	Was the delivery twins?	Yes……1 No ……2	If No skip to Q. 610
608	If Yes how many neonate did you deliver?	_____	
609	How many of them were born alive?	_____	
610	During interview what is the condition of the neonate?	Alive (at home)……..1 Alive (at Hospital) …….2 Not alive…….3	
611	Date of death if the neonate is died?	……../……../……. DD/MM/YY	
612	Weight of neonate?	_____gram	
Interviewer : Ask the mother who face to Abortion or still birth only			
604	Date of Abortion or still birth	_____/_____/_____ DD/MM/YY	

Annex2: .Amharic version of questionnaire

ክፍል 1 አጠቃላይ መረጃ መጠይቅ

ቁጥር	ጥያቄ	መልስ	የመለያ ስም
101	የመጠይቅ ቀን (ቀን/ወር/ዓ.ም)	☐☐/☐☐/☐☐☐☐	HDATEINT
102	የመጠይቅ ሰአት	☐☐☐☐ እስከ ☐☐☐☐	HDTIMEPT
103	የቤት መለያ	☐☐☐☐☐☐☐☐☐☐	HHID
104	የቀበሌ ስም		HKEBELE
105	የቀበሌ መለያ (HDSS ኮድ)	☐☐☐☐	HKEBELECODE
106	ጎጥ		HGOTE
107	የቃለ መጠይቅ አቅራቢው መለያ	☐☐	HID1
108	የሱፐርቫይዘር መለያ	☐☐	HSID
109	የቃለ መጠይቁ ውጤት	4. የተሟላ 5. ያልተሟላ 6. ፈቃደኛ ያልሆኑ	HINTOUT

አልትራሳውንድ መለኪያ ዉጤት

ቁጥር	ጥያቄ	ሁለተኛ ጉበኝት	ሶስተኛ ጉበኝት
110	የምልመላ ቀን		
111	የእርግዝና እድሜ	……. ሳምንት	……. ሳምንት
112	በአልትጋሳዉንድ የተገመተ የወልድ ግዜ		
113	የእርግዝና ሁኔታ	አንድ …….. መንታ……..	
114	ከእናት ወይም ከልጁ ጋር ተያያዥነት ያለዉ ጠቃሚ ዉጤት ካለ ((e.g heart beat,placenta previa, placenta abruption)		
የእናት አንትሮፖሜቲሪ			
ቁጥር	ጥያቄ	ሁለተኛ ጉበኝት	ሶስተኛ ጉበኝት
115	ክብዴት	☐☐☐.ክ.ግ	☐☐☐ክ.ግ
116	የላይኛዉ እጅ ጡንቻ መሀል ዙርያ ልከት	☐☐☐ ሴ. ሜ	☐☐☐ ሴ. ሜ
117	ቁመት	☐☐☐ሴ. ሜ	☐☐☐ ሴ. ሜ
118	የደም ግፊት (systolic)	☐☐☐mmHg	☐☐☐mmHg
	የደም ግፊት (diastolic)	☐☐☐mmHg	☐☐☐mmHg
ባዮኬሚካል ዉጤት			
119	የደም መጠን ዉጤት (g/dl)	---------- BLHEAMCGRE	---------- BLHEAMCGRE

ክፍል 2 አጠቃላይየቤት እና የኑሮ ደረጃ መለኪያ

ስለ እርሶ እና ስለ ባለቤቶ የተወሰነ ጥያቄ ልጠይቆት አወዳለሁ

ቁጥር	ጥያቄ	መልስ	የመለያ ስም
201	በምን ወር እና አመተ ምህረት ነበር የተወለዱት?	ወር …… ወሩን አላውቀውም ..... 9999 አመተ ምህረት..... ዓ.ምቱን አላውቀውም..... 99	WMONTH WYEAR
202	እድሜዎት ስንት ነው? **በማነፃፀር የማይጣጣም ከሆነ/ስህተት ካለው ይታረም**	_____አመት	WAGE
203	የተማሩት ከፍተኛ የትምህርት ደረጃ የትኛው ነው?	የመጀመሪያ ደረጃ(1-8).....1 ሁለተኛ ደረጃ (9-12) .....2 ኮሌጅ/ዩኒቨርሲቲ.....3 ማንበብ እና መጻፍ .....4 ያልተማረ 5	HEDUTION
204	ሐይማኖትዎ ምንድን ነው?	አርቶዶክስ .....1 ሙስሊም .....2 ፕሮቴስታንት .....3 ካቶሊክ .....4 ሌላ (የገለጽ----------99 _____	WRELIGION

206	የስራዎ አይነት	አርሶአደር እና የቤት እመቤት.....1 የቤት እመቤት .....2 የግል .....3 ተማሪ .....4 ነጋዴ .....5 የመጠጥ ሻጭ.....6 ሴተኛ አዳሪ .....7 የቤት ሰራተኛ .....8 የቀን ሰራተኛ----------9 ስራ ----------10 ግብርናእናነጋዴ----------11 ሌላ (ይገለጽ)---------- 99 _____	WOCCUPATI
207	የጋብቻ ሁኔታ ?	በአሁኑ ሰአት በትዳር ላይ ያሉ.....1 የተለያዩ .....2 የተፋቱ.....3 ባለቤታቸው የሞተባቸው .....4 በጭራሽ አግብተው የማያውቁ/ያላገቡ ---99	WMARITAL →ጥ 211 →ጥ 211 →ጥ 211 →ጥ 211
208	የባለቤቶ እድሜ ስንት ነው?	_____አመት	PAAGE

209	የባለበትዎ ከፍተኛ የትምህርት ደረጃ የትኛው ነው?	የመጀመሪያ ደረጃ(1-8).....1 ሁለተኛ ደረጃ (9-12) .....2 ኮሌጅ/ዩኒቨርሲቲ.....3 ማንበብ እና መጻፍ .....4 ያልተማረ 5	PAEDCUATI
210	የባለቤትዎ ስራ አይነት ምንድን ነው?	አርሶ አደር.....1 የግል .....2 ተማሪ .....3 ነጋዴ .....4 የቀን ሰራተኛ .....5 ስራ ፈላጊ.....6 ሌላ (ይገለጽ)---------- 99 _____	PAOCCUPAT

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ቁጥር	ጥያቄ	መልስ	የመለያ ስም
211	ለቤቱ የወለል ስራ በዋነኛነት የተጠቀሙት የግንባታ እቃ ምንድን ነው የተሰራበትን ሁሉ ያክብቡ	<u>ባህላዊ ወለል</u> አፈር .....11 የከብት ውዳቂ .....12 <u>ያላለቀ ወለል</u> የእንጨት ድርድር.....21 ቀርከሀ/አገዳ/ጨፈቃ.....22 <u>ዘመናዊ ወለል</u> ዘመናዊ ጣውላ .....31 ሴራሚክ.....32 ሲሚንቶ .....33 ምንጣፍ.....34 ሌላ (ይገለጽ) 99	**HFLOOR**

212	ለቤቱ የጣሪያ ስራ በዋነኛነት የተጠቀሙት የግንባታ እቃ ምንድን ነው የተሰራበትን ሁሉ ያክብቡ	<u>ባህላዊ ጣሪያ</u> ጣሪያ የለውም .....11 የሳር ክዳን /ቅጠል / .....12 <u>ያላለቀ ጣሪያ</u> ፕላስቲክ.....21 ቀርከሀ/አገዳ/ጨፈቃ.....22 የእንጨት ድርድር.....23 <u>ዘመናዊ ጣሪያ</u> ቆርቆሮ ወይም ብረት .....31 እንጨት .....32 ሲሚንቶ/ኮንክሪት.....33 ሌላ (ይገለጽ).....99 _____	**HROOF**
213	ለቤቱ የግርግዳ ስራ በዋነኛነት የተጠቀሙት የግንባታ እቃ ምንድን ነው የተሰራበትን ሁሉ ያክብቡ	<u>ባህላዊ ግርግዳ</u> ግርግዳ የሌለው.....11 አገዳ/ቀርከሀ/ጨፈቃ .....12 ቆሻሻ .....13 <u>ያላለቀ ግርግዳ</u> እንጨት እና ጭቃ .....21 ድንጋይ እና ጭቃ .....22 ካርቶን .....23 <u>ዘመናዊ ግርግዳ</u> ድንጋይ እና ሲሚንቶ.....31 ጡብ .....32 የእንጨት ጣውላ ድርድር.....33 ሌላ (ይገለጽ) .....99 _____	
214	ቤትዎ ምን አይነት መጸዳጃ ቤት አለው **ከአንድ በለይ መልስ ከተሰጠ በዋናነት የሚጠቀሙትን ይመዝግቡ**	<u>ውሀ ያለው ሽንት ቤት</u> ወደ ሴፕቲክ ታንክ የሚያመራ----------11 ወደ ጉርጓድ መጸዳጃ ቤት የሚያ----------12 ወደ ሆነ ቦታ ጋር የሚገናኝ----------13 <u>የጉርጓድ መጸዳጃ ቤት</u> ባህላዊ የጉርጓድ መጸዳጃ ቤት .....21 ባህላዊ የጉርጓድ ሽንት ቤት በሲሚንቶ የተሰራ--22 ባህላዊ የጉርጓድ ሽንት ቤት በሲሚንቶ ያልተሰራ--23 የተሻሻለ የጉርጓድ መጸዳጃ ቤት .....24 ኮምፖስት መጸዳጃ ቤት .....25 መጸዳጃ ቤት የለም/በቁጥቋጦ /በሜዳ 31	HTOILET

		ሌላ (ይገለጽ) 9 9	
215	ለቤተሰቡ የመጠጥ አገልግሎት የሚውል ውሀ ዋና ምንጩ ምንድን ነው **(ለጥያቄ፡ምንጩ የቧንቧ ውሀ ስለመሆኑ ያረጋግጡ መልሱ የቧንቧ ውሀ ከሆነ አረጋግጠው ትክክለኛውን ኮድ ያክብቡ)**	<u>የቧንቧ ውሀ</u> በመኖሪያ ግቢ ውስጥ ያለ .....11 ከመኖሪያ ግቢ ውጪ .....12 የቦኖ ውሀ.....13 <u>የምንጭ ውሀ</u> የተከለለ/የተጠበቀ የምንጭ ውሀ.....21 ያልተከለለ/ያልተጠበቀ የምንጭ ውሀ .....22 <u>የጉርጓድ ውሀ</u> የተከለለ/የተጠበቀ ጉርጓድ .....31 ያልተከለለ/ያልተጠበቀ ጉርጓድ .....32 <u>የምድር ውሀ</u> ኩሬ/ሀይቅ/ወንዝ/ትንሽ ወንዝ/ምንጭ/ግድብ .51 <u>የዝናብ ውሀ</u>.....61 <u>የታንከር ውሀ</u> .....71 <u>የግዢ ውሀ</u> .....81 <u>የታሸገ ውሀ</u>.....91 ቋሚ የሆነ ምንጭ የለም.....96 ሌላ (ይገለጽ) .....99 _____	HWATER
216	ከሚከተሉት ውስጥ በቤት ውስጥ ያለውን ሊነግሩኝ ይችላሉ በቤት ውስጥ ያለውን ሁሉ ያክብቡ	ኤሌክትሪክ .....1 ሰአት .....2 ሬድዮ .....3 ቴሌቭዥን .....4 ተንቀሳቃሽ ስልክ .....5 የቤት ስልክ.....6 ፍሪጅ..... ወንበር .....8 አልጋ የጥጥ/የስፖንጅ/የስፕሪንግ ፍራሽ/ .....9 የኤሌትሪክ ምጣድ .....10 በጋዝ የሚሰራ ፋኖስ .....11 ሶላር.....12 በባትሪ የሚሰራ መብራት 13	HELECTRIC HWATCH HRADIO HTELEVSION HMOBILE HPHONE HFRIGE HCHAIR HBED HMITAD HLAMP
217	ምግብ ለማብሰል በዋናነት ቤተሰቡ የሚጠቀመው የሀይል ምንጭ ምንድን ነው [ከአንድ በላይ መልስ ይቻላል]	ኤሌክትሪክ .....1 የተፈጥሮ ጋዝ .....2 ባዮ ጋዝ.....3 ነጭ ጋዝ .....4 እንጨት.....5	HFUELELECT HFUELGAS HFUELBIO HFUELKERO HFUELWOO

		ከሰል .....6 ሳር/ቁጥቋጦ/ቅጠላ ቅጠል.....7 የእንስሳ ፍግ.....8 የእርሻ ምርት .....9 ሌላ(ይገለጽ) .....10 _____	HFUELCHAR HFUELGRAS HFUELDUN HFUELCROP HFUELOTHE
218	ለማብሰያነት የምትጠቀሙበት የተለየ የማገዶ ቤት አላቸሁ	የለም .....1 አዎ 2	HKITHCEN
219	ከሚከተሉት ውስጥ የትኞቹ የቤተሰቡ አባል አለው [ከአንድ በላይ መልስ ይቻላል]	ብስክሌት .....1 ሞተር ሳይክል/ትንሽ ዶቅዶቄ/ባጃጅ .....2 በእንስሳ የሚጎተት ጋሪ.....3 መኪና/የጭነት መኪና 4	HBICYCLE HMOTOR HCART HCAR
220	የቤተሰቡ አባል ምን ያህል የእርሻ መሬት አለው በአካባቢው መለኪያ---------- (ይገለጽ)	የአካባቢው መለኪያ ____ የእርሻ መሬት የለኝም.....00	HLANDSIZE
221	ከተዘረዘሩት የእንስሳ መሀል የቤተሰቡ አባል ምን ያህል አለው (የቤተሰቡ አባል እንስሳ የሌለው ከሆነ በሳጥን ውስጥ 00 ይጻፉ)	a)የወተት ላም፣ በሬ፣ኮርማ..... ____ b) ዶሮ..... ____ c) ፍየል ..... ____ d) በግ ..... ____ e) ፈረስ፣አህያ፣በቅሎ..... ____ f) የንብ ቀፎ..... ____	HCOWS HCHICEKEN HGOATS HSHEEP HHORISE HBEEHIVES
222	ከቤተሰቡ አባል መሀል በባንክ ውስጥ/በአነስተኛ ቁጠባ/ የቁጠባ ሂሳብ ያለው አለ	የለም .....0 አለ.....1	HSAVING

በቤት ወስጥ እንዴት ነው ቆሻሻ የምታስወግዱት? (ምርጫውን አያንብቡት፣ መጠይቁን እራሳቸው ይመልሱ፣ በመቀጠል መልሱን ይሙሉት)

223	የቆሻሻ ጉርጓድ	☐ 1=አዎ ☐ 0=አይደለም	HPIT
224	በአትክልት ቦታ	☐ 1=አዎ ☐ 0=አይደለም	HGARDEN
225	በቁጥቋጦ ቦታ	☐ 1=አዎ ☐ 0=አይደለም	HBUSH
226	በማቃጠል	☐ 1=አዎ ☐ 0=አይደለም	HBURN
227	ሌላ (ይገለጽ_____)	☐ 1=አዎ ☐ 0=አይደለም	HOTHER

መቼ መቼ ነው እጅሽን የምትታጠቢው? (ምርጫውን አያንብቡት፣ መጠይቁን እራሳቸው ይመልሱ፣ በመቀጠል መልሱን ይሙሉት)

228	መቼም አልታጠብም	☐ 1=አዎ☐ 0=አይደለም	HNIL
229	ቆሻሻው ሲታይ	☐ 1=አዎ☐	HDIRT
30	መፀዳጃ ቤት ከተጠቀምኩ በኋላ	☐ 1=አዎ☐	HTOILETUSE
231	ህፃን ልጅ ካፀዳዳሁ በኋላ (ህፃን	☐ 1=አዎ☐	HCLEANCHILD
32	ምግብ ከማዘጋጀቴ በፊት	☐ 1=አዎ☐	HFOOD
233	ምግብ ከማቅረቤ በፊት	☐ 1=አዎ☐	HMEAL
234	ምግብ ከመብላቴ በፊት	☐ 1=አዎ☐	HEAT
235	ህፃን ልጅ ከመመገቤ በፊት	☐ 1=አዎ☐	HFEEDBABY
236	ሳስታውስ	☐ 1=አዎ☐	HREMIND

Part3: ክፍል3 የበፊት የወሊድ ሁኔታ

በመቀጠልስለቀድሞእርግዝናዎእናጤናዎእጠይቆታለሁ:: ከዚህበመቀጠልስለራስዎየሚጠየቁትንጥያቄዎችእንዲመልሱልኝ በትህትና እጠይቃለሁ፡፡ (የመጀመሪያ እርግዝና ከሆነ አይሞላም)

	ጥያቄ	**መልስ**	
301	አሁን በህይወት ዘመንዎ ስለነበሩት እርግዝናዎች እጠይቅዎታለሁ:፡ምንያህልጊዜእርጉዝሆነውያውቃሉ? (በህይወትያልተወለዱትንልጆችጨምሮ), ከሌለ"00" የመዝግቡ	[_____] ጊዜ 00 ከሆነ ወደ ጥያቄ 309	
302	አሁን በህይወት ዘመንዎ ስለነበሩት ወሊዶች እጠይቅዎታለሁ:፡ ምንያህልጊዜበህይወትያለልጅወልደዋል? **[ይህማለትእስትንፋስየነበረው፣ያለቀሰወይንምሌላበወህይወትየመኖርምልክትያሳየ፤ለትንሽደቂቃወይምለትንሽለአትምቢሆንበህይወትየቆየው], ከሌለ"00" የመዝግቡ)**	[_____] ጊዜ	
303	በማህጸን ውስጥ የተከሰተ የሸል መሞት አጋጥሞዎት ያውቃል?	አዎ ……1 አያውቅም ……..0 ወደ ጥያቄ 305	
304	ካለ በማህጸን ውስጥ የተከሰተ የሸል መሞት ስንት ጊዜ አጋጥሞዎታል?	[_____] ጊዜ	
305	ከመወለጃው ጊዜው በፊት የተወለደ ልጅ ወልደው ያውቃሉ? (ከ 28 – 37 ሳምንት)	አዎ ……1 አያውቅም …….0 ወደ ጥያቄ 307	
306	ካለ ከመወለጃው ጊዜው በፊት የተወለደ ልጅ ስንት ጊዜ አጋጥሞታል? (ከ 28 – 37 ሳምንት)	[_____] ጊዜ	
307	ውርጃ አጋጥሞዎት ያውቃል? (የእርግዝና መቀረጥ ከ 28 ሳምንት በፊት)?	አዎ ……1 አያውቅም ……0 ወደ ጥያቄ 309	
308	ካለ ስንት ጊዜ ውርጃ አጋጥሞዎት ያውቃል? (የእርግዝና መቀረጥ ከ 28 ሳምንት በፊት)?	[_____] ጊዜ	

309	እርስዎ ወይም ባለቤትዎ (እንደ ባልና ሚስት አብሮ የሚኖረው ወንድ) እርግዝናን ለመከላከል ወይም ለማዘግየት ብለው የወሊድ መቆጣጠሪያ ዘዴ ተጠቅመው ያውቃሉ?	አዎ ……1 አያውቅም ……0 ወደ ጥያቄ 312	

310	እርሶዎ የትኛውን የወሊድ መቆጣጠሪያ ዘዴ ነበር እየተጠቀሙ የነበረው? ከማቆምዎ በፊት **የወሊድ መቆጣጠሪያ ዘዴዎችን አያንብቡላቸው፡፡** **(ከ አንድ በላይ መልስ ይቻላል)**	ሴቶችን በኦፐራሲዮን ማምከን …1 ወንዶችን በኦፐራሲዮን ማምከን …2 በማህፀንውስጥየሚገቡ/ሉፕ/…3 የወሊድ መከላከያ መርፌ ……4 ኢምፕላንት(ኖርፕላንት)------5 የወሊድ መከላከያ ክኒን--------6 የወንድ ኮንዶም----------7 የሴት ኮንዶም ……8 ድንገተኛ የወሊድ መቆጣጠሪያ …9 ስታንዳርድ የቀን አቆጣጠር ዘዴ … 10 ጡትበማጥባት(LAM) … 11 ቀን የመቁጠር ዘዴ ……12 የወንዱን የዘር ፍሬ ከሴትዮዋ ብልት ውጭ ማፍሰስ ……13 ሌላ ዘመናዊ ዘዴ ……14 _____ (ይገለጽ) ሌላ ባህላዊ ዘዴ ……15 _____ (ይገለጽ)	
311	ለምን ያህል ቀናት የወሊድ መቆጣጠሪያ ዘዴ ተጠቅመው ነበር?	_____ ወራት _____ አመት	
ቅድመ ወሊድ እና ድህረ ወሊድ ጤና (ከዚህ በፊት ለወለዱ እናቶች ብቻ)			

ተ.ቁ	**ጥያቄ**	የመጨረሻ ልጅ	ከመጨረሻው ቀድሞ የተወለደ ልጅ	**ይለፉ**
312.	ልጅዎት ሲወለድ/ስትወለድበጣምት ልቅነበር፣ከመካከለኛየበለ ጠነበር፣መካከለኛነበር፣ከ	በጣምትልቅ …… 1 ከመካከለኛየበለጠ …… 2 መካከለኛ ……3 ከመካከለኛያነሰ …… 4	በጣምትልቅ ……1 ከመካከለኛየበለጠ ……2 መካከለኛ ……3 ከመካከለኛያነሰ ……4	

	መካከለኛያነሰነበርወይንስበጣምትንሽነበር?	በጣምትንሽ …… 5 አያውቁም…… 99	በጣምትንሽ ……5 አያውቁም ……99	
313.	ልጅዎት በተወለደበት/ችበትሰዓትተመዝኖ/ናነበር?	አዎ ……1 አልተመዘነም ……0 አላውቅም……..99	አዎ ……1 አልተመዘነም ……0 አላውቅም……..99	
314.	የልጅዎት ክብደትስንትነበር?	ኪ.ግ ከካርድ ላይ [_____] .[_____][_____]……..1 ኪ.ግ ከሚያስታውሱት [_____] .[_____][_____]……..2 አላውቅም……99	ኪ.ግ ከካርድ ላይ [_____] .[_____][_____]……..1 ኪ.ግ ከሚያስታውሱት [_____] .[_____][_____]……..2 አላውቅም……99	

<u>ክፍል</u>4 የአሁንእርግዝናንእና የእናት አጠቃላይ የጤና ሁኔታ

ተ.ቁ	**ጥያቄ**	**መልስ**	
401	በአሁንሰአትስላለውእርግዝናበተመለከተለማርገዝአቅደሽ ነበርወይንስለመቆየትሀሳብነበረሽወይምተጨማሪልጅየመ ውለድሀሳቡአልነበረሽም	አቅጂነበር……1 ለመቆየትሀሳብነበረኝ……2 ተጨማሪልጅየመውለድሀሳብአልነበረኝም--	
402	እርጉዝከሆንሽምንያህልጊዜሆነሽ? (የመጨረሻጊዜየወርአበባመቼእንዳየችይጠይቁ)	_____ ሳምንት አላውቅም……99	
403	በዚህየእርግዝናወቅትከማንኛውምባለሙያየቅድመወሊድ (ለእርጉዞችየሚደረግ) ምርመራአግኝተውነበር?	አዎ……1 አላገኘሁም……0 ወደ ጥያቄ 421 አላውቅም……99 ወደ ጥያቄ 421	
404	ምርመራውንያደረገልዎትማነው? ሌላስ?	**ጤና ባለሙያ** ዶክትር …1 ነርስ ……2 አዋላጅ ነርስ …3 ጤና መኮንን--- 4 የጤና ኤክስቴንሽን ሰራተኛ …5 **ሌላ ሰው** ያልሰለጠነ የልምድ አዋላጅ ……6 ሌላ ……7 _____ (ይገለጽ)	

405	በዚህየእርግዝናወቅትየቅድመወሊድ (ለእርጉዞችየሚደረግ) ምርመራያገኙትየትነበር? ሌላስ?	**ቤት** በራሳቸው ቤት ……1 ሌላ ሰው ቤት ……2 **የመንግሥት ሕክምና ተቋም** ሆስፒታል ……3 ጤና ጣቢያ ……4 ጤና ኬላ …… 5 ሌላ የመንግሥት …… 6 _____ (ይገለጽ) **መንግሥታዊ ያልሆነ የጤና ተቋም** የጤና ተቋም …… 7 ሌላ መንግሥታዊ ያልሆነ የጤና ተቋም - _____ (ይገለጽ) **የግል ሕክምና ተቋም'** የግል ሆስፒታል ……9 የግል ክሊኒክ …… 10 ሌላ የግል …… 11 _____ (ይገለጽ)	
406	በዚህእርግዝናወቅትለመጀመሪያጊዜየቅድመወሊድ (ለእርጉዞችሚደረግ	[_____][_____] ወራት አላውቅም ……	
407	በዚህእርግዝናወቅትለምንያህልጊዜለእርጉዞችየሚደረግም ርመራንአግኝተዋል?	[_____] ጊዜ አላውቅም ……	
407.A	የቅድመ ወሊድ ምርመራ ህክምና መቼ ነበረ ያደረጉት?	የእያንዳንዱ የቅድመ ወሊድ ምርመራ ህክምና ቀን የቅድመ ወሊድ ምርመራ 1 (ቀን/ ወር / ዓ.ም) [____/____/_____] የቅድመ ወሊድ ምርመራ 2 (ቀን/ ወር /	
407.B	ለቅድመ ወሊድ ምርመራ ህክምና በሚሄዱባቸው (በማናቸውም ጊዜ) በእርግዝና ወቅት ስለሚያጋጥሙ ችግሮች/ምልክቶች ተነግሮዎት/ምክር ተሰጥትዎት ነበር?	አዎ……1 አልተሰጠኝም ……0 ወደ ጥያቄ 407.D አላውቅም…… 99	

407.C	ስለየትኞቹ በእርግዝና ወቅት የሚያጋጥሙ ችግሮች/ምልክቶች ነበር የተነገርዎት? **ከአንድ በላይ መልስ ማክበብ ይቻላል**	በብልትደምመፍሰስ . . . . 1 ፈጣንናበርካታየብልትፈሳሽ. . . 2 ከፍተኛራስምታት . . . . 3 የማየት ችግር/ ብዥታ . . 4 ትኩሳት . . . . .5 የሆድህመም/ቁርጠ . . . . . 6 መንቀጥቀጥ/መዝለፍለፍ . . .7 ሌላ . . . . 8 _____ (ይገለጽ)	
407.D	ለቅድመ ወሊድ ምርመራ በሚሄዱባቸው (በማናቸውም ጊዜ) ለመውለድ ስለሚደረግ ቅድመ ዝግጅት (እቅድ) ተነግሮዎት ነበር?	አዎ……1 አልተሰጠኝም ……0 አላውቅም…… 99	
407.E	ስለየትኞቹ ለመውለድ ስለሚደረግ ቅድመ ዝግጅት ነበር የተነገርዎት? **ከአንድ በላይ መልስ ማክበብ ይቻላል**	ስለሚወልዱበትቦታ . . . . 1 ለመውለድስለሚያስፈልጉየእቃአቅርቦት . 2 ለድንገተኛጊዜስለሚሆንትራንስፖርት . . 3 ለድንገተኛጊዜስለሚሆንገንዘብ . . 4 ሲወልዱ/ከዎለዱበኋላድጋፍስለሚያደርጉል ዎትሰዎች ……..5 ደምሊለግስዎስለሚችሉሰዎች . . . . . 6 ሌላ . . . . 8 (ይገለጽ)	
408	በዚህ እርግዝና ጊዜ ከዚህ በታች ከተዘረዘሩ ምርመራዎች የቅድመ ወሊድ ምርመራ አካል ሆነው ቢያንስ ለአንድ ጊዜ ተደርጎልዎ ያውቃል? a) የደም ግፊትዎን ተለክተው ነበር? b) የሽንት ናሙና ሰጥተው ነበር? c) የደም ናሙና ሰጥተው ነበር? d) ማንኛውም የጤና ባለሙያ ምን መመገብ እንዳለብዎት ነግሮዎት ነበር?	አዎ የለም a) የደምግፊት 2 1 b) ሽንት 2 1 c) የደምናሙና 2 1 d) ስለተመጣጠነምግብ 2 1	
409	በዚህ እርግዝና ወቅት ህፃኑን ከመንጋጋ ቆልፍ በሽታ ለመከላከል ቴታነስ የሚባል ክትባት በክንድዎ ወይም በትከሻዎ ላይ ተወግተው ነበር?	አዎ……1 አልተሰጠኝም ……0 ወደ ጥያቄ 452 አላውቅም…… 99	
409A	የቴታነስ ክትባት ካርድ ተቀብለው ያውቃሉ?	አዎ,ቲቲካርደአሳይተዋል . . . . . 1 አዎ,ቲቲካርድአላሳዩም . . . . . 2 አያውቁም 3	
410	በዚህየእርግዝናወቅትይህንንየቴታነስክትባትለምንያህልጊዜወስደዋል?	[_____] ጊዜ	
411	በዚህእርግዝናወቅትየደምማነስክኒንተሰጥቶዎትወይምገዝተውነበር?	አዎ……1 አልነበረም……0 ወደ ጥያቄ 417 አላውቅም…… 99	
412	በእርግዝናዎ ወቅት በሙሉ የደም ማነስ ክኒኖቹን የዋጡት ለምን ያህል ቀናት ነበር?	[_____][_____] ቀናት	

413	መልሱአዎከሆነእስከእርግዝናመጨረሻድረስእንክብሉንይ ወስዳሉ?	አዎ……1 አልወስድም ……0 አላውቅም…… 99	
414	የአይረንእንክብሉንከየትነውያገኙት?	እቤትበጤናአክስቴንሽንባለሙያበኩል…1 ጤናኬላ……2 ጤናጣቢያ……..3 ሆስፒታል……4 መድሀኒትመሸጫመደብ…5 ሌላሱቅ……6 ሌላ……99 (ይገለፅ) _____	
415	ምንጥቅምለማግኘትሲሉነውየአይረንእንክብልየሚወስዱ ት?	የደምማነስለመከላከል…1 ጠንካራለመሆን……2 ጥቅምየለውም……3	
416	እስካሁንድረስየገጠመዎትየጎንዮሽችግርአለ?	አዎ……1 አልገጠመኝም …..0 ወደ ጥያቄ 460 አላ…….. 99	
417	አዎከሆነ፣ምንአይነትየጎንዮሽችግርነውየገጠመዎት?	ድርቀት……1 የሆድቁርጠት……2 ማቅለሽለሽ…….3 የሰገራመጥቆር…….4 ሌላ……99(ይገለፅ)	
418	በዚህ የእርግዝና ወቅት የአንጀት ጥገኛ ትላትሎችን ለማስወገድ የሚረዳ መድሐኒት ወስደው ነበር?	አዎ……1 አልወሰድኩም ……0 አላውቅም…… 99	
419	በዚህ የእርግዝና ወቅት ክብደትዎን ተለክተው ነበረ?	አዎ……1 አልተለካሁም ……0 አላውቅም…… 99	
420	በዚህ የእርግዝና ወቅት ቁመትዎን ተለክተው ነበረ?	አዎ……1 አልተለካሁም ……0 አላውቅም……99	
421	በዚህ የእርግዝና ወቅት አካላዊ የሆድ ምርመራ ተደርግዎሎት ነበረ?	አዎ……1 አልተደረገልኝም ……0 አላውቅም…… 99	
422	በዚህ የእርግዝና ወቅት አልትራሳውንድ ተነስተው ነበረ?	አዎ……1 አልተነሳሁም ……0 አላውቅም…… 99	

423	በዚህ የእርግዝና ወቅት ስለአመጋገብዎ ምክር ተሰጥቶዎታል?	አዎ……1 አልተሰጠኝም ……0 አላውቅም……99	
የእናትየውን የህመም ሁኔታ የሚመለከቱ ጥያቄዎች			
424	በአሁን ሰአት ላይ በወባ በሽታ ተይዘዋል (በሀኪም የተረጋገጠ)?	አዎ……1 አልያዘኝም……0 አላውቅም……	
425	በባለፈው ሶስት ወር ውስጥ የወባ በሽታ ይዞት ያውቃል?	አዎ……1 አልያዘኝም……0 አላውቅም……	
426	ሌላ የታወቀ በሽታ አለብዎት?	አዎ……1 የለም ……0 አላውቅም…… 99 አዎካሉ ይገለፅ----------	

ክፍል 5 አልኮል, ቡና, ሻይ እና የጫት ፍጆታ

በርግዝናጊዜየሚወሰድንአነቃቂንጥረ-ነገርለማጥናትየተዘጋጁጥያቄዎችመመሪያ፡አሁንባለፉት24 ሰዓታትውስጥየቡና፣ሻይ እንዲሁምለስላሳመጠጦችአጠቃቀምንየተመለከቱጥያቄዎችንእጠይቅዎታለሁ:: (ትኩረት፡- ሰዓቱበደንብተለይቶይነገራቸው: ፡ለምሳሌ፡- 2 መጠይቁሁለትሰዓትላይከሆነከትናንት 2 ሰዓትእስካሁንድረስየተጠቀሙትንበደንብበመጠየቅይሞላ) ::

ጥያቄቁጥር	መጠጥ/የምግብአይነት	ባለፉት 24-ሰዓታት ---------ጠጥተዉ/ተመግበዉያዉቃሉ? አዎ….1የለም…2 (ኮዱንብቻ 1 ወይም2 እያሉይጻፉ)	ከየትነበርየጠጡት? ከቤት…….1 ከቤትዉጭ…2 የማሽንቡና….3 (ኮዱንብቻ 1፣2 ወይም 3 እያሉይጻፉ)	ባለፉት24 ሰዓታትውስጥስንትጊዜ_____ (ቡና/ሻይ/ቡናበወተት) ተፈላ? (በቁጥርይጻፉ)	በየትናዉመጠጫ/መመገቢያነበር_____ (ስም) የተጠቀሙት? (ፎቶያሳዩእና የሚጠቀሙትንኮድያክብቡ)	ባለፉት 24 ሰዓታትውስጥከ1ኛዉ፣ከ2ኛዉ፣ከ3ኛዉ፣ከ4ኛዉወ.ዘ.ተምንያህል _____ (ስምይጠራ) ጠጥተዋል/ተመግበዋል (በአንድጊዜሲፈላየጠጡትተደምሮበቁጥርይጻፉ)					
						ከ1ኛዉ	ከ2ኛዉ	ከ3ኛዉ	ከ4ኛዉ	ከ5ኛዉ	ከ6ኛዉ
	ቡና										
501	ጥቁርቡና				ኮድ1						
					ኮድ2						
					ኮድ3						
502	ቡናበወተት				ኮድ1						

					ኮድ2						
					ኮድ3						
503	ቡናስፕሪስ				ኮድ1						
					ኮድ2						
	ሻይ										
504	ጥቁርሻይ				ኮድ1						
					ኮድ2						
					ኮድ3						
					ኮድ4						
505	ሻይበሎሚ				ኮድ1						
					ኮድ2						
					ኮድ3						
					ኮድ4						
	ለስላሳመጠጦች										
506	ኮካኮላ				ኮድ1						
					ኮድ2						
					ኮድ3						
					ኮድ4						
507	ፔፕሲ ፔፕሲ				ኮድ1						
					ኮድ2						
					ኮድ3						
					ኮድ4						

Food frequency questionnaire (other toxic exposure)

508	በዚህ እርግዝና ወቅት አረቄ (ጠላ፣ጠጅ) ወይም ቢራ ይጠጣሉ? (እባክዎን የመጠጡን አይነት እዚህ ይግለጹ ([_____])	አዎ .....1 አይ .....0→**ጥ 512** አላስታውስም .....99→ **ጥ512**	
509	በዚህ እርግዝና ወቅት በየቀኑ [የመጠጥ አይነት] ትጠጫለሽ?	አዎ .....1 አይ .....0 አላስታውስም 99	
510	አዎ ከሆነ, በቀን ምን ያህል [መለኪያ/ጠርሙስ]ትጠጫለሽ	[_____] መለኪያ/ጠርሙስ/ በቀን	
511	አዎ ከሆነ, በሳምንት / በወር/ ምን ያህል [መለኪያ/ጠርሙስ]ትጠጫለሽ	[_____] መለኪያ/ጠርሙስ/ በሳምንት [_____] መለኪያ/ጠርሙስ/ በወር አላውቅም……....99	
512	በዚህ እርግዝና ወቅት ጫት ይቅማሉ?	አዎ .....1 አይ ----------.0→**ጥ516**	

		አላስታውስ----------99→**ጥ516**	
513	በዚህ እርግዝና ወቅት በየቀኑ ይቅማሉ?	አዎ .....1 አይ .....0 አላስታውስም 99	
514	አዎ ከሆነ, በቀን ምን ያህል[ጥቅል] ይቅማሉ?	[_____] ጥቅል በቀን	
515	አዎ ከሆነ, በሳምንት / በወር/ ምን ያህል [ጥቅል] ይቅማሉ?	[_____] ጥቅል በሳምንት [_____] ጥቅል በወር አላወቅም……....99	
516	ሲጋራ አጭሰው ያውቃሉ ?	አዎ----------1 አይ ----------.0→**ጥ 601** አላስታውስ----------99→**ጥ 601**	
517.	በዚህ እርግዝና ወቅት ሲጋራያጨሳሉ ?	አዎ----------1 አይ ----------.0→**ጥ601** አላስታውስ----------99→**ጥ601**	
518.	ባለፈው 24 ሰአት ውስጥ ምን ያህል ሲጋራ አጭሰው ነበር?	[]በቁጥር አላወቅም……....99	
519.	ከቤተሰብ አባላት ሲጋራ የሚያጨስ ሰው አለ?	አዎ .....1 አይ .....0 አላወቅም 99	

ክፍል 6. የድህረ ወልድ የህፃን መረጃ መጠየቅያ እና አንትሮፖሜትሪ **ድህረወሊድጉብኝትከወሊድበኋላ(1-3 ቀን)** **የመጠይቁመለያ** _____			
ድህረወሊድጉብኝትከወሊድበኋላ(1-3 ቀን) **የመጠይቁመለያ** _____			
601	መጠይቁየተሞላበትቀን	_____ _____ (ቀን /ወር/ ዓ.ም)	
602	የጥናቱቦታ	ቀበሌ _____ ጎጥ _____	
603	መረጃሰብሳቢ	ስም _____ ፊርማ _____	
604	ህፃኑ/ኗየተወለደበት/ችበትቀን	_____ _____ (ቀን /ወር/ ዓ.ም)	
605	ህፃኑ/ኗየተወለደበት/ችበትሰዓት	ሰዓት |_____|_____| ደቂቃ |_____|_____|	
606	የህፃኑ/ኗጾታ	ወንድ …….....……1 ሴት…….....…...…...…… ….. 2	
607	የወለዱትመንታነው ?	አዎ…….....…….. .....1 የለም ....…2	**የለምከሆነ ወደ 610 እለፍ**
608	አዎከሆነስንትልጅነውየወለዱት?	|_____|_____|	
609	ስንቶቹበህይወትተወለዱ?	|_____|_____|	
610	ቃለመጠይቁበሚደረግበትወቅትያለ የህፃኑሁኔታ	በህይወትአለ(ቤትውስጥ).....1 በህይወትአለ (ሆስፒታልውስጥ) --.2 በህይወትየለም.....3	
611	ህፃኑየሞተከሆነየሞተበትቀን	_____ _____ _____ (ቀን/ወር/ዓ.ም)	
612	የህጻኑክብደት	_____ግ	
መረጃሰብሳቢ፡ውርጃወይምየሽልመሞትለገጠማቸውእናቶችብቻይጠይቁ			
Q604	ወርጃ/ሽልመሞትያጋጠመበት	_____ _____ _____ (ቀን /ወር/ ዓ.ም)	

Annex III: Locally Available Serving Sizes for Different Caffeine source

501. Black coffee

Code1 code2 code3

ጥያቄቁጥር 502 (በናበወተት)

ኮድ: 1 ኮድ: 2 ኮድ: 3

ጥያቄቁጥር 503 (ቡናስፕሪስ)

ኮድ: 1

98 ሚ. ሊ

ኮድ: 2

110 ሚ. ሊ

ጥያቄቁጥር 504 (ጥቁርሻይ)

ኮድ: 1

100 ሚ. ሊ

ኮድ:2

110 ሚ. ሊ

ኮድ: 3

130 ሚ.ሊ

ኮድ: 4

136 ሚ.ሊ

ኮድ: 5

ጥያቄቁጥር 205 (ሻይበሎሚ፣አብሮየተፈላ)

ኮድ: 1 ኮድ: 2 ኮድ: 3 ኮድ: 4

ለስላሳመጠጦችጥያቄቁጥር 506 (ኮካኮላ)

ኮድ: 1 ኮድ: 2 ኮድ: 3 ኮድ: 4

ጥያቄቁጥር 507 (ፔፕሲ)

Annex IV: English version participant's information sheet

Hello, my name is _____and I am here on behalf of Getachew Buko a post graduate student from Addis Ababa University, College of Health Sciences School of public health. I am here to collect some information on effect of coffee consumption on low birth weight from the study participants.

Title of the study: Effect of caffeine consumption on low birth weight Butajira, SNNPR, Ethiopia

Benefit of the study: There is no direct benefit for participating in this study. However, the findings of this study will be used to know the magnitude of the problem and important to improve pregnancy outcome.

Risk: There is no risk posed to the participants for participating in this study.

Right of participants: Your participation is voluntary and you are not obligate to answer any question you don't wish to answer. If you felt discomfort with the interview, you can with draw any time after you get involved in the study. You can take time to understand and decide on your participation in the study.

Confidentiality: Your name will not be written in this form and will never be used in connection with any information you tell us. All information given by you will be kept strictly confidential.

Duration of the interview: This interview will take about 15---20 minutes.

Contact address: If you have any question which is not clear to you can contact the investigator or Research and Ethical Committee of Addis Ababa University.

Investigator: Getachew Buko

Mob +251-910023950

Email :getacho2013@gmail.com

Addis Ababa University, college of health science, school of public health

Annex V: Informed consent form

I have read this form or it has been read to me in the language I understand, all conditions sated above.

Therefore; 1. I agree to participate 2. I do not agree

Date of interview ----------Time started ---------- Time completed----------
----Result of interview

1. Completed 2. Respondent not available 3.Refused 4.Partially completed

If no, skip to the next participant by writing reasons for his/her refusal.

Data collector name ----------Signature ----------Date----------
----

Checked by

Supervisor name ---------- Signature ----------Date----------
----

Annex V: Amharic Version Participant's Information Sheet

የተሳታፊዎችመረጃቅፅ፡

ጤናይስጥልኝ! ስሜ----------እባላለሁ፡፡እዚህ የመጣሁት በአዲስአበባ ዩኒቨርስቲ ጤና ሳይንስ ኮሌጅ የህብረተሰብ

ጤና ትምህርትቤት የድህረ ምረቃ ተማሪ የሆኑትን ጌ**ታቸው** ቡ**ኮ**ወ ከዬነው፡፡የመጣሁበት አላማም

የድህረ-መረቃ ተማሪው የመመረቂያ ጥናታቸውን ሁረጉዙ ሴቶች ካፌን አጠቀቀም ጨቅላ ሂጸን ኪብደት ላህተጽኖአላዉ

የምሎን መረጃ ለመሰብሰብነው፡፡ስለጥናቱ የሚከተሉትን ነጥቦች ከተገነዘቡ በኋላ ፈቃደኛ ከሆኑ በቃ-ለመጠየቁ

እንዲሳተፉ በትህት ና እጠይቀዎታለሁ፡፡

የጥናቱዕርስ: -ሁረጉዙ ሴቶች ቡና አጠቀቀም ጨቅላ ሂጸን ኪብደት ላህተጽኖ አላዉ የምል ጥናት ነው፡፡

የጥናቱ ጥቅም: ይህጥናት በቀጥታ ለተሳታፊወች የሚሰጠው ጥቅም የለም፡፡ይሁ ንእንጂ የዚህጥናት

ግኝት የችግሩን ስፋት ለማወቅ ና የሥራ ላይደህንነት ሁኔታን ለማሻሻል እንዲሁም የግንዛቤማስጨበጫ ጥቅም ላይይውላል፡፡

ጉዳት፡እዚ ህጥናት ላይ በመሳተፍተሳታፊዎች ላይ ምንም አይነት ጉዳት አይደርስባቸውም፡፡

የተሳታፊዎቹመብት: በዚህ መጠይቅ ተሳትፎ በእርሶ በፈቃደኝነት ላይየተመሰረተነው፡፡የማይፈልጉትን

ማንኛውም ጥያቄ ለመመለስ ግዴታ የለብዎትም፡፡በቃለ-መጠይቁ ላይ ጥሩ ስሜት ካልተሰማዎት

በየትኛውም ጊዜ ማቋረጥ ይችላሉ፡፡በጥናቱ ውስጥተሳትፎዎን ለመረዳትና ውሳኔለማድረግ ጊዜ መውሰድ

ይችላሉ፡፡ሚስጥራዊነት፡ተሳታፊወች ስማቸውን እንዲጠቅሱ አይጠበቅም፡፡ማንኛውንም ተሰታፊየሚሰጠውን

መረጃበሙ ሉሚስጥራዊነቱ እንዲጠበቅ የጥናቱ ስነምግባር ያስገድዳል፡፡በመሆኑ ምተሳታፊዎች የሚሰጡት መረጃሚ ስጥራዊነቱ ይጠበቃል፡፡

የቃለ መጠይቁ ርዝመት፡ይህቃ ለመጠይቅከ 15---- 20 ደቂቃ ያህልይወስዳል.

አድራሻ: ያልገባዎት ማንኛውም ጥያቄ ቢኖ ርየጥናቱ ንባለቤትወይም አዲስ አበባ ዩኒቨርሲቲ የምርምርና

የሥነምግባር ኮሚቴውን ማነጋገር ይችላሉ፡፡

የጥናቱባለቤት: **ጌታቸውበኮ** ስልክቁ. +251-910023950

Email፡**getacho2013@gmail.com**

Annex VI Amharic version Informed consent form

የፈቃደኝነትመግለጫቅፅ፡

ከዚህበላይስለጥናቱየተጻፈውንመግለጫበሚገባኝቋንቋአንብቢወይምተነቦልኝተረድቻለሁ፡፡

በመሆኑምበዚህ፣

1. እስማማለሁ 2.አልስማማም

መልሱአልስማማምከሆነአመስግነውመጠይቁንያቋርጡ፡፡ለጥናቱፈቃደኛያልሆኑበትን

ምክንያትበመጠየቅናበማስታወሻላይበመያዝለጥናቱተቆጣጣሪሪፖርትያድርጉ፡፡

የቃለመጠይቁቀን ----------የተጀመረበትጊዜ ---------- የተጠናቀቀበትጊዜ----------
የቃለመጠይቁውጤት

1. ተጠናቋል 2. መልስሰጪውአልተገኘም 3. ፍቃደኛአልነበሩም 4. በከፊልተጠናቅቋል

የመረጃሰብሳቢውስም ----------ፊርማ ----------ቀን----------ያረጋገጠው፡

Annex VII. Informed Consent

Voluntary participation

Your participation in this research study is voluntary. You may choose not to participate and may withdraw your consent to participate at any time. You will not be penalized in any way should you decide not to participate or to withdraw from this study. No compensation expected for your participation (neither monetary nor any other incentive). However, your participation will be highly appreciated to know about caffeine consumption on birth outcome and for intervention of caffeine intake limitation or decaffeinated by establishing processing industry.

Participant: I have read this consent form and have been given the opportunity to ask questions. I give my consent to participate in this study.

Principal Investigator Signature _____

Participant's Signature_____ Date_____ OR Thumb Print_____

Annex- VIII. Curriculum vitae of the investigators

Personal information of principal investigator

- Full name……Getachew Buko Hayu
- sex ……..Male
- Age ……33
- Nationality ……. Ethiopian
- Marital status ……Married
- Address…….. Ginchi
- date of birth ……1978
- Health condition…… normal
- Phone …….. 0910023950

Key personal qualities: - I am open-minded and free to accept others responsibility to take a reasonable decision. I have also willingness to obeying rules and standard of working environment hardly.

Behavior: - Ethical, sociable, Respectful, hard worker, quick learner and ability to work with others.

Educational Backgrounds

School	Level age	Place of education	Starting year E.c	Last E.c year
Elementary school	1-8	Shukutie elementary school	1985	1993
Secondary and preparatory school	9-12	Ginchi senior high and preparatory school	1994	1998
Higher Education				
Bsc. in public health officer	4 years	Hawassa University	1999	2002
MBA	2 years	Lead star University	2006	2007

Languages: Afan Oromo, English, Amharic: listen, Speak, Read and Write

Hobbies: - I always enjoy reading Bibles, Books, playing with children and elders.

Professional work experiences and position: I have 9 years work experience (3 years as health service provider, 4 years as head of Ginchi health center.2 year on master in leadership at lead star university

Some Merits received

Masters in MBA **CGPA-3.83 and** Research-**Excellent grade**

Personal Information primary advisor

First name: Bilal Middle name: Shikur Last name: Endris

Age: 29year Sex: Male Marital status: Married and father of a son

Place of Birth: Addis Ababa, Ethiopia Date of Birth: 1 October, 1986

Nationality: Ethiopian, Language: Amharic, English and Arabic: Speak, Read and Write

Email: lebiluka@yahoo.com, Phone number (mobile): +251911-47-53-75, P.O.Box: - 5657

Academic Qualification

1. **Masters of Public Health in Epidemiology (MPH):** September 2012- July 2014

2. Degree of Doctor of Medicine (MD): January 2006-September 2011

Work Experience

Assistant Professor of Public Health: Since July, 2014

Institution: Addis Ababa University, School of Public Health

Lecturer: September, 2011 – June, 2014

Institution: Addis Ababa University, School of Public Health

Co-PI of Addis Ababa Mortality Surveillance Program: June, 2014 -July, 2015

PI of Addis Ababa Mortality Surveillance Program-Since July, 2015

Research experience

Assessment of the relationship between malnutrition and malaria among under-five children in Adami Tulu district: A case-control study ***(Shikur* B**, Deressa W, Lindtjorn B, BMC Public Health. © *Shikur et al. 2016***(16:174)**

Assessment of the magnitude and factors associated with exclusive breast feeding among employed and unemployed mothers: a comparative cross sectional study (under review, PLOSE ONE)

Advised more than 10 masters students

Some Merits received: AMREF young African research scholarship award winner

PI in a research award by Addis Ababa University-Medical Education Partnership Initiative (MEPI)

Masters in Public Health with **CGPA-3.97 and** MPH Research-**Excellent grade**

Personal Information co- advisor

Yalemwork GetnetMengistu (BSc in health officer, MPH), Sex-F, Age 28, Marital status-Married, Place of Birth-South Gondar Cell phone +251913203199/+251911384327, Email-yalemworkgetnet@gmail.com

Educational Background: Received MPH from Jimma University on June 2012 G.C, Received BSc. Degree in Public Health from Jimma University on June 2007, Received Diploma in Computer Science from mercury computer training center (south west shewa,Woliso) Received certificate from Tewodrose II preparatory school on June, Received certificate from MekaneYesus secondary school on 2002

In service training: Health research methods and ethics, ART & management of Opportunistic Infection, Prevention of mother to child transmission HIV (PMTCT), Syndromic Management of STIs, Provider Initiated Counseling and testing, Pedagogical training, Modularization training, Anti-corruption training, BSC planning, KAIZEN application

Conferences, Seminars and Workshops: Participated on the annual conference of EPHA, Participated on the 13th world congress on public health from 23-27 April 2012, Participated on the annual conference of Ethiopian public health officers association (EPHOA), Participated on national harmonization and modularization (Member of public health officer harmonization and modularization).

Professional membership: Member of EPHA since March 2012 and Ethiopian cancers association since April 2012

Key Competency/Skills: Excellent Skill In Windows, Microsoft Word ,Excel, MS power point, Access and data base management (SPSS, Epi-data, epi info, WHO antro plus).

Professional work experiences and position:

I have 9 years work experience (3 years at hospital level, 2 years while attending second degree course and 1 year as a lecturer and as a department head in public health department at Wachemo University (found in SNNP, Hadiya zone), 1 year as a lecturer at Addis Ababa Science and technology University 2 school of medicine and health sciences and 2 years as a lecturer at Addis Ababa University college of medicine and health sciences. Generally I have worked in health programs for both nongovernmental and governmental organizations in

curative &prevention aspect of health sector activities besides the teaching and learning activities.

I have worked in St. Luke catholic hospital and college of nursing and midwifery as a clinician and as an instructor working in different wards (medical ward, obstetrics and gynecology ward, surgical and orthopedic ward, pediatrics ward) and different outpatient departments (OPDs). I have worked in antiretroviral therapy (ART) clinic and maternal and child health (MCH) Department. Starting from September 11/2012 to October 10/2013, I have also worked at Wachemo University as a department head in department of public health and as a lecturer besides extracurricular activities. Currently I am working as a lecturer in college of medicine and health sciences at Addis Ababa University.

Research Experiences: I have done four researches, of which tow were published in reputable journals and advising more than 15 students.

Additional duties: I am members of the national curriculum development and harmonization team for public health program**;**performPublic health program evaluation at Addis Ababa science and Technology University, served in several committeespositions

Language Proficiency: Excellent user for both Amharic and English to listen, Speak, read and Write.

References:

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Assurance of Principal Investigator

The undersigned agrees to accept responsibility for scientific ethical and technical conduct of the research thesis and for provision of required progress reports as per terms and conditions of the research publications office in effect at the time of grant is forwarded as the result of this application.

Name of the student: Getachew Buko

Date: November, 2018

Approval of primary advisor

Name of primary advisor: Dr. Bilal Shikur

Date signature