ADDIS ABABA UNIVERSITY

COLLEGE OF HEALTH SCIENCES

SCHOOL OF PUBLIC HEALTH

ASSESSMENT OF LOW BIRTH WEIGHT AMONG CHILDREN BORN TO ELDER WOMEN AND ITS ASSOCIATED FACTORS IN ADDIS ABABA, ETHIOPIA

BY: - MESERET MELAKU

A THESIS SUBMITTED TO THE SCHOOL OF GRADUATE STUDIES ADDIS ABABA UNIVERSITY, COLLEGE OF HEALTH SCIENCE, SCHOOL OF PUBLIC HEALTH, IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR DEGREE OF MASTERS IN PUBLIC HEATH

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Mar, 2021

Addis Ababa, Ethiopia

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Acronyms

AAU: Addis Ababa University

AOR: Adjust Odd Ratio

ANC: Antenatal Care

APH: Ante Partum Hemorrhage

BMI: Body Mass Index

CI: Confidence Interval

EDHS: Ethiopian Demography and Health Survey

GA: Gestational Age

GDM: Gestational Diabetes

HTN: Hypertension

IFA: Iron and Folic Acid

LBW: Low Birth Weight

LNMP: Last normal menstruation period

MUAC: Mid Upper Arm Circumference

OBY/GYNE: Obstetrics and Gynecology

PROM: Premature Rupture of Membranes

USA: United State of America

VLBW: Very low birth weight

WHO: World Health Organization

ABSTRACT

Background: Birth weight is the single essential factor determining the survival, growth, and development of infants**.** LBW is defined by the WHO as weight at birth less than 2500 gram, while very LBW is considered as a; birth weight less than 1500gram, on the other hand very extremely LBW a; birth weight less than 1000gram, regardless of gestational age. Pregnancy after the age of 35 confers risk to both child and maternal health it has been broadly documented. In particular, positive association between old maternal age and risk of LBW and preterm birth. Neonatal mortality is 20 times higher among LBW babies compared to their counterparts. **Objective:** To assess the prevalence of LBW born to older women and its risk factors in Addis Ababa, Ethiopia 2020.

Method: Institutional based cross-sectional study was conducted from Oct 2019 to DEC 2020, in Addis Ababa, Ethiopia. A total of 625 old age women delivered in health institutions were selected by using systematic random sampling. Data were collected using an interviewer-administered structured questionnaire. The collected data were coded and entered into the computer using Epi Data version 3.1 and the data were analyzed using STATA version 15 descriptive statistics was carried. In addition binary logistic regression model was used to determine the association between different factors and low birth weight. Finally, adjusted odds ratio results from a multivariate logistic regression were used to measure the strength, direction, and significance of the association between the different independent variables and low birth weight, the dependent variable. The level of significance was decided to be when $p < 0.05$, that given a 95% confidence interval for the test statistic.

Result: The prevalence of low birth weight was found to be 15.04 % (95% CI 12.4-18.1). Age of the mothers (40-49 years) [AOR=[AOR=3.16: 1.06, 9.46]], low-income status [AOR=4.33:1.24, 15.19], mothers who had mid-upper arm circumference less than 23cm [AOR=4.49:1.26,16.02], mothers who gave birth before 37 weeks gestational age [AOR=6.87:2.76,17.07], mothers who had a previous abortion history [AOR=4.22:1.45,9.66] and those who had pregnancy-induced hypertension [AOR=5.80:2.23, 15.18] were more likely associated with low birth weight.

Conclusion: The prevalence of low-birth-weight is high compared with national studies among elderly mothers. Age group, monthly family income, mid-upper arm circumference, gestational week, history of abortion and pregnancy induce hypertension were found to be significantly associated with LBW.

1. INTRODUCTION

1.1. Background

Low birth weight (LBW) is defined by the World Health Organization as weight at birth less than 2500 gram, while very low birth weight is considered as a; birth weight less than 1500gram, on the other hand very extremely low birth weight is a; birth weight less than 1000gram, regardless of gestational age. The birth weight of an infant is an essential health status indicator and is a basic factor that determines the neonate's physical growth, mental development, and survival. It also indicates the previous and current health status of the mother (1).

Old maternal age is commonly defined as when a mother age older than 35 years at the time of delivery, whereas very old maternal age is defined as when a mother's age older than 45 years at the time of delivery. Similarly, advanced maternal age is usually defined as being 35 years or older which is believed to predispose mothers to enormous adverse outcomes during pregnancy (2, 3). Advanced maternal age is considered the main risk factor for both negative pregnancy outcomes and perinatal outcomes in both low- and high-income countries (4-6). Pregnancy after the age of 35 years can be a challenge because of maternal and fetal risks (7). Old maternal age continues to be associated with a range of adverse pregnancy outcomes, including gestational diabetes mellitus, placenta previa, and preeclampsia (8, 9) and increased risk of intrauterine fetal death, operative vaginal delivery and cesarean delivery(10), and preterm birth, low birth weight infants, birth defects (11-16).

1.2. Statement of the problem

Globally, about 18 million LBW infants are born each year, more than half, 9.3 million of them are in South Asia, and 3.1 million are in Sub-Saharan Africa. LBW is a public health problem almost all over the world with a Global magnitude of 15.5%. The majority Low birth weight children result in poor health outcomes in future life and more than 95% of them being born in low-income countries (1).

Low birth children have more respiratory, cognitive, and neurological problems compared to their counterparts(17-20), (21), (22). Neonatal mortality is 20 times higher among LBW babies compared to their counterparts. Infants weighing less than 2500 gram has many negative health consequences. It contributes to 60% to 80% of all neonatal morbidity and mortality. (23) (24, 25). It is closely related to fetal and neonatal morbidity, chronic diseases in life, and inhibited growth and cognitive development (26). In general, birth weight is strongly associated with neonatal mortality, postneonatal, infant mortality, and childhood diseases. LBW is a high incidence phenomenon that affects a greater percentage of the population, particularly in the developing countries of Asia and African (1). Accordingly, WHO sets a policy and recommends member countries to target reduction of to decrease low birth weight by 30% by the end of 2025 (27).

The best time to get pregnant is between the late 20 and early 30 years of age. There are ample evidence that shows how pregnancy after the age of 35 confers risk to both the child and the mother (28). Most evidences show that advanced maternal age is associated with an increased risk of low birth weight, even after adjustment for parental characteristics (11-16). A study conducted in India showed that about 13.2% prevalence of LBW infant. Another study from the same country found that 14 % of babies born to mothers aged 35 years and above had a low birth weight. (7, 29). A study conducted in Korea for all live births from 1993 to 2016 shows that the prevalence of low birth weight was found to be greatly increased in the group of maternal age greater or equal to 35 years old 4.8% in 1995 to 23.9% in 2015 (30). A study done in Iran showed that both multiparous and nulliparous mothers aged maternal age $\geq$ 40 years old had an LBW of 39.2% and 21.5% respectively(31). A similar Study in Iraq showed that low birth weight is 23% and 22% among women aged between 35-40 years and aged 40 years and above, respectively(32). The prevalence of LBW among mothers aged 40 years and above in Pakistan is

14%(33). A study was done in 29 countries (Africa, Asia, Middle East, and Latin America) revealed that the magnitude of LBW with advanced maternal age was 12.3%(34).

In the developing world, greater than 20 million low birth weight babies are born each year. The prevalence of low birth weight ranged from 6% to 18% across the World with Sub-Saharan Africa accounting from 13% to 15%(1). In a study in South Africa, the low birth weight was significantly greater among advanced aged women 27.9%(35). In Cameroon among 585 women aged 40 or above who delivered between January 2007 and December 2011, the prevalence of LBW showed 11% and 8.3% among multiparous and Prim parous and mother aged 40 years and over respectively(36).

In Ethiopia, in the year 2014, there were 27,243 mortalities due to LBW accounting for 4.53% of the total mortalities(37). According to the 2016 EDHS, LBW among mothers age 35-49 years was (10.8%) (38). A study conducted in Jimma showed that elder mothers aged 35-49 (14.3%) had a higher risk of delivering low birth weight infants (39). Another study in Bahirdar showed that women whose age range 35 years and over had a 60% high risk to have low birth weight (40).

Globally, has extensively explored the association of advanced maternal age with adverse obstetrical and perinatal outcomes. However, few researches have been conducted to identify the association of advanced maternal age with these outcomes in the study area and Ethiopia. Hence, there is a need to carry out research to determine the magnitude of low birth weight associated with old maternal age. On the other hand, identifying the outcomes of advanced maternal age pregnancy will be useful in designing effective sensitization programs for couples and empowering them about informed choices for pregnancies during advanced maternal age. Furthermore, the result of this study can be utilized by concerned bodies to optimize natal care given for advanced aged mothers.

1.3 Significant of the Study

Birth weight is strongly related to infant and neonatal mortality, childhood morbidity, and various diseases in adulthood, including diabetes, hypertension, and cardiovascular conditions. LBW is a public health problem in almost all over the countries of the globe (1). In developed countries and other parts of the world prevalence and associated factors of low birth weight among children continue to grow, as an awareness of the consequences increases and minimizes low birth weight. Knowledge of factors affecting the birth weight of a baby is vital to prevent unwanted developmental and health-related complications. The intervention that includes primary and secondary prevention has been done and continues to be worked specifically for old age women at health institutions and community level. This study will add knowledge and fill the gap regarding the relationship of birth weight with old maternal age and there was no adequate study on determinant factors of birth weight particularly old maternal age in our country and give direction for other researchers who are interested in this area. The findings of the study will also help health professionals to improve and focus on the nutritional services given to mothers during their pregnancy and counsel couples, who seek to have a child in their later ages, about the risks of advanced maternal age pregnancy.

2. LITERATURE REVIEW

2.1. Literature Overview

There are no adequate and recently updated studies that were conducted especially in Ethiopia and few studies are done to focus on associated factors for low birth weight among old age woman. Therefore there is a need to have such a study among old age women. So this study will try to fill the gap that wasn't covered by other literature.

2.2. The Magnitude of Low Birth Weight

The prevalence of low birth weight show variation among different sections of the Globe. A study done in the United States among advanced aged woman who gave birth from 1989 to 1991, showed that the prevalence of low birth weight was 10.6%, 7.6%, 5.3%, and 4.9% among African Americans, Puerto Ricans, Mexican Americans, and non-Hispanic whites respectively (41). According to a study in Japan from January to December 2011, the prevalence of LBW babies among mothers above 40 years of age was 26 (17.1%) (42).

A study was done in 29 countries (Africa, Asia, Middle East, and Latin America) revealed that the magnitude of LBW with advanced maternal age was 12.3% (34)

A study done in India from July 2015 to June 2016 among 288 women aged 35 years and older showed that 13.2% (30) of neonates were Low Birth Weight babies. Another study from the same country among Women aged 35 years and above delivered 14 % low birth weight infants. A retrospective community-based cross-sectional study done in India among 40yrs years and above showed that the prevalence of LBW babies was 54.4% (7, 29) and (43).

A study was conducted in Korea for all live births between 1993 and 2016, the prevalence of low birth weight among maternal aged 35 years old and above 4.8% in 1995 to 23.9% in 2015(30). A similar study was done between 2005 and 2008 in South Korea showed that the prevalence of low birth weight babies was 5.1% among women age 35-40 years and 6.3% among women aged above 40 years, respectively(44).

A Cross-sectional study done in Southeast Iran between March 2014 and March 2015 showed that the prevalence of low birth weight infants was 12.3% (641) among old age women (45). A study conducted in Qatar from January 2010 to April 2011 among women 35 years of age and

above showed that the prevalence of low birth weight babies was 196(22.7%) (46). In a study conducted in Pakistan between July 2011 to Dec 2011 among women aged 40 & over the prevalence of LBW infants was 14% (33).

The prevalence of low birth weight is higher among sub-Saharan countries. A study conducted in South Africa among old age women showed that the prevalence of LBW was 27.9%27.9% (35). A retrospective cohort study conducted in Cameroon between January 2007 and December 2011 among maternal age 40 and older showed that the prevalence of LBW was 8.3% and 11% among Prim parous and Multiparous women, respectively(36).

A study conducted in Jimma, Ethiopia from June 1999 to July 2000 among 1441 women who delivered at Jimma hospital showed that advanced age women were 14.3%, low birth weight babies. Another study was done in Jimma medical center from May 2015 GC to April 2017, G.C, showed that the prevalence of low birth weight was 21 (8.4%). (39), (47). According to the study in Bahirdar, Ethiopia between March 18 and May 18, 2015, showed that mothers whose age was 35 years and above had a 60% high risk to have low birth weight (40).

2.3 Factors associated with low birth weight

2.3.1 Socio-demographic and economic factors

Maternal age was the main factor in LBW infants and the prevalence of LBW increased with an increase in maternal age. A retrospective study conducted in Japan in 2011 shows that pregnant women whose age was 35 years and over were 1.97 times more likely to deliver low birth weight infants. (42)

Similarly, a retrospective community-based cross-sectional study was done on Socio-Biological Determinants of Low Birth Weight in India showed that a woman whose age was 40 years and above was 54% higher risk of delivering LBW (43).

A study from 2005 to 2008 in South Korea showed that advanced maternal age a risk factor for low birth weight (AOR 1.2 and 1.6 for women aged 35–39 years and ≥40 years, respectively)(44).

A population-based retrospective cohort study conducted among older age women in Belgium from January 2002 to December 2003 shows an increased prevalence of low birth weight (AOR 1.69, 95% CI 1.47–1.94) (48).

A multicenter, cross-sectional study done in 359 health facilities in 29 countries from Africa, Asia, Latin America, and the Middle East from May 2010 to December 2011 showed that older maternal age was a higher risk of delivering LBW infants (AOR 1.1, 1.4, and 1.2 for a woman aged 35-39, 40-45 and ≥45 old years, respectively) (34).

A systematic review and meta-analysis were conducted for 44 studies showed that maternal age 35 years and above was a higher risk of delivering LBW infant (OR 1.10 and 1.46 for a woman aged 35-39 and ≥40 old years, respectively(49).

An institution-based, retrospective, cross-sectional study was conducted based on the hospital's medical register of mothers, Addis Ababa, Ethiopia suggested that pregnant women whose age was 40 years and over were 1.96 times higher risk of having an LBW baby (50). A chart review retrospective comparative cross-sectional study was conducted between November and December 2017 to assess the association of advanced maternal age pregnancy with adverse obstetric and perinatal outcomes in Mekelle Ayder Comprehensive Specialized Hospital, Northern, Ethiopia showed that advanced age women were three times high risk more to delivered LBW (51).

A prospective case-control study, involving 851 newborns from February 2001 to October 2002 in Lithuania showed that the unstable marital status was 2.2 (AOD 95% CI 1.63–2.98) times more likely of LBW baby compared to married women (52).

A facility-based cross-sectional prospective study was carried out in the city of Ibadan, the capital of Oyo State, Nigeria in 2011 showed that, single women 32.3% higher risk for delivering LBW infant than married women (53).

An unmatched case-control study was conducted from Jan to Mar 2017 in three public hospitals in North Shewa zone, Central Ethiopia showed that single women had three times higher risk for delivering LBW infants than married women. (54)

A cross-sectional study in Malaysia showed that the ethnicity of the woman was significantly associated with low birth weight infants. Studies done in the USA and Qatar showed that, the same result(41), (55), (46). A retrospective community-based cross-sectional study done in India in 2010, suggested that Muslim women had more low birth infants. (p=0.0001) (43).
An unmatched case-control study was done from Jan to Mar 2017 in three public hospitals in North Shewa zone, Central Ethiopia showed that Protestant Christians had three times higher risk for delivering LBW infants. (54)

A prospective study conducted between July 2015 and June 2016 in India among old-age women showed that educational status especially educated up to secondary were at a higher risk of low birth weight baby (7). , A retrospective community-based cross-sectional study done in India in 2010 showed that a high proportion of low birth weight babies were found among uneducated women 41.3% and 28.1% mothers with primary school education (43). A Cross-sectional study done in Southeast Iran from March 2014 to March 2015 showed that mothers with illiterate and primary school education had a high odd of delivering low birth weight AOR (1.91 and 1.60 respectively)(45).

A case-control study was done at two main tertiary hospitals in Qatar from January 2010 to April 2011 showed that those who have primary school education were more 1.6 (95% CI 1.2-2.1) times more likely to have a chance to give LBW babies (46).

A facility-based cross-sectional prospective study was carried out in the city of Ibadan, the capital of Oyo State, Nigeria in 2011 showed that the mother's education below secondary school education was two times (AOR=2.37; CI=1.19-4.50) more likely for having low weight infants. (53).

A prospective case-control study from February 2001 to October 2002 among old age in Lithuania showed that higher risk for having a low weight baby had mothers with primary and secondary school education (OR 3.4 and 1.6 respectively) (52).

An unmatched case-control study was conducted from Jan to Mar 2017 in three public hospitals in the North Shewa zone, Central Ethiopia showed that mothers with informal education had a higher risk for having a low weight baby (54).

An institution-based case-control study was conducted from April to December 2016 in Bale South-East Ethiopia showed that Mothers who had informal education were increased odd of giving to LBW newborns (AOR=6; (95 % CI= 1.34–26.90)(56). On the other hand, studies in Jimma, Southwestern Ethiopia, showed that a significant association was not seen between the educational status and LBW infants (p> 0.05) (39),

A case-control study done on Assessment of maternal risk factors associated with low birth weight neonates at a tertiary hospital, in Indi, showed that Partners who had primary education were (18.13%), higher odds for delivering an infant with LBW (57).

An institution-based case-control study design was conducted from April to December 2016 in the North Wollo zone, Ethiopia showed that fathers being illiterate were 4 (AOR: 4.09; 95% CI 1.45, 11.50) times more likely to have low birth weight (58). On the other hand, an institution based case-control study design was conducted between April and December 2016 in Bale South-East Ethiopia showed that partners who had illiterate were statistically significant associated with low birth weight infants (56).

A retrospective community-based cross-sectional study done on Socio-Biological Determinants of Low Birth Weight in India showed that housewives woman delivered a maximum (42.5%) the proportion of LBW (43). Similarly, a case-control study was carried out in the postnatal ward of a tertiary care hospital from January to July 2014 in India showed that maternal occupation was found to be statistically significant with low birth infant ($P < 0.001$) (57).

A prospective case-control study between February 2001 and October 2002. The study was among old age women in Lithuania showed that housewife women were at a high increased risk of LBW infants (p <0.001) (52).

An institution-based case-control study was conducted between April and December 2016 in Bale South-East Ethiopia showed that women who were merchants were 90 % less likely to have low birth weight babies (56). Similarly, An institution-based cross-sectional study was conducted

in the Kambata-Tembaro zone, southern Ethiopia in 2018 showed that the odds of having a low birth weight baby in the family are if the mothers who had housewife 5.4 times more likely to have low birth weight babies[AOR=5.4; 95% CI: 1.7-17.4](59).

In a retrospective community-based, cross-sectional study done in India in 2010, fathers who had unemployed were 1.29 times more likely to have low birth weight babies as compared to employed (95% C.L 1.29-3) (43). Other studies conducted in India and bale southeast Ethiopia showed that Husband's occupation was a statistically significant association with a low birth infant. (56, 57)

A cross-sectional study and the study period was between May 2007 to March 2008 at the Seremban General Hospital in Sembilan, Malaysia among old age women showed that, mothers with lower-income (RM <500) were 0.83: (95% CI 0.71 – 0.97) times more likely risk of LBW babies (55).

A facility-based cross-sectional study done in Gonder, North West Ethiopia showed that among women whose monthly income of fewer than 70 USD were 2.6 (AOR=2. 6 (95% CI=1. 16-6.05) times high risk of LBW infants than those who had greater than 175 USD (40). An unmatched case-control study was conducted between Jan and Mar 2017 in three public hospitals in North Shewa zone, Central Ethiopia showed that lower-income was associated with low birth weight infants (54). Studies of different countries showed that lower-income was associated with low birth weight infants (7, 52, 60). Another study showed that a significant association was not seen between the family income and LBW infants. (43)

An institution-based cross-sectional study was conducted in the Kambata-Tembaro zone, southern Ethiopia in 2018 showed that a significant association was seen between the low birth weight of newborns and family size ($P < 0.005$) (59).

2.3.2 Maternal related factors for low birth weight among old age woman

2.3.2.1 Maternal anthropometric and reproductive factors for low birth weight

A retrospective community-based cross-sectional study conducted in India in 2010, showed that the maternal height of 145 cm or less was a high risk for delivering low birth weight infants (43).

The institution-based case-control study design was conducted between April and December 2016 in North Wollo zone, Ethiopia showed that Mothers who weighed less than 50 kilograms were 4 times (AOR: 4.04; 95% CI 1.50, 10.84) at high risk to have low birth weight infants (58).

A multicenter, cross-sectional study done in 359 health facilities in 29 countries from Africa, Asia, Latin America, and the Middle East from May 2010 to 31 December 2011 showed that women who were less than 37 weeks gestational age were significantly associated with delivering low birth weight infants OR1.2, 1.4, and 1.3 for a woman aged 35-39, 40-45, and ≥ 45years old, respectively)(34). In a retrospective study conducted in Japan in 2011 Women with Preterm birth were at a 9.00 (AOR=9.00; 95% CI=6.06–13.38) times more likely to deliver an LBW infant compared to term birth (42).

A Cross-sectional study done in Southeast Iran between March 2014 and March 2015 showed that women who were less than 37 GWD were 22 (AOR= 22.1; (95% CI 20.46 – 23.80) times more likely the risk to delivering an LBW infant compared to above 37 GWD (45). A facility-based cross-sectional study done in Nigeria in 2011 showed that women who were less than 37 weeks gestation had 94.1% of their babies in the LBW (53).

A retrospective comparative study conducted in South Africa between September and November 2010 shows that older age women who gave birth before 37 weeks gestational age high risk to have low birth weight infants compared to mothers whose gestational age more than or equal to 37 weeks (35). A retrospective cohort study conducted in Cameroon showed that Women with Preterm birth were more likely to have low birth weight infants compared to mothers with term birth (36).

A facility-based cross-sectional study done in Gonder, North West Ethiopia showed that mothers whose gestational age less than or equal to 36 weeks were 18 times (AOR=18. 2. 95%CI=9.26-35.94) high risk to have low birth weight infants (40). An institutional-based cross-sectional study in Debre Markos Referral Hospital, Ethiopia between June 2017 and August 2017, showed that, women those who gave birth before 37 weeks gestational age 14.14 times (AOR=14.14, 95% CI= 5.838, 34.24) more likely to have low birth weight infants than counterparts(61).

A retrospective community-based cross-sectional study conducted in India showed that Low birth weight babies were 54.8% and 23.4% for women who had 3 or more children and women

who had one child respectively (43). Conversely, A retrospective study conducted in Japan in 2011 showed that women who had one child were 57% high risk of delivering an LBW baby (42).

A systematic review and meta-analysis were conducted for 44 studies showed that the prevalence of low birth weight was high risk in advanced maternal age nulliparous women (OR 2.28; 95%CI 1.25–4.13) (49)

a retrospective cohort study conducted in Cameroon, among mothers of age 40 years and over found that the higher the parity of women the higher the risk they are to delivered low birth weight baby as compared to a mother with lower parity (35).

A longitudinal study conducted by the Ghana Statistical Service (GSS) in 2011from 2009 to 2011 suggested that women giving birth to children of low birth weight 35% among women who had two or more children are higher than those who had one child 28.1% (60).

An institution-based, retrospective, cross-sectional study was conducted between June 2015 and May 2017 in Addis Ababa, Ethiopia suggested that Nulliparous women had 0.23 (CI: 0.19, 0.38), they have less likelihood of having a low birth weight infant (50). An institution-based cross-sectional study was conducted in the Kambata-Tembaro zone, southern Ethiopia in 2018 showed that Mothers who had several births greater than three were nearly 1.5 times [AOR=1.5; 95%CI: 1.8-2.6] high risk of delivering LBW birth infants compare to counterparts (59).

The institution-based case-control study was conducted between April and December 2016 in the North Wollo zone, Ethiopia showed that Mothers who were in their first pregnancy were more likely to have low birth weight infants than 2 to 4 pregnancies (58).

2.3.2.2 Current pregnancy and pregnancy-related complication

Hospital-based cross-sectional study was done in Addis Ababa, Ethiopia showed that a woman who had TT vaccination was less at risk to have LBW babies (62).

A study from 2005 to 2008 in South Korea showed that a significant association was seen Between gestational diabetes mellitus and low birth weight infants (44). A Cross-sectional study done in the Southeast between March 2014 and March 2015 showed that gestational hypertension and diabetes mellitus were significantly associated with LBW (45).

A study conducted in Pakistan between July 2011 and Dec 2011 showed that gestational diabetes mellitus & gestational hypertension significantly greater in pregnant women aged 40 and above years have more likely to have LBW infants(33).

A chart review retrospective comparative cross-sectional study was conducted between November 2017 and December 2017 to assess the association of advanced maternal age pregnancy with adverse obstetrical and perinatal outcomes in Mekelle Ayder Comprehensive Specialized Hospital, Northern, Ethiopia showed that pregnancy-induced hypertension in which advanced age mothers were four times (OR 4.15, (95% CI 2.272–7.575) more likely to deliver low birth weight baby compare who didn't hypertension (51). Studies from different countries showed that a woman who has a medical problem especially hypertension during pregnancy have more likely to deliver a low birth weight baby(29), (31), (35), (40).

In a retrospective community-based cross-sectional study done in India in 2010, a pregnant woman who initiated ANC later during pregnancy more proportion of low birth weight infants (48.4%) compared to those mothers who attended ANC early (15.1%) (43).

A facility-based cross-sectional study was carried out in the city of Ibadan, the capital of Oyo State, Nigeria in 2011 showed that Women who attended ANC in the later trimester of pregnancy had 26.7% of their infants in the low birth weight compared to about 20% and 9% of mothers who attended ANC in the second and first trimester. (53)

A longitudinal study conducted by the Ghana Statistical Service (GSS) in 2011 to from 2009 to 2011 suggested that Women who receive ANC even once tend to 25.0% give birth less likely to low birth weight babies than those who receive no antenatal services 38.1% (60).

A hospital-based cross-sectional study done between April and May 2015 in Addis Ababa, Ethiopia showed that Mothers who taken first ANC in the third trimester were seven times [AOR= 7.41,95% CI:1.15, 47.79] more likely to delivered low birth infants infant than those mothers who taken first ANC at first trimester (62). On the other hand, a cross-sectional study conducted in Jimma, Ethiopia between June 1999 and July 2000 showed that women who began ANC in the third trimester and second trimester 57.1% and 31.3%

respectively have the maximum number of low birth weight infants than the least 11.6% was among those mothers who began ANC in first trimesters pregnancy (39). Similarly, Unmatched case-control study was conducted between Jan and Mar 2017 in three public hospitals in North Shewa zone, Central Ethiopia showed that mothers who were not ANC visits had three times more likely to have low birth weight baby than who booked ANC visit (54). An institution-based cross-sectional study was conducted in the Kambata-Tembaro zone, southern Ethiopia in 2018 showed that the mothers who didn't attend antenatal care follow up during pregnancy were two times [AOR=2.3; 95%CI: 1.3-2.7] increased odds of giving to LBW baby. as compared to mother (59).

A retrospective community-based cross-sectional study done in India in 2010, showed that the number of ANC was greater or equal to four the prevalence was 25% of low birth weight than the number of visits less than four36.3%. Similarly, A case-control study was done from January to July 2014 in India showed that Mothers who had four and above ANC visits were less likely to have LBW infants than those who had visit four and more visits (43), (57).

A hospital-based cross-sectional study was conducted in Addis Ababa, Ethiopia showed that four or above ANC visit was less likely to give low birth weight baby (62).

The institution-based case-control study was conducted in Bale South-East Ethiopia showed that mothers who gave birth with birth interval three years and above were less likely to give low birth weight babies than those who have less or equal to two years (56). Similarly, An institution-based cross-sectional study was conducted in the Kambata-Tembaro zone, southern Ethiopia showed that mother who gave birth with birth interval less or equal to two years was 1.9 times [AOR=1.9; 95%CI: 1.6-3.6] more likely to give low birth weight babies than those who have three years and above (59).

A case-control study was done in India showed that Mothers of 25% low birth weight babies had a previous history of low birth weight babies LBW (57). On the other hand, a Hospital-based cross-sectional study was conducted in Addis Ababa, Ethiopia showed that a woman with a history of a small baby was at high risk of having a low birth weight infant (62).

A Hospital-based cross-sectional study done in Addis Ababa Ethiopia in 2015 showed that a woman with planned pregnancy was three times (AOR=0.30, 95% CI: 0.09) less likely to have low birth weight infants than a mother with unintended pregnancy (62). An institution-based cross-sectional study was conducted in the Kambata-Tembaro zone, southern Ethiopia in 2018 showed that mothers who have had unplanned pregnancies were two times [AOR=2.0;95%CI:1.2-3.8]more likely to have low birth weighted babies as compared to a woman with a planned pregnancy. (59)

A case-control study was conducted in India showed that pregnant Mothers of most of the low birth weight infants had a maternal weight increasing less than seven kilograms (59). A retrospective study conducted in Japan in 2017 suggested that pregnant women aged 40 years and above were an average weight gain of below seven kilograms were 2.76 high risks of having low birth weight babies (42).

An institutional-based cross-sectional study conducted in Debre Markos Referral Hospital, Ethiopia showed that whose maternal average weight gain of below five kg have 3.887 times more likely to give low birth weight (63).

Similar studies conducted in different countries showed that a woman with a history of APH during pregnancy were more likely to give birth to a low birth weight infant (31, 33, 35, 39, 44, 62).

Different studies showed that mothers who had a previous abortion history had a significantly higher risk for delivering low birth weight babies (7), (29), (31, 33), (44)

Magnitude and factors associated with low birth weight among women a Hospital-based cross-sectional study in Addis Ababa Ethiopia in 2015 showed that a woman with a stillbirth history was at high risk to have a low birth weight infant (62).

A retrospective community-based cross-sectional study done in India showed that a pregnant woman with a hemoglobin level less than 11 g/dl during pregnancy was significantly associated with LBW infants (43). Similarly, A case-control study was conducted in India showed that pregnant woman anemia during pregnancy was significantly associated with LBW babies (57). Similarly, A Cross-sectional study conducted in Southeast Iran between March 2014 and March

2015 showed that pregnant women's anemia during pregnancy was significantly associated with low birth weight babies (45).

Different studies found that mother's different reproductive histories and pregnancy-related complications have an association with low birth weight. reproductive risk factors that relate to low birth weight infants are preterm birth, anemia, inadequately attending antenatal care, prim parity, multiparty, previous history abortion, small birth interval, a maternal medical problem during pregnancy (Gestational diabetes and hypertension). Past obstetric factors that are found to have an association with low birth weight infants involve having prior low birth weight, previous history of stillbirth.

2.3.2.3 Maternal nutrition-related factors

A case-control study was done from January to July 2014 in India showed that mothers with no history of iron/folic acid tablets were at 8.82 times high risk to give low birth weight neonates (57).

A facility-based cross-sectional study conducted in Nigeria in 2011 showed that women who did not use an iron/folic acid tablets supplement were at high risk to have low birth weight infants (53).

A study done in India showed that women who intake a hundred or more iron-folic acid tablets during their pregnancies delivered less than 21.3%, low birth weight babies compared to women who intake less than a hundred iron-folic acid tablets37.8% (43).

An institutional-based cross-sectional study conducted in Debre Markos Referral Hospital, Ethiopia, showed that pregnant women who have consumed iron tablets for sixty or fewer days were significantly associated with LBW babies than a pregnant woman who consumed iron tablets for more than sixty days (61).

The institution-based case-control study was conducted in Bale South-East Ethiopia showed that Mothers who did consume de-worming tablets during pregnancy were less likely to have a low birth weight infant compare to Mothers who did not consume de-worming tablets (56).

An unmatched case-control study was conducted from Jan to Mar 2017 in North Shewa zone, Central Ethiopia showed that women who have a history of nutrition counseling during

pregnancy had less risk of delivering low birth weight infants compared to those who have not counseled (54).

A Hospital-based cross-sectional study was conducted in Addis Ababa, Ethiopia in 2015 showed that pregnant women who have access to additional diet were two times (AOR=0.25, 95% CI: 0.06, 0.96)) less probable to have low birth weight baby (62).

A health facility-based case-control study was conducted in Dassie town, Northeast Ethiopia showed that pregnant women who had inadequate dietary diversity had about seven times [AOR = 6.65: CI(2.31, 19.16)] more likely to have low birth weight infants than pregnant women with adequate dietary diversity (64).

A Retrospective Cohort Study was done in China among old age women showed that BMI higher than thirty kg/m2 during pregnancy was high risks to have LBW babies (65). Conversely, A retrospective study conducted in Japan showed that maternal BMI lower than 18.50 kg/m2 during pregnancy was associated with a high risk of delivering low birth weight babies (42).
A Study done in Bale South East Ethiopia showed that, maternal BMI lower than 18.50 kg/m2 seven times(AOR=6.7; 95 % CI=(1.21–37.14) more likely to have low birth weight babies (56).

A facility-based cross-sectional study done in North West Ethiopia in Bahir Dar Felge- Hiwot Referral Hospital showed that, Mothers who had MUAC less than 23 cm were 3.4 times [(AOR 3.4(95% CI: 1.38-8.60) more likely to have LBW infants than to mothers whose MUAC were greater than or equal to 23 cm. (40). On the other hand, an Unmatched case-control study conducted in three public hospitals in North Shewa zone, Central Ethiopia showed that the risk of giving LBW baby was high among pregnant women who had MUAC less than 23 cm than to women with MUAC greater than 23 cm(54)

2.3.2.4 Maternal Behavior factors

A retrospective community-based cross-sectional study done in India showed that smoking during pregnancy was a high risk of delivering LBW infants than non-smoking mothers (43).

A study done in Switzerland showed that infants whose mothers smoked during pregnancy were at high risk to have LBW babies and the risk higher with the number of cigarettes smoked daily. Similarly, women smoking more than twenty cigarettes per day more likely to have low birth

weight babies than a woman smoking 1–9 cigarettes per day (66). A different study showed that infants whose mothers smoked during pregnancy were more likely to be low birth weight infants compared to infants with non-smoking mothers (46, 52).

An institution-based case-control study was conducted in Bale South-East Ethiopia showed that chat chewing during pregnancy was six times (AOR=6.4; 95 % CI =2.41–17.10) more likely the risk of LBW babies (56).

An Institutional based cross-sectional study done in Axum, Tigray, North Ethiopia showed that infants whose mothers drink alcohol during current pregnancy were 6.4 times AOR 6.4 (CI 1.235–33.9 more likely to have low birth weight infant (67).

Another study was done in Bale, South East Ethiopia, and Addis Ababa Ethiopia showed that a history of alcohol drinking was not statistically associated with low birth weight. (56)

Even if many studies are done on low birth weight in Ethiopia which addresses the prevalence, socioeconomic and maternal medical, and obstetric risk factors a study on the risk of old age woman with low birth weight is relatively limited. So this study will try to assess the prevalence of LBW born to older women and its risk factors in Addis Ababa. In addition, health care workers to emphasize on how to improve advanced age mothers' health.

2.4. Conceptual framework

The conceptual framework was developed based on the reviewed literature (62, 68). It shows that the independent variables with the solid line that influence low birth weight are categorized into four groups as socio-demographic/socio-economic factors, reproductive factors, nutritional factors, and behavioral factors. The broken line shows the assumption that one independent variable may affect the other independent variable of the study. For this particular study the dependent variable low birth weight

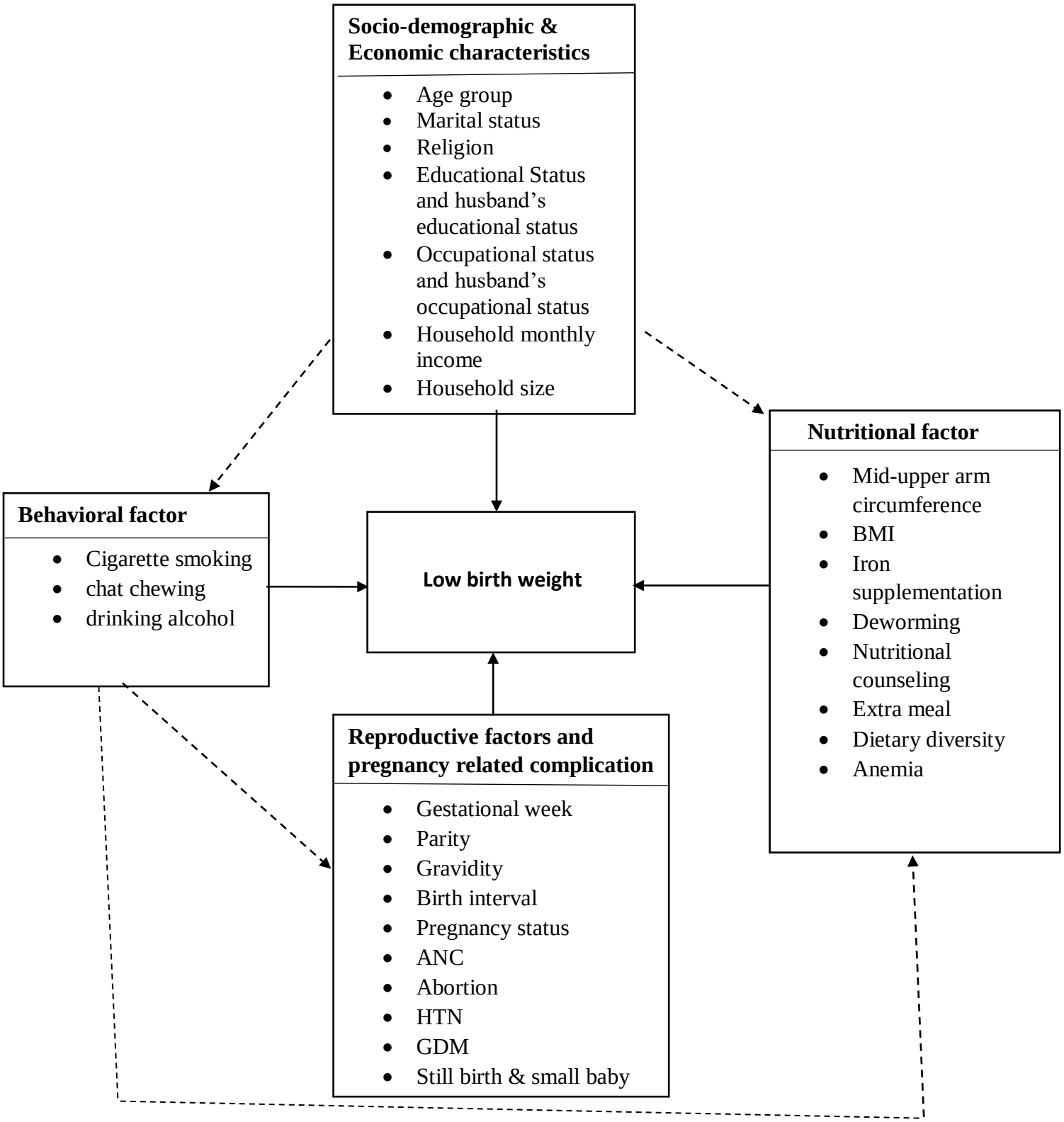

Figure 1. Conceptual frameworks developed based on findings from different literatures

3: OBJECTIVE

3.1. General objective

To assess the prevalence of LBW born to elder women and its risk factors in Addis Ababa, Ethiopia 2020

3.2. Specific objective

- To determine the magnitude of low birth weight among newborns born to elder women in public health facilities in Addis Ababa, Ethiopia.
- To examine factors associated with low birth weight among newborns born to elder women who delivered in public health facilities in Addis Ababa, Ethiopia.

4. METHODS

4.1. Study area

The study was conducted in Addis Ababa which is the capital city of Ethiopia with an estimated area of 540 square kilometers. The city lies between 2000-3000 meters above sea level, has annual temperatures that range from 10℃ and 25℃ and, have an annual rainfall of about 1200mm. The city has an estimated population of 5,006,000 (69). Among this 31 % of women are of reproductive age (15-49) and17% are older women aged 35 years and above (70).

In the city, their are11 Sub-city health departments that are directly accountable to their respective Sub cities administrations. There are also 67 hospitals (12public and 45 private), 119 health centers, and 892 clinics. According to the Addis Ababa health bureau administrative report, the number of children born in recent years was 104,553. The proportion of low birth weight among reproductive group age women (15-49) is 11.4% (38), (70).

4.2. Study design and study period

A quantitative institution based cross-sectional study was carried out from Oct 2019 to Dec 2020, in Addis Ababa, Ethiopia.

4.3. Population

4.3.1. Source of population

The source population is elder women who give a newborn to a child in Addis Ababa.

4.3.2. Study population

The study population is mothers in the age group of 35-49 who give birth to the child in public health facilities of Addis Ababa during the study period.

4.4. Eligibility criteria

4.4.1. Inclusion criteria

- Mothers aged 35-49 years of age who delivers babies in public health facilities during the study period.

4.4.2. Exclusion criteria

- A mother who delivers babies in public health facilities but are critically ill and unable to responds to our questioner during the study period and those mothers who give birth to twins.

Besides, mothers who have difficulty in communication and those who give birth a baby with grossly visible congenital anomaly were excluded from the study.

4.5. Sample size determination and sampling procedure

4.5.1. Sample size determination

The sample size for this study was determined by using a formula for a single population proportion with the following assumption. A 95% confidence level, a 5% margin of error, and since the prevalence of LBW among elder women in Ethiopia is not found from a previous study, we consider a 50% prevalence to boost the power of the study.

$\alpha = 5\%$

$n = z^2pq/d2$

Assumption

n= number of sample size

Z= confidence interval (CI) =95%=1.96

P= population proportion there is no study on low birth weight among children born to an older woman in Addis Ababa. Therefore p=0 .5

q=1-p; q=1.0-0.5=0.5

w= level of precision (margin of sample error tolerated) =5%=0.05

$= (1.96)^2(0.5)\ (0.5)/ +10\% = 384$

$(0.05)^2$

So, n= 384

The minimum sample size calculated is 384 and it has a designing effect of 1.5 so, the sample size is multiplied by 1.5 n= 576 and adding the considered non-response rate of 10%. The main reason for considering the design effect is because there is the heterogeneity of the study population by different socio-economic statuses.

So, n= 576+10%= 633. The total sample size is 633.

4.5.2. Sampling procedure

A multi-stage sampling procedure was employed according to the Addis Ababa health bureau administrative report from the previous calendar year 44% of newborns were born in a health center in Addis Ababa. Therefore 44% of the study population was selected from health centers and reaming 56% from the hospital. There are 11 sub-cities in Addis Ababa among which 5 were selected for this study randomly. In each sub-city one health center was selected randomly. In each selected health center old age women who delivered in the selected health center were systematically selected. The systematic selection was considered based on the caseload from the previous calendar year. Sampling was proportionately allocated to the health center (figure 2).

In the case of hospitals, there are 12 hospitals among which 3 hospitals in the city were randomly chosen. In each selected hospital the sample was proportionately allocated. Then from each share of the hospital woman was systematically selected (figure 2).

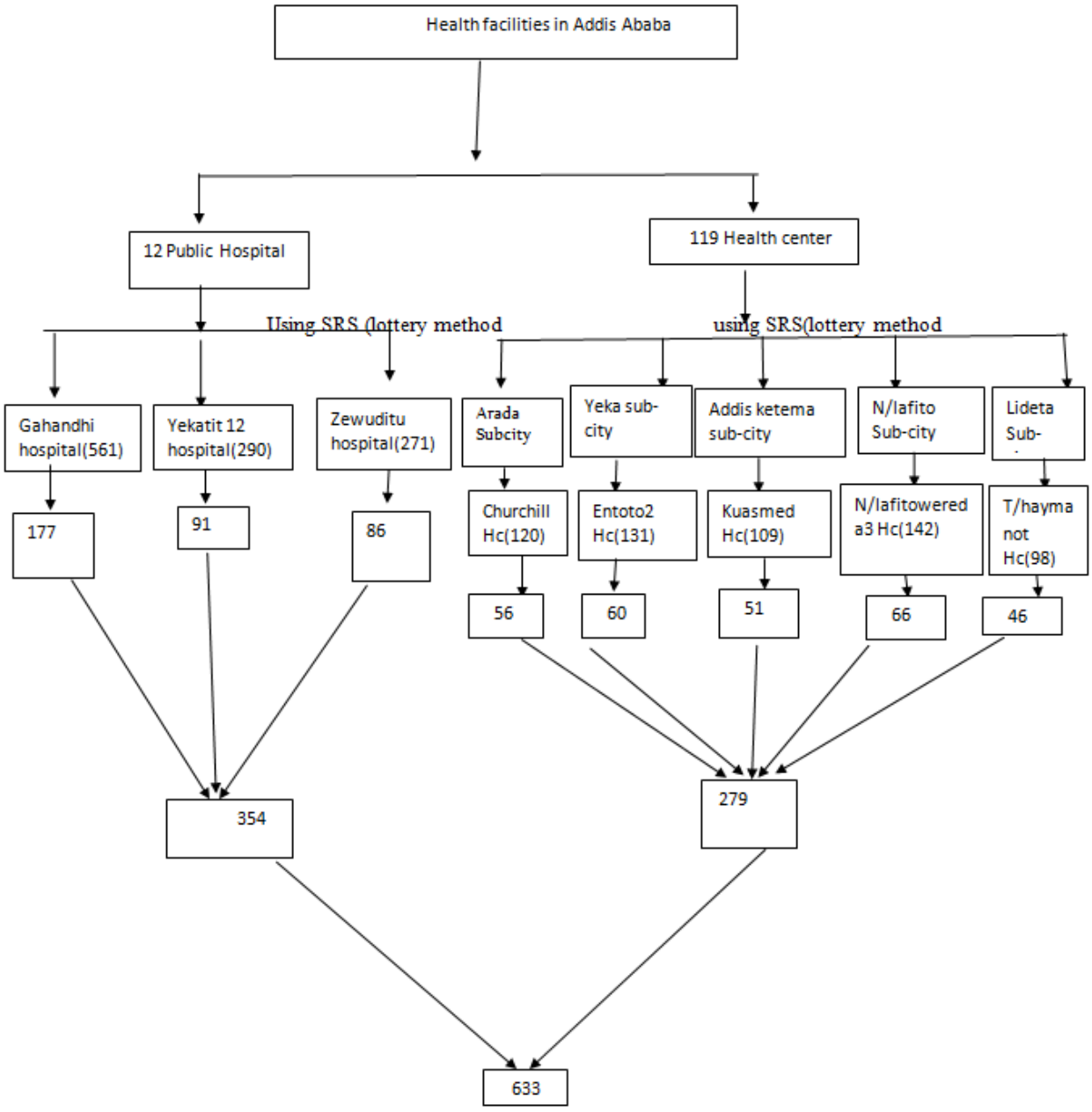

Figure 2. Schematic presentation of the sampling procedure to select Study Participant, Addis Ababa Ethiopia

4.6 Measurement

4.6.1 Birth weight: Outcome variable

The birth weight of the newborns was taken within 1 hr after delivery with naked weight by data collectors using a standard baby weighing scale graded in 100 grams. Low birth weight was those newborns weighed less than 2500g while those newborns with a birth weight of 2500g and above up to 3999 was considered as normal weight. The scales were always checked daily and between measurements to adjust at zero levels before weighing each newborn.

4.6.2 Exposure variable

- Socio-demographic and economic factors: (Age group, marital status, religion, education of the mother & husband, income, occupation of the mother and husband, family members)
- Maternal and reproductive factors for low birth weight: maternal Height was measured using a height board while the mother was in a standing position. Each height was taken to the nearest 0.1 cm. Mothers were asked to stand without shoes in front of the height board, with the head erect and the arms hanging naturally at the sides. And the maternal weight was measured using a weight scale place on a flat, level surface and check and readjust the weight reading to zero. Each weight was taken to the nearest 100g and stands freely without holding onto anything, parity, Gravidity, GA at birth (Gestational age was taken from Ultrasound result at the third trimester). The gestational age was used to classify preterm and term birth, ANC, number of ANC follow up, birth/pregnancy interval, history of small baby, type of pregnancy, pregnancy-related complication (HTN, GDM), The HTN and GDM each mother was taken from her health card as is routinely done blood pressure and blood glucose level for each mother and register on a card whether the mother diagnosed HTN or GDM. anemia (the hemoglobin level of each mother was taken from her health card as hemoglobin is routinely done for each mother receiving delivery services in each public health facility. history of abortion, history of stillbirth and
- Nutritional factors: extra diet, nutritional counseling, Dietary Assessment The minimum dietary diversity for women (MDD-W) was collected using the 24-h recall method by using the MDD-W tool(71). Briefly, the women were asked to recall the foods they had consumed in the previous 24 h, first spontaneously followed by probes to ascertain that

no meal or snack was left out. The foods were then categorized into 10 food groups. Then, a woman was assigned in the adequate dietary diversity group if her MDD-W ≥ 5 food groups or in the inadequate group if her MDD-W < 5 food groups. The mid-upper arm circumference (MUAC). The circumference was measured at the mid-point between the tip of the acromion process of the scapula and the olecranon process of the ulna. BMI (calculated by kg/m^2 where kg is a person's weight in kilograms and their height in meters squared), iron/folic acid supplementation, number of day iron/folic acid take, (iron/folic acid supplementation how many times did the mother receive iron during pregnancy were asked for each mother), TT vaccination, and deworming (did the mother receive TT vaccination and deworming during pregnancy were asked for each mother)

- Maternal behavior (cigarette smoking, drinking alcohol, and chat chewing)

  First, the woman was asked a question to assess whether or not she smoked a cigarette during the current pregnancy. If she responded "yes" and a number of cigarettes at times and the number of days cigarettes smoked per 30 days.

  The participants were asked to report their alcohol consumption during pregnancy. If the women responded "yes", then a number of alcohol drinking per 30 days

  The woman was asked whether or not chewed khat during the current pregnancy. If the women responded "yes", then a number of chat chewed per 30 days

4.7 Data collection

Data were collected using an interviewer-administered structured questionnaire. The questionnaire was prepared by referring to relevant literature and by adopting a similar questionnaire used earlier (38, 62, 72). Medical records were cross-checked to confirm important variables such as Hemoglobin level and gestational age. The questionnaires were first translated to Amharic and then back to English for checking consistency. The questionnaire includes data on socio-demographic and economic characteristics, reproductive characteristics, and maternal behavior. The questionnaire was pre-tested in health facilities outside the study area (Minilk hospital); this allowed for the clarification and modification of questions to better suit the study population. Three Diploma midwife nurses and one Health officer participated as data collectors and supervisor respectively.

4.8. Operational definitions

- **Low birth weight**- low birth weight is defined as a newborn with bodyweight at the birth of fewer than 2500 grams.
- **Term baby**- a baby delivered between 37 weeks to 42 weeks.
- **Preterm**-a baby delved before 37 completed weeks.
- **Very low birth weight (VLBW)** is a birth weight < 1500g regardless of gestational age
- **Prim parous**- giving or having given birth for the first time.
- **Multiparous**- Having one or more previous children.
- **Stillbirth** – a baby born dead after 28 completed week of pregnancy
- **Abortion**- a fetus born before 28 weeks of gestation

4.9. Quality assurance

One day training was given for the data collectors and supervisor by the principal investigator on the sampling procedure, a technique of approaching the participants during the interview, the inclusion and exclusion criteria, on how to use the tool, and how to keep confidentiality and the right of the respondent not to participate in the interview. This was complemented with practical role-plays. The questionnaire was prepared in English and translated to Amharic by a translator and the second translator was translate back to English to keep the consistency of the questions. The questionnaire was pre-tested, on (5% of the sample size) mothers, to assess for its completeness, clarity, length, and skip patterns, for suitability before 10 days of data collection in another health facility that had no chance of being included in this study and the data did not include in the study. Then, appropriate amendments were done to the questionnaire based on the feedback from the pretest, and further briefing was given to the data collectors and supervisor as part of the training. Field supervisors perform the immediate supervision of data collection procedures daily. The other mechanism is performing data entry using software by principal investigators and designing a data entry template with internal consistency check schemes.

4.10. Data Analysis

The data was entered in EPI Data version 3.1 then the data was edited, cleaned, and analyzed by using STATA for Windows version 15. Data cleaning was done in STATA version 15 by running each variable's frequency and cross-tabulation to check missed variables. Summary measurers were presented using frequency distribution tables and graphical presentation. The continuous variable (birth weight) was summarized using mean, median value, and proportion. Moreover, the overall association between low birth weight and the independent variable was seen by cross-tabulation, and the statistical significance was tested using Chi-square.

Also, the binary logistic regression model was used to determine the association between different factors and low birth weight. The independent variables (socio-demographic and economic, reproductive characteristic, nutritional characteristics, and Maternal behavior) that showed significant association to low birth weight in the bivariate logistic regression analysis which (have p value<0.05) were entered in multiple logistic regressions analysis.

Finally, Multivariate logistic regression was applied to variables that were found to be significant on the bivariate model. Adjusted Odds ratio along with their 95% confidence interval was used to measure the strength, direction, and significance of the association between the different independent variables and low birth weight. The level of significance was decided when $p < 0.05$.

4.11. Ethical considerations

The study protocol was reviewed by the ethical review committee of the School of Public Health in Addis Ababa University and Ethical clearance was obtained from the Research Ethical Clearance Committee of the School of Public Health in Addis Ababa University. Following this each study health facility was informed on the study aim and objective and study permission was obtained. Then the purpose, benefit, and possible harm of the study were explained to the respective institutions and respondents before starting the data collection. Doesn't have direct benefit or payment to the study participant but participation likely helps us to meet the research objective. Ultimately, this will help us to improve service for caregivers and the community as a whole. Participants were informed that participating in this study is purely voluntary and from each selected participant consent was taken to confirm their willingness. Informed verbal consent was also obtained from individual participants. Respondents were affirmed that they are free to withdraw their consent and to discontinue participation in the study if they want to do so. In addition to the study participant, written permission was obtained from the health bureau of the Addis Ababa city government. Consent was also obtained from medical directors and respective unit heads at each health institution. The participants were assured that the information which they will give will be used only for the study. Names and other identifying characteristics of respondents were not written on the questionnaire and the confidentiality was kept and no one except the research team members has access to the raw data.

4.12. Dissemination of results

The results of the study will be communicated and submitted to the concerned public health institution. Similarly, copies of the research report will also be submitted to Addis Ababa University, College of Health Sciences and School of Public Health, and other concerned organizations. The result will be presented during the thesis defense, as partial fulfillment for a master of public health. The effort will be made to publish in peer-reviewed journals.

5. RESULT

5.1 Socio-Demographic & Economic Characteristics

A total of 625 respondents with a response rate of 98.7% participated in this study. The majority of the respondents 553 (88.5%) were in the age group of 35-39 years with the mean age of 37 (± 2.0 SD) years. six hundred eleven (97.76%) of women were currently married and a great majority 375(60.0%) were Orthodox, 128(20.48%) were protestant and 122(19.52%) were Muslim religion followers. The majority of study participants at least secondary education 482(77.12%) and 454(74.3) their partner at least secondary education. Regarding their occupational status of women 393(62.88%) were housewives followed by 94 (14.56%) who were government employees whereas 141(22.56%) were from another occupation. Likewise, the occupational status of the husband majority was 373(60.05) self-employee. The majority of four hundred sixteen (66.56%) households had a family size of 1-3 persons and 184(46%) households had a family size of greater than or equal to four persons in their families. About 242(38.72%) of the respondents earned high income (more than 5,001 Birr) monthly and 159(25.44%) earned low income (less than 3001).

Table 1. The distribution of newborn by maternal socio-demographic & Economic characteristics in public health facilities of Addis Ababa, Ethiopia, 2020

Variable	Frequency	Percent
Age group of mothers (year)		
35-39	553	88.48
40-43	72	11.52
Marital status		
Single	14	2.24
Married	611	97.76
Religion		
Orthodox	375	60.0
Protestant	128	20.48
Muslim	122	19.52
Educational status		
Illiterate and Primary education(1-8)	186	29.76
Secondary education(9-12)	296	47.36
Diploma and above	143	22.88
Husband Educational status		
Illiterate and Primary education(1-8)	133	21.77
Secondary education(9-12)	321	52.54
Diploma and above	157	25.70
Occupation		
Housewife	393	62.88
Govt employee	91	14.56
Private employee/NGO employee	30	4.80
Self-employee	93	14.88
Others	18	2.88
Husband Occupational status		
Govt employee	96	15.71
Private employee/NGO employee	70	11.46
Self-employee	373	61.05
Others	72	11.78
Household family size		
1-3 child	416	66.56
>= 4child	209	33.44
Average monthly income		
<=3000	159	25.44
3001-5000	224	35.84
>=5001	242	38.72

*other=student, merchant, farmer, daily laborer

5.2 Reproductive health characteristics and current pregnancy status

More than two-thirds of 468(75.12%) mothers delivered their neonates between 37-42 completed weeks of gestation. The mean gestational age at birth was 39 ± 4.15 weeks. Four hundred thirty-one (68.96%) mothers were more than one time become pregnant. Three hundred ninety-four (63.04%) Mothers spaced between the present and past pregnancy more than 2 years. The majority 573(91.68) of the respondent's recent pregnancies were planned; while the rest 52(8.32%) were unplanned pregnancies. Five hundred forty sex (88.2%) of participants had four and above ANC visits and more than two-third 440 (71.1%) mothers start ANC during the first three months of pregnancy. Six hundred eleven (97.8%) mothers have TT vaccination during or before the current pregnancy. 507(81.12%) of the mother had not developed pregnancy-induced hypertension; while the rest 118(18.9%) of the mothers had developed pregnancy-induced hypertension. Two hundred seventy-six (17.5%) mothers had no history of abortion; while the rest 155(34.9%) mothers had a history of abortion. 29(6.7%) of mothers had a history of stillbirth.

Table 2. The distribution of newborn by maternal Reproductive health characteristics and current pregnancy status in public health facilities of Addis Ababa, Ethiopia, 2020

Variable	Frequency	Percent
Gestational week:		
<37 weeks of gestation	101	16.21
37-41 weeks of gestation	468	75.12
>=42 weeks of gestation	54	8.67
Gravidity:		
Prime- Gravida	194	31.04
more than 2 times pregnant	431	68.96
Parity:		
Prime-parity	273	43.68
2 child and more	352	56.32
Birth interval in year :		
<=2	231	36.96
>2	394	63.04
Current pregnancy status:		
Planned	573	91.68
Unplanned	52	8.32
Number of ANC		
No ANC	6	0.96
1-3 visits	73	11.68
>=4 visits	546	87.36
Time of first ANC		
In the first 3 months	440	70.40
>=4 months	185	29.60
TT vaccine before or during pregnancy		
Yes	611	97.76
No	14	2.24
History of abortion		
Yes	155	35.96
No	276	64.04
Pregnancy-induced hypertension		
Yes	118	18.88
No	507	81.12
History of stillbirth:		
Yes	29	6.73
No	402	93.27

5.3 Nutritional status and anthropometric characteristics

The majority of study participants were weight greater than 50kg 611(97.76%) and maternal height greater than 150cm 616(98.56%). The majority of 571(91.36%) mothers had muac of greater than 22 cm. Half 313(50.1%) of mothers had a BMI of 25–29.9 kg/m2. More than half 325(52%) study participants were taken iron tablets for more than 90 days. Four hundred fifty (66.40%) mothers have not deworming during pregnancy. 539(55.4%) of mothers reported that they were provided with dietary counseling during the current pregnancy and 529(86.64%) were take extra meal during the current pregnancy. Five hundred thirty (84.80) had 4 or more times to eat per day during the recent pregnancy. The largest proportion of mothers, 578(92.5%) had inadequate MDD-W. Six hundred one (96.16%) of the respondents had not developed anima during their current pregnancy.

Table 3. The distribution of newborn by maternal Nutritional and anthropometric characteristics in public health facilities of Addis Ababa, Ethiopia, 2020

Variable	Frequency	Percent
Weight of the mother(kg):		
<=50	14	2.24
>=51	611	97.76
Height the mother(cm):		
<=150	9	1.44
>=151	616	98.56
MUAC(cm):		
< 23	54	8.64
23- 25	207	33.12
> 25	364	58.24
BMI (kg/m2)		
18.5-24.9	295	47.28
25-29.9	313	50.16
>=30	16	2.56
Iron supplementation		
No	12	1.92
<=90 day	288	46.08
>=91day	325	52.00
Deworming during pregnancy		
Yes	210	33.60
No	415	66.40
Nutritional counseling		
Yes	539	87.08
No	80	12.92
Extra meal during current pregnancy		
Yes	529	84.64
No	96	15.36
Frequency of meal per day		
<=3 times	95	15.20
>=4 times	530	84.80
MDD-W[a]		
Adequate	47	7.52
Inadequate	578	92.48
Anemia		
Yes	24	3.84
No	601	96.16

[a]MDD-W indicates minimum dietary diversity for women

5.4 Maternal behavior characteristics

Fifty (8.0%) mothers used alcohol like tella, beer, wine, areke during the current pregnancy. Of those mothers, 22(56%) did not drunk in the last 30 days, 11(22%) drank three days per month and 11(22%) drank four to seven days per month during pregnancy.

Table 4. The distribution of newborn by maternal behavioral characteristics in public health facilities of Addis Ababa, Ethiopia, 2020

Alcohol use during the current pregnancy		
Yes	50	8.00
No	575	92.00
Number of days alcohol drink in the last 30 days		
None in the last 30 days	28	56.00
<=3 days	11	22.00
4-7 days	11	22.00

5.5 Magnitude of LBW by socio-demographic & economic characteristics

Out of 625 respondents, 94 (15.04%) had low birth weight babies and 531 (84.96%) were normal birth weight babies (Figure 3). The mean birth weight of babies was 3012.8 (±597.27SD). The magnitude of LBW was 75(13.6%) among mothers in the age group 35-39 years of age and 19(26.4) among the mother's age group 40-43 years of age. Age group is statistically significant with LBW. The magnitude of LBW was 28(15.1%) among mothers who not attended formal education (no education) and primary education, 52(17.6%), and 14(9.8) among mothers who attended secondary level of education and diploma and above respectively. Educational status is not statistically significant with LBW, an overall decline is observed when maternal education increases. Regarding their occupational status of women, the magnitude of low birth weight was 57(17.5%) among mothers who were housewives, 13(14.3%), 9(25.7%), and 15(16.1%) among mothers who were Government employees, private employee/NGO employee and self-employed respectively. Occupational status is not statistically significant with LBW. The magnitude of LBW was 78(19.2%) among mothers who had a households family size of 1-3 persons and 16(7.3%) among mothers who had a family size of greater than or equal to four persons in their families. Household family size is statistically significant with LBW. The magnitude of LBW was 36(22.6%) among mothers who earned low income (less than 3,001 Birr) monthly and 46(20.5%) among mothers who earned between 3001-5000 birr and 12(4.96%) among mother who earned high income (more than 5,001 Birr). monthly income is statistically significant with LBW and an overall decline is observed when monthly income increases.

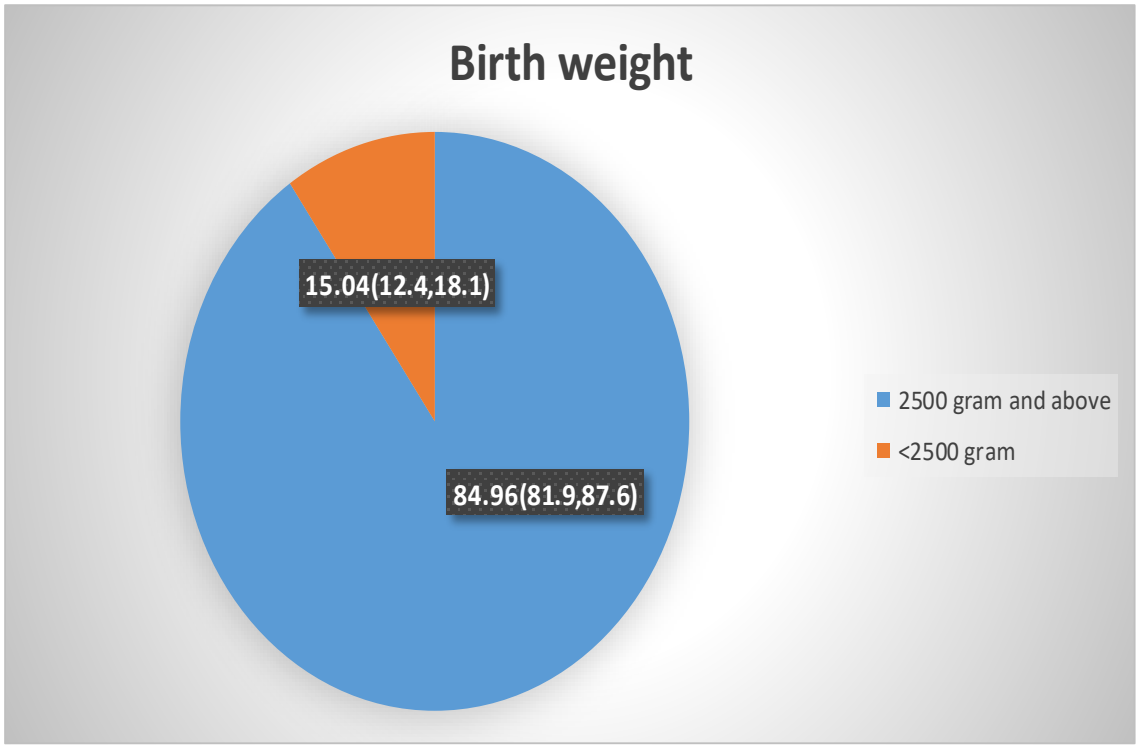

Figure 3: Birth weight of newborns delivered in Addis Ababa, Ethiopia, August, 2020e

Table 5. The magnitude of low birth weight among newborns in public health facilities of Addis Ababa by socio-demographic and economic characteristics, 2020

Variables	Low birth weight # (%)		(X^2) P-Value
	Yes (n=94) # (%)	No (n=531) # (%)	
Age group of mothers (year):			**(8.2)0.004**
35-39	75(13.5)	478 (86.5)	
40-43	19(26.4)	53 (73.6)	
Educational status			(7.6)0.106
Illiterate and Primary education(1-8)	28(15.1)	158 (84.9)	
Secondary education(9-12)	52(17.6)	244(82.4)	
Diploma and above	14(9.8)	129(90.2)	
Occupation			(2.6)0.632
Housewife	57(14.0)	336(85.5)	
Gov't employee	13(14.3)	78(85.7)	
Private employee/NGO employee	9(25.7)	26(74.3)	
Self-employee	10(16.1)	78(83.9)	
*Others	5(27.8)	13(72.2)	
Husband occupational status			(3.1)0.382
Gov't employee	9(9.4)	87(90.6)	
Private employee/NGO employee	12(17.1)	58(82.9)	
Self-employee	60(16.1)	313(83.9)	
*Others	10(13.9)	62(86.1)	
Household family size			**(36.4)0.000**
1-3 child	78(19.2)	328(80.8)	
>= 4child	16(7.3)	203(92.7)	
Average monthly income			**(25.7)0.000**
<=3000	36(22.6)	123(77.4)	
3001-5000	46(20.5)	178(79.5)	
>=5001	12(4.96)	82(95.04)	

*other=student, merchant, farmer, daily laborer

5.6 Magnitude of LBW by reproductive characteristics

The magnitude of low birth weight was 58(57.4%) and 34(7.3%) among mothers who delivered their neonates below 37 completed weeks of gestation (preterm) and between 37-41 weeks of gestation respectively and statistically significant with LBW. The magnitude of low birth weight was 52(26.8) among Prime- Gravida mothers, 42(9.7%) among two times become pregnant and more. Gravidity is statistically significant with LBW. The magnitude of low birth weight was 33(14.3) among mothers who spaced between the present and past pregnancy less than 2 years and 61(15.5) among mothers who spaced between the present and past pregnancy more than 2 years. The birth interval is not statistically significant with LBW. The magnitude of low birth weight was 87 (15.2%) among mothers recent pregnancies were planned and 7(13.7%) among mothers recent pregnancies were unplanned. Pregnancy status is not statistically significant with LBW. The magnitude of low birth weight was 14(19.2%) and 80(14.7%) among mothers who had less than four ANC visits and four and above ANC visits respectively. The number of ANC visit is not statistically significant with LBW. The magnitude of low birth weight was 73(16.6%) among mothers who start ANC during the first three months of pregnancy and 21(12%) among mothers who start ANC during the second and third trimester. The magnitude of low birth weight was 30(19.4%) among mothers who had a history of abortion but 11(3.9%) among mothers who had no history of abortion. The history of abortion is statistically significant with LBW. The magnitude of low birth weight was 62(52.5%) among mothers who develop pregnancy-induced hypertension and 32(6.3%) among mothers who had not develop pregnancy-induced hypertension. pregnancy-induced hypertension is statistically significant with LBW.

Table 6. The magnitude of low birth weight among newborns in public health facilities of Addis Ababa by reproductive characteristics of mothers, 2020

Variables	Low birth weight # (%)		(X^2) P-Value
	Yes (n=94) # (%)	No (n=531) # (%)	
Gestational week			**(154.2) 0.000**
<37 weeks of gestation	58(57.4)	43(42. 6)	
37-41 weeks of gestation	34(7.3)	434(92.7)	
Gravidity			**(30.5) 0.000**
Prime- Gravida	52(26.8)	142(73.2)	
more than 2 times pregnant	42(9.7)	389(90.3)	
Birth interval in year			(0.2) 0.686
<=2	33(14.3)	198(85.7)	
>2	61(15.5)	333(84.5)	
Current pregnancy status			(0.1) 0.739
Planned	87(15.2)	486(84.8)	
Unplanned	7(13.5)	45(86.5)	
Number of ANC			(1.0) 0.312
1-3 visits	14(19.2)	59(80.8)	
>=4 visits	80(14.7)	466(88.6)	
Time of first ANC			(2.8) 0.094
In the first 3 months	73(16.6)	367(83.4)	
>= 4 month	21(11.4)	164(88.6)	
History of abortion			**(27.2) 0.000**
Yes	30(19.4)	125(80.1)	
No	11(3.9)	265(96.4)	
Pregnancy-induced hypertension			**(160.1) 0.000**
Yes	60(51.7)	56(48.3)	
No	34(6.7)	475(93.3)	

5.7 Magnitude of LBW by nutritional characteristics

The magnitude of LBW was 34(62.9%), 34(16.4%), and 26(7.1%) among mothers who had muac of <23 cm, muac of 23-25, and muac of >25 cm respectively. Mid-upper arm circumference is statistically significant with LBW and an overall decline is observed when muac increases. The magnitude of LBW was 63(22.4%) among mothers who taken iron tablets 90 days and below 29(8.7%) among mothers who taken iron tablets greeter than 90 days during pregnancy. Iron supplementation is statistically significant with LBW. The magnitude of LBW was 29(13.8%) among mothers who deworming during pregnancy whereas. The magnitude of LBW was 80(14.8%) among mothers who reported that they were provided with dietary counseling during the current pregnancy but 14(17.7%) among mothers who reported that they were not provided with dietary counseling during the current pregnancy. Nutritional counseling is not statistically significant with LBW. The magnitude of LBW was 77(14.6%) among mothers who have an extra meal during the recent pregnancy but 17(17.7%) among mothers who have not extra meal during the recent pregnancy. The magnitude of LBW was 16(16.8%) among mothers who had 3 times or less eat per day and 78(14.7%) among mothers who had >=4 times eat per day during the current pregnancy. The frequency of meals per day is not statistically significant with LBW but an overall decline is observed when the Frequency of meals per day increases.

Table 7. The magnitude of low birth weight among newborns in public health facilities of Addis Ababa by Nutritional characteristics of mothers, 2020

Variables	Low birth weight # (%)		(X^2) P-Value
	Yes (n=94) # (%)	No (n=531) # (%)	
Mid-upper arm circumference			**(115.1)0.000**
< 23 cm	34(62.9)	20(37.1)	
23- 25 cm	34(16.4)	173(83.6)	
> 25cm	26(7.1)	338(92.9)	
Iron supplementation			**(22.3) 0.000**
<=90 day	63(22.4)	218(77.6)	
>=91day	29(8.7)	303(91.3)	
Deworming during pregnancy			0.4 (0.540)
Yes	29(13.8)	181(86.2)	
No	65(15.7)	350(84.3)	
Nutritional counseling			(0.38) 0.537
Yes	80(14.8)	459(85.2)	
No	14(17.5)	66(82.5)	
Extra meal during current pregnancy			(0.6) 0.427
Yes	77(14.6)	452(85.4)	
No	17(17.7)	79(82.3)	
Frequency of meal per day			(0.3) 0.594
<=3 times	16(16.8)	79(83.2)	
>=4 times	78(14.7)	452(85.3)	

5.8 Factors associated with low birth weight

The result showed that from the socio-demographic factors, monthly family income and age group of the mothers were significantly associated with LBW babies. Similarly, reproductive and nutrition characteristics of the mothers of the listed Mid-upper arm circumference, Gestational week, History of abortion and pregnancy induce hypertension were significantly associated with LBW babies.

Those mothers with the age range of 40-49 years were 3.16 times [AOR=3.16: 1.06, 9.46] more likely to give LBW babies as compared to those whose age range 35-39 years. Those mothers with monthly income less than 3001 birrs were four times[AOR=4.33:1.24, 15.19] more likely to give LBW baby as compared to mothers with a monthly income of greater than 3000 birrs. Mothers who had MUAC less than 23 cm were 4.49 times [AOR=4.49:1.26,16.02]more likely to have a low birth weight baby than mothers whose MUAC were greater than or equal to 23 cm. Those mothers who gave birth before 37 weeks gestational age (per term) were 6.87 times [AOR=6.87:2.76,17.07] more likely to have a low birth weight baby as compared to those mothers who gave birth at 37 weeks gestation or more. Mothers who had a previous abortion history had 4.22 times [AOR=4.22:1.45, 9.66] more likely to have low birth weighted babies compare to counterparts. Mothers who had pregnancy-induced hypertension were six times [AOR=5.80:2.23, 15.18] more likely to have low birth weight babies than those who did not pregnancy-induced hypertension during the current pregnancy.

Table 8. The association between different characteristics of newborns and their mother with low birth weight in public health facilities of Addis Ababa, 2020

Variables	Low birth weight # (%)		COD (95%CI)	AOR (95% CI)
	LBW (n=94) # (%)	NBW AND ABOVE (n=531) # (%)		
Age group of mothers(year)				
35-39	75(13.5)	478(86.4)	1	1
40-43	19(27.9)	53 (73.6)	**2.28(1.28,4.07) ***	**3.16(1.06,9.46) ****
Average monthly income				
<=3000	36(22.6)	123(77.4)	**5.60(2.82,11.17) ***	**4.33(1.24,15.19) ****
3001-5000	46(20.5)	178(79.5)	**4.95(2.55,9.63)**	2.97(0.52,9.52)
>=5001	12(4.96)	82(95.04)	1	1
Mid-upper arm circumference				
< 23 cm	34(62.9)	20(37.1)	**3.02(1.88,4.85) ***	**4.49(1.26,16.02) ****
23- 25 cm	34(16.4)	173(83.6)	1	1
> 25cm	26(7.1)	338(92.9)	0.39(0.23,0.67)	1.31(0.44,3.84**)**
Gestational week				
<37 weeks of gestation	58(57.4)	43(42. 6)	**17.22(10.17,29.15) ***	**6.87(2.76,17.07) ****
37-41 weeks of gestation	34(7.3)	434(92.7)	1	1
History of abortion				
Yes	30(19.4)	125(80.6)	**3.75(2.81,11.91) ***	**4.22(1.45,9.66) ****
No	11(3.9)	265(96.1)	1	1
Pregnancy-induced hypertension				
Yes	60(51.7)	56(48.2)	**14.97(9.04,24.77) ***	**5.80(2.23,15.18) ****
No	34(6.7)	475(93.3)	1	1

*statistically significance in COR: P-value<0.05, **statistically significance AOR: P-value<0.05

6. DISCUSSION

This study revealed that the prevalence of low birth weight was found to be 15.04 % (95% CI 12.4-18.1). It was found that age group, monthly family income, Mid-upper arm circumference, Gestational week, History of abortion, and pregnancy induce-hypertension have a statistically significant association with LBW.

In this study, the prevalence of LBW was found to be 15.04 % (95% CI 12.4-18.1). This finding is consistent with the finding of the study conducted in India, in which the prevalence of LBW was found to be 30(13.7%) and another study conducted in India was similar to this study, the prevalence of low birth weight was 55(14%) (7, 29). likewise, this finding is consistent with a study conducted in Pakistan, with the prevalence of low birth weight was 33(14%) (33). Moreover, this finding is in line with a study conducted in Jimma, with the prevalence of low birth weight was (14.3%) (39). This could be due to the studies conducted in hospitals where pregnant women are referred from different health facilities because of a high-risk pregnancy. Besides the studies included preterm birth and mothers with twin pregnancies were not included which may overestimate the prevalence. Moreover, the weight of the newborns was recorded in the first few hours of delivery.

This finding is higher than a study conducted in Southeast Iran, the prevalence of LBW was found to be 12.3% (45) and similarly, this finding higher than the study conducted in Mekelle, the prevalence of LBW was found to be 11.2% (51) This difference could be due to birth weight was taken from written records, unlike this study which is the actual weight of the babies at birth.

However, the finding of our study is higher than the finding of the EDHS 2016 which revealed 10.8% of the births to be LBW(38). The variation might be related to the difference in the study setting and measurement of LBW in which women's self-report was taken in the EDHS study unlike ours which is the actual weight at birth and neonates that were included in the study i.e. twin neonates, a congenital anomaly.

This finding is less than studies conducted in Korea, Qatar, and South Africa, in which the prevalence of LBW was found to be 23.9%, 22.7%, and 27.9%, respectively (30, 35, 42, 46)respectively.

This difference could be due to differences in the study setting. That means this study was conducted in selected public hospitals and health centers whereas the previous studies were carried out in specialized tertiary hospitals where many of the pregnant women were referred from peripheral hospitals because of a high-risk pregnancy. Another possible reason for the lower prevalence of low birth weight in this study could be due to mothers with multiple pregnancies were included in those studies which may overestimate the prevalence, difference in geographical variation which might have a difference in health service utilization, the socio-economic difference in the study population, nutritional status of mothers during pregnancy.

The age group of the mothers was one factor that was associated with low birth weight. Mothers who lie in the age group of between 40 and 49 were 3.16 times [AOR=3.16: 1.06, 9.46] more likely to deliver low birth weight babies than mothers in the age group of 35-39year. Alongside this, a study from India also supports this finding those mothers women whose age was 40 years and over 54% was a higher risk of delivering LBW (43). This finding is higher than the study conducted in Addis Ababa pregnant woman aged 40 and above was a 1.96 times higher risk of having an LBW baby (50). This may be due to the fact that mothers with old age have a depletion of nutrition by previous birth. Moreover could be justified by the fact that older woman abundance of obstetrical complications.

Average monthly income was one factor that was associated with low birth weight. Those mothers with low monthly income were four times [AOR=4.33:1.24, 15.19] more likely to give LBW baby as compared to those who had a higher income. This finding is higher than the study conducted in Malaysia among old age women with less economic status (RM <500) were 0.83: (95% CI 0.71 – 0.97) times more likely to deliver low birth infants compared to those woman from the higher income(55). This finding is higher than a study conducted in Bahir Dar Felge-Hiwot Referral Hospital women who had a lower-income (<70 USD) were three times (AOR=2. 6 (95% CI=1. 16-6.05) more likely to have a low birth weight baby than those who had higher income(40). Alongside this, a study from Bale southeast Ethiopia, also supports this finding those mothers with monthly income low (<26 USD) were four times [AOR=3.8; (95 % CI=1.54–9.41] more likely to give LBW baby as compared to mothers with monthly income high(56). This is since However, mothers with low monthly income may not get adequate nutrition and the low economic status of the mothers in the study area with increased costs of living might hinder

to care pregnant mothers in terms of nutrition and health care. To reduce low birth weight two extra meals are required in addition to the basic three meals. According to world health organization recommendation of frequency of meals per day for pregnant mother which states at least two snacks between meals(73). Women with low monthly income may not get adequate nutrition. For example, in this study, 14.4% of the women did not have access to more than three meals per day, leading to Failure to achieve adequate weight gain during pregnancy to maternal undernutrition and in turn low birth weight.

The other associated factor for mothers with low birth weight babies was Mid-upper arm circumference. Mothers who had MUAC less than 23 cm were 4.49 times [AOR=4.49:1.26,16.02] more likely to have a low birth weight baby than mothers whose MUAC were greater than or equal to 23 cm. This finding is consistent with the finding of the study conducted in Bahir Dar Felge- Hiwot Referral Hospital report that mothers who had MUAC less than 23 cm were three (AOR 3.4(95% CI: 1.38-8.60) times more likely to have a low birth weight baby compared to women whose MUAC was more than 25 cm(40). This finding is higher than the study conducted in Gurage southern Ethiopia those mothers with MUAC less than 23 cm 1.79 times [AOR=1.79: 1.01, 3.16] higher chance of giving low birth weight infants compared to mothers with MUAC greater than 23 cm(74). This finding is higher than a study conducted in Kersa in which those women with MUAC less than 23 cm had 1.6 times [AOR=1.6: 1.19, 2.19] more likely to have low birth weight babies compared to women with MUAC greater than 23 cm(75). Studies conducted in Africa and Asia support this finding those mothers with MUAC less than 23 cm had a higher chance to have LBW babies (76). This recognized fact is due to Failure to achieve adequate weight gain during pregnancy as a result of poor feeding pattern eventually affects the birth weight of the newborn. Poor awareness about diversified food or reduction in the ability to purchase of diversified food items. Maternal malnutrition it compromization of nutrient supply to the developing fetus which indirectly affects the birth weight of the baby.

The other associated factor for mothers with low birth weight babies was Gestational week which is supported with other studies. Those mothers who gave birth before 37 weeks gestational age were 6.87 [AOR=6.87:2.76,17.07] times more likely to have a low birth weight baby as compared to those mothers who gave birth at 37 weeks gestation or more. This finding is less

than a study conducted in Southeast Iran Women who were less than 37 gestational weeks delivery was 22.1 [AOR= 22.1; (95% CI 20.46 – 23.80] times more likely the risk of low birth weight infant compared mothers who gave birth at 37 weeks gestation or more (45). This finding is higher than the study conducted in South Africa mothers who gave birth before 37 weeks gestational age were 1.37 times more likely to have low birth weight baby compared to those mothers who gave birth at gestational age more than or equal to 37 weeks gestational age(36). In another study from Nigeria, women who have preterm delivery had 94.1% of their babies in the low birth weight(53). This finding is less than the study conducted in Bahir Dar indicated that those mothers who gave birth before 37 weeks gestational age were 18 [AOR=18. 2. 95%CI=9.26-35.94] times more likely to have a low birth weight baby as compared to those mothers who gave birth at 37 weeks gestation or more(40). This finding is less than the study conducted in Debre Markos referral hospital reported that those newborn born before 37 weeks of gestation had 14.14 [AOR=14.14, 95% CI= 5.838, 34.24] times more likely to have low birth weight baby than compare to those newborn born more than 36 weeks of gestation (61). This finding is less than a study conducted in Gurage women whose gestational age less than or equal to 36 weeks have 25 [AOR 24.94 (95% CI = 12.38 - 50.27] times higher risk of LBW compare to mothers whose gestational age more than 37 weeks or more (74). This since, the baby was born before reaching the optimal time at which the highest maternal weight gain occurs, which affects birth weight. On the other hand, before 37 weeks of gestational week's fetal growth and development couldn't be completed. Hence, the fetus may not gain adequate weight during its birth.

The other associated factor for mothers with low birth weight babies is pregnancy-induced hypertension. Mothers who had pregnancy-induced hypertension were six times [AOR=5.80:2.23, 15.18] more likely to have low birth weight babies than those who did not pregnancy-induced hypertension during the current pregnancy. A similar study from Bahir Dar Felge- Hiwot Referral Hospital also supports this finding mother who had pregnancy-induced hypertension were six [AOR= 6.5(95%CI=3.06-14.00] times more likely to have low birth weight baby than counterparts (40). This finding is in line with a study done in Debre Markos referral hospital mothers who had pregnancy-induced hypertension were six [AOR=6.13, 95% CI, 2.69-13.98] a higher risk of getting low birth weight newborn compared to those with no history of hypertension during current pregnancy (77). This finding is consistent with the finding

of the study conducted in Mekelle Ayder Comprehensive Specialized Hospital report that advanced age women who have pregnancy-induced hypertension were four [AOR 4.15, (95% CI 2.272–7.575] times more likely to deliver low birth weight baby than those who did not pregnancy-induced hypertension during current pregnancy (51). This finding is consistent with the finding of the study conducted at Wolayita Sodo University Mothers who had a history of hypertension during current pregnancy were six times [AOR=6.955;95%(2.386-20.275)] times more likely to give LBW baby than those who did not (78). This finding was supported by studies done in India(29) Pakistan (33) southeast Iran(45). This might because hypertension during pregnancy is related to poor perfusion of blood through the placental and placenta is an essential organ which supplies blood and other essential nutrients to the fetus from its mother so the fetus is not getting adequate nutrient which affects the birth weight and normal growth and development of the fetus (79). Moreover Early termination of the pregnancy before reaching the optimal time because of hypertension which affects the birth weight of the fetus.

The other associated factor in this study is the history of abortion. . Mothers who had a previous abortion history had 4.22 [AOR=4.22:1.45, 9.66] times more likely to have low birth weighted babies compare to counterpart. This finding is consistent with the finding of the study conducted in India reported that mothers who had a history of abortion were 3.1 (OR=3.1; CI: 1.7-5.4; p< 0.05) times more likely to have LBW babies than those with no history of abortion (80). This finding is higher than a study conducted in Chania mothers who had a history of abortion were 1.36 [AOR = 1.36 (1.04, 1.78)] times the risk of LBW than those with no history of abortion (81). This finding is higher than the study conducted in Pakistan mothers who have a history of previous abortion in their lifetime were 1.22 [AOR=1.22: 1.06, 2.35] times more likely to have LBW babies than those who haven't the event (82). This finding is higher than the study conducted in Adwa General Hospital Mothers who had a history of abortion were 2.4 [AOR=2.4: 1.74, 15.32] times more likely to have LBW babies than those with no history of abortion(83). This finding is higher than the study conducted at Hawassa University Mothers who had a history of abortion were 1.87 [RR = 1.87 (2.53, 12.5)] times more likely to have LBW babies than those with no history of abortion (84). This finding was supported by other studies mothers who had a previous abortion history had a significantly higher risk for delivering LBW babies in India(7) and Iraq (31). This could be due to the studies conducted in hospitals. The possible explanation for this might be cervical insufficiency as a result of physical damage to the cervix

caused by stretching of the cervical canal through dilatation and curettage, cervical and uterine adhesions as a result of post-abortion complications result in preterm birth subsequently low birth infants(85, 86) and Also, abortion can lead to cervical incompetence and uterine abnormalities resulting in intrauterine growth restriction, which subsequently causes low birth weight infants (87) (32).

7. STRENGTH AND LIMITATION OF THE STUDY

7.1 limitation of the study

- Cross-sectional nature of the study: difficult to establish cause and effect

  Relationship.

- Private health facilities were not included, which might undermine generalizing the result to the general population.

7.2 Strength of the study

- The weighting scale used for this study is frequently calibrated.
- The weight measurement is taken by trained midwives.
- Moreover, the birth weight is measured within one hour of the childbirth

8. CONCLUSION

The prevalence of low-birth-weight is high (15%) compared with national studies. Age group, monthly family income, mid-upper arm circumference, gestational age, history of abortion, and pregnancy-induced hypertension were found to be significantly associated with low-birth-weight in Addis Ababa, Ethiopia.

9. RECOMMENDATION

Based on the result of the study's findings the following recommendations are forwarded:-

1. Although there are policies on implementation that focus on maternal nutrition during pregnancy the regional health bureau may need to strengthen maternal nutrition education especially diversify food eating and better monitoring of weight gain during ANC.
2. Counseling pregnant mothers on what makes pregnancy risky and factors that lead to LBW is important.
3. Health care professionals counseling and ensuring access to health information for pregnant mothers on the major risk factors of LBW and its consequence is very vital for both facilities or community-level intervention.
4. Health care professionals need to counsel couples, who seek to have a child in their older ages, about the risks of old maternal age pregnancy.
5. Further research should be conducted regarding the effect of advanced maternal age pregnancy on perinatal outcomes using a strong study design.

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11. ANNEX

Annex 1. Information Sheet

The English Version of Structured Questionnaires

Addis Ababa University College of Health Science Scholl of Public Health:

Questionnaires among women aged 35 years and above who delivered in public health facilities in Addis Ababa, Ethiopia.

How are u? My name is _____ I am a postgraduate student in public health at Addis Ababa University and intend to research Addis Ababa, Ethiopia I am here to study the magnitude and factors associated with low birth weight baby among public health facilities of Addis Ababa. You are selected to participate in this study just by chance

The benefit of the study: there is no direct short term benefit for participants. However, this study will help us to improve the mother and fetus service for caregivers and the community as a whole and it may also be used by the policymakers to evaluate the service and help them to improve it.

Risk of the study: answering the questionnaires may consume time about 15-30 minutes.

Right of the participants: Respondents have full rights of not a participant and free to withdraw their consent or discontinue participation in the study if they want to do so.

Confidentiality: participating in this study is purely voluntary. Names and other identifying characteristics will not be written on the questionnaire and will not be used during the report write-up as well. The information collected will be kept confidential and no one except the research team members will have access to the raw data. The information received from respondents will only be used for the study.

For further concerns: - Name of the principal investigator: Meseret Melaku Address: Cell phone No - 0912025618 Email: E-mail:mesiwtsa2014@gmail.com

Note: All participants must be in the age group 35 years and above

Annex 2: Consent form

I have read and understood the content of this document. I consent to participate in the study described above; I understand that I may withdraw this consent at any time without any effect on my care.

Are you willing to participate in the study?

1. Agree to participate
2. Not agree to participate (stop here)

If you agree (1 is selected), proceed to the next page If you don't agree (2 is selected), -please stop here and Thank You!

If the study subject agrees to participate in the study, thank her and start the interview.

Interviewer signature certifying that informed consent has been given verbally by the respondent.

Interviewer's Name---------- Signature----------Date----------

Name of health center/Hospital ----------Questionnaires ID----------Supervisor's name----------Signature ----------

Annex 3: English Questionnaire

Section One. Socio-Demographic and Economic Characteristics

No	Questions	Response	Remark
101	In what month and year were you born?	1. Month . . . . . . 2. Don't know month . . . . . . 3. Year . . . . . . 4. Don't know year	
102	What is your current marital status?	1. married 2. single 3.Divorced 4.Widowed 5.Separated	
103	What is your ethnicity	1.Amhara 2.Oromo 3.Tigre 4.Gurage 5.Other	
104	What is your religion	1.Orthodox 2.Protestant 3.Muslim 5.Others	
105	Can you read and write in any language that you speak with?	1. yes 2. no	If no go to Q106
105.1	What is your attended level of education?	1. ----------Grade 2. Informal	

106	Can your husband read and write any language that he speaks with?	1. yes 2. no	If no go to Q107
106.1	What is your husband attended the level of education?	1. ---------- Grade 2. Informal	
107	What is your main occupation?	1. Housewife 2. Government employee 3. Private/NGO employee 4. Self-employee 5. Student 6. Merchant 7. Farmer 8. Other, Specify	
108	What is your husband's main occupation?	1. No occupation 2. Government employee 3.Private/NGO employee 4.Self employee 5. Student 6. Merchant 7. Farmer 6. Other, Specify	

109	What is your household family size?	----------	
110.	What is the average monthly income of the household?	----------	
Part 2: Maternal and obstetric characteristics			
201	Height	----------in centimeter	
202	Weight	----------in kg	
203	MUAC	----------in centimeter	
204	Gestational age at delivery	Gestational age at delivery in weeks:----------	from Medical record
205	During your life, how many times have you become pregnant including the current	---------- number	

	pregnancy (Including a pregnancy that miscarried, was aborted, or ended in a stillbirth)?		
206	During your life, how many times have you given live birth?	---------- number	
207	What is the birth interval between the index and the previous child? If first birth consider the date of marriage	----------months	
208	When you got pregnant, did you want to get pregnant at that time?	1.yes 2.no	
209	Have you visited any health Institution for ANC services for the current pregnancy?	1. yes 2. no	If no go to Q210

209.1	How many months pregnant were you when you first received antenatal care services for this pregnancy? (record in a month)	1. month ---------- 2. do not remember	
209.2	How many times did you receive antenatal care during your current pregnancy	1. Number of times: ---------- 2. Don't know	
210	During this pregnancy, were you given an injection in the arm to prevent the baby from getting tetanus that is convulsion after birth?	1.yes 2.no	If no go to Q211
210.1	If yes, How many doses?	---------- dose	
211	During this pregnancy, were you given or buy any iron tablet?	1.yes 2.no	If no go to Q212
2.11.1	If yes, How many days?	----------days	
212	During this	1.yes	

	pregnancy, did you take any drug for intestinal worms?	2.no	
213	During this pregnancy have you got nutritional counseling during pregnancy?	1.yes 2.no	
214	During this pregnancy, did you take an additional diet than the usual?	1.yes 2.no	If no go to Q215
214.1	During this pregnancy, how many times did u eat per day?	----------	
215	What kind of food consumed over the previous 24 hours?	----------	

216	During your current pregnancy, have you been told that you have anemia?	1.yes 2.no	If no go to Q218
216.1	Hemoglobin level?	1. ---------- gm/dl	Medical record
217	Have you ever had an abortion? (Pregnancy terminated before 28	1.yes 2.no	

	weeks of gestation)		
218	Pregnancy-induced hypertension?	1.yes 2.no	Medical record
229	Gestational diabetes mellitus?	1. yes 2. no	Medical record
220	During this pregnancy, have you ever had vaginal bleeding after seven months of pregnancy?	1.yes 2.no	
221	Have you ever had a history of a small baby?	1.yes 2.no	
222	Have you ever had a pregnancy that was stillbirth?	1.yes 2.no	
223	Birth weight of the child?	---------- in gram	
224	Sex of the child	1.male 2.female	
Part 3: Life-style/personal habits during pregnancy			
301	Have you ever consumed alcohol during the current Pregnancy? (drinks like Tella, Tej, Areke, beer, wine, etc)	1.yes 2.no	If no go to Q302

301.1	During the last 30 days, how many days did you have a drink that contains alcohol	1.Number of days---------- 2. None in the last 30 days	
302	Have you ever used any form of tobacco (cigarettes, pipes, cigars, and smokeless tobacco), during your pregnancy?	1. yes 2. no	If no go to Q303
302.1	How many cigarettes did you smoke at a time?	_____ Cigarettes	
302.2	During the last 30 days, how many days did you smoke cigarettes?	1.Number of days---------- 2. None in the last 30 days	
303	Have you ever chewed Chat during your pregnancy?	1.yes 2.no	
303.1	During the last 30 days, how many days did you chew Chat?	1. Number of days---------- 2. None in the last 30 days	

Annex 4: Amharic questionnaire
የአማረኛ ጥያቄ

በአዲስ አበባ በየሚገኙ የተመረጡ የመንግስት ህክምና ተቋማት ውስጥ እድማአቸዉ ከ35 አመትና ከዚያ በላይ ለወለዱ እናቶች የተዘጋጀ መጠይቅ

ጤና ይስጥልኝ፡፡ እኔ ---------- እባላለሁ፡፡በአዲስ አበባ ዩኒቨርሲቲ የጤና አጠባበቅ ትምህርት ቤት የማስተርስ ድግሪ ተማሪ የሆነችዉ የመሰረት መላኩ የድህረ ምረቃ ማሟያ ጥናት በዚህ የህክምና ተቋም ምን ያህል መጠን በአነስተኛ ክብደት እንደሚወለዱና ከአነስተኛ ክብደት ጋር ተዛማጅ የሆኑ የእናቶችና የፅንሱን ባህርያቶች ለማጥናት ነዉ እዚህ የተገኘሁት፡፡ እርሶም በአጋጣሚ በዚህ ጥናት እንዲሳተፉ በእጣ ተካተዋል፡፡

የጥናቱ ጥቅም፡ በአሁኑ ጊዜ ጥናቱ ለመረጃ ሰጪው ቀጥተኛ ጥቅሙ ቅርብ ባይሆንም መረጃው ተሰብስቦ፤ተቀነባንሮና ተተንትኖ ከተጠናቀቀ በኋላ ለፖሊሲ አውጪዎች እና ለጤና አገልግሎት ሰጪዎች እንደግብአት በመሆን የእናቶችና የፅንሱን ጤንነት ለመጠበቅ በተመለከተ ወደፊት የጤና አገልግሎት ለማሻሻል ሆነ ጠቃሚ ሀሳቦች ለመሰንዘር ጠቃሚ ነዉ፡፡

የጥናቱ ጉዳት፡ የጥናቱ ጉዳት ሊሆን የሚችለው ጥናቱ ላይ የሚገኙትን መጠይቆች ሞልቶ ለመስጠት ከ15-20 ደቂቃ ሊወስድ ይችላል፡፡

የተሳታፊው መብት፡ ጥናቱ ላይ ያለመሳተፍ፣ መጠይቁን ያለመሙላት እና የጥናቱ ተሳታፊ ያለመሆን መብትዎ የተጠበቀነው፡፡ በፈለጉት ሰዐት ጥናቱን ማቋረጥ ይችላሉ፡፡

የጥናቱ ሚስጢራዊነት ጥናቱ ላይ ሊካተቱ የቻሉበት ምክንያት የተሳታፊዎች አመራረጥ ሂደት በዕድል ላይ መሰረት ያደረገ በመሆኑ ብቻ ነው፡፡ መጠይቁ ላይ የተሳታፊው ስም ወይም አድራሻ እንዲገለጽ አይጠየቅም፡፡ከዚህ በተጨማሪም እርሶ የሚሞሉት መረጃ የሚውለው ለጥናቱ አላማ ብቻ ይሆናል፡፡መረጃው በሚተነተንበት ጊዜም የእርሶም ሆነ የሌሎች የጥናቱ ተሳታፊ የሆኑ ስም ተገልጾ ሪፖርት አይደረግም፡፡

አሁን ግልፅ ያልሆነ ነገር ካለ አስተባባሪውን/ዋን መጠየ ቅይችላሉ፡፡አስተባባሪው/ዋ የማይመልሱት ነገር ካለ ዋና አጥኚዋን በስልክ- 0912025618 ወይምበኢ-ሜሌ: mesiwtsa2014@gmail.com ሊጠይቁ ይችላሉ፡፡

ማሳሰቢያ፡1. ሁሉም ተሳታፊ 35 እና ከዚያ በላይ መሆን አለባቸው

የፈቃደኝነት ማረጋገጫ ቅፅ:-

የጥናቱን አላማ በሚገባ እና ግልጽ በሆነ ቋንቋ ከነገረችኝ በኃላ በዚህ ጥናቱ የሚሰጠዉን ጥቅም እና በእኔ ላይ ምንም ጉዳት እንደማያደርስ ከተረዳሁ በኃላበ ጥናቱ ለመሳተፍ /ላለመሳተፍ ያለምንም ተፅእኖ ወስኛለሁ፡፡

1. ተስማምቻለሁ 2. አልተስማመሁም

ከተስማሙ---- ወደ ሚቀጥለው ገጽ ይለፉ ካልተስማሙ------ እዚህ ጋር ማቆም ይችላሉ፤ አመሰግናለሁ፡፡

ተጠያቂው ለመሳተፍ ፈቃደኛ ከሆኑ መጠይቁን ይጀምሩ

የመረጃ ሰብሳቢ ፊርማ በቃል ስምምነት መስጠቱን ያረጋግጣል፡፡

የመረጃ ሰብሳቢ ስም---------- ፊርማ ---------- ቀን ----------

የጤና ተቋም ስም----------የጥያቄ ቁጥር----------የመስክ ተቆጣጣሪው ስም----------
ፊርማ ---------- ቀን ----------

ክፍልአንድ:

ማህበራዊ፣ ኢኮኖሚያዊ የተመለከተ መረጃ

ቁጥር	መጠይቅ	አማራጮች	ይለፉ
1.	የተወለድሽበት ዓመተምህረትና ወር መቼ ነው?	1. ወር---------- ---- 2. ወሩን አላውቀውም 3. አመተምህረት--------- ---------- 4. ዓ.ም አላውቀዉም	
2.	ያሁኑ የጋብቻ ሁኔታዎ ምንድን ነው?	1. ያላገባች 2. ያገባች 3. የተፋታች 4. ባሏ የሞተባት 5. ተለያይተው የሚኖሩ	
3.	ብሔርዎ ምንድን ነው?	1.አማራ 2.ኦሮሞ 3.ትግሬ 3.ጉራጌ 4.ሌሎችይጠቀስ…….	
4.	ሃይማኖትዎ ምንድን ነው?	1.ኦርቶዶክስ 2. ፕሮቴስታንት 3. ሙስሊም 4. ሌሎች	
5	በሚናገሩበት ማንኛዉም ቋንቋ ማንበብ እና መፃፍ ይችላሉ?	1.አዎ 2.አልችልም	አልችልም ከሆነ ወደ ጥያቄ 6 ይለፉ
5.1	ያጠናቀቁት የትምህርት ደረጃዎ ስንት ነው?	1. የክፍል ደረጃ---------- ---------2.መደበኛ ያልሆነ	
6.	ባለቤትዎ በሚናገርበትን ማንኛዉንም ቋንቋ ማንበብ እን	1.አዎ	አይችልም ከሆነ ወደ

	መፃፍ ይችላል?	2.አይችልም	ጥያቄ 7 ይለፉ
6.1	ባለቤትዎ ያጠናቀቁት የትምህርት ደረጃ ስንት ነው?	1. የክፍል ደረጃ ---------- 2. መደበኛ ያልሆነ	
7.	በአሁን ሰዓት እየሰሩ ያለዉ ዋና ስራ ምንድን ነው?	1. የቤት እመቤት 2. የመንግስት ሰራተኛ 3. የግል ስራ 5. ተማሪ 6. ነጋዴ 7.ገበሬ 8. ሌላ (ይገለጽ) ----------	
8.	ባለቤትዎ በአሁን ሰዓት እየሰሩ ያለዉ ዋና ስራ ምንድን ነው?	1. ስራ የለውም 2. የመንግስት ሰራተኛ 3. የግል ስራ 5. ተማሪ 6. ነጋዴ 7.ገበሬ 8. ሌላ (ይገለጽ) ----------	
9.	የቤተሰባችሁ አባሊት ብዛት ስንት ነው?	----------	
10.	ጠቅላላ የቤተሰብዎ ወርሀዊ ገቢ ስንት ነው? (በኢትዮጵያ ብር)	----------	

ክፍል ሁለት:የእናታዊ እና እርግዝና ሁኔታ መረጃዎች

2.1	ክብደት	----------ኪ.ግ.	
2.2	ቁመት	----------ሴ.ሜ.	
2.3	የሊይኛው ክንዴ ዙሪያ.	----------ሴ.ሜ.	
2.4.	በስንተኛ ወር ነዉ የወለደችዉ?	----------ወር	ከህክምን መዝገብ ይዉሰዱ
2.5	የአሁኑ ስንተኛ እርግዝናዎ ነዉ? (ዉርጃ እና ሞቶ የተወለደ እርግዝናም ካለ ይቆጠር)	----------	
2.6	በአጠቃላ ስንት ጊዜ ልጅ በህይወት ወልደዋል?	----------	
2.7	በአሁኑ እና በቅድሞዉ ልጅ መካከል ያልው የወራት ብዛት ስንት ነዉ? (የመጀመሪያ ልጅ ከሆነ ካገባች ቀን ያስቡ) (በወር ይጠቀስ)	----------	
2.8	እርግዝናዉን አስበዉበት/ፈልገዉት ነበር ያረገዙት?	1. አዎ 2. አይደለም	
2.9	በአሁኑ እርግዝናሽ ወቅት የጽንስ ክትትል አድርገዋል?	1. አዎ 2. አላደረኩም	አላደረኩም ከሆነ ወደጥያቄ 2.10 ይለፉ
2.9.1	በአሁኑ እርግዝናዎ በአረገዝሽ በስንተኛ ወርሽ ላይ ነው ክትትል የጀመርሽው?	1. ---------- 2. አላስታውስም	
2.9.2	በአሁኑ እርግዝናሽ በአጠቃላይ ስንት ክትትል ነበረሽ?	1. ---------- 2. አላስታውስም	
2.10	በዚህ እርግዝና ወቅት መንጋጋቆሌፍ (TT) ክትባት ወስደዋ?	1. አዎ 2. አልወሰድኩም	አልወሰድኩም ከሆነ ወደ ጥያቄ 2.11 ይለፉ
2.10.1	መልስዎ አዎ ከሆነ፡ስንት ጊዜ ወስደዋል?	----------	
2.11	በዚህ እርግዝና ወቅት የተሰጠሽ ወይንም ገዝተሽ የወሰድሽው ለደም ማነስ የአይረን ፎስፌት	1. አዎ 2. የለም	የለም ከሆነ ወደ ጥያቄ 2.12 ይለፉ

	ኪኒንአለ?		
2.11.1	መልስዎ አዎ ከሆነ፡ ለስንት ቀን ወስደዋል?	----------ቀን	
2.12	በዚህ እርግዝና ወቅት የትላትል ኪኒን ወስደዋል?	1. አዎ 2. የለም	
2.13	በጽንስ ክትትልሽ ወቅት ስለአመጋገብሽ ምክር ተሰጥቶሽ ነበር?	1. አዎ 2. አይደለም	
2.14	በአሁኑ እርግዝናሽ ጊዜ ከወትሮ የተለየ ተጨማሪ ምግብ ተመግበሻል?	1. አዎ 2. አይደለም	
2.14.1	በዚህ እርግዝና ወቅት በቀን ስንቴ ይመገቡ ነበር?	----------	
2.15	ባለፈዉ ሃያአራት ሰአት ውስጥ ምን አይነት ምግብ ተመግበዋል?	----------	
2.16	በዚህ እርግዝና ወቅት የደም ማነስ እንዳለብዎ ተነግሮዎታል?	1. አዎ 2. የለብኝም	
2.16.1	የሂሞግሎቢን መጠን?	1. ----------gm/dl	ከህክምን መዝገብ ይዉሰዱ
2.17	ከዚህ በፊት ሰባት ወር ያልሞላዉ የፅንስ ዉርጃ አጋጥሞሽ ያቃል?	1. አዎ 2. አያውቅ	
2.18	ደም ግፊት ህመም?	1.አዎ 2. የለም	ከህክምን መዝገብ ይዉሰዱ
2.19	ስኳር ህመም?	1.አዎ 2.የለም	ከህክምን መዝገብ ይዉሰዱ
2.20	በዚህ እርግዝና ወቅት፣ከሰባት ወር እርግዝና በኋላ የደም መፍሰ ስአጋጥሞዎት ነበር?	1. አዎ 2. የለም	
2.21	ከዚህ በፊት ክብደቱ ዝቅተኛ (ከ2.5 ኪ.ግበታች) የሆነ ልጅ ወለደሰሻል?	1. አዎ 2. አሎለድኩም	

2.22	ከሰባት ወር በኋሊ ሞቶ የተወለደ ልጅ ኢጋጥሞሽ ያውቃል?	1. አዎ 2. አያውቅ	
2.23	አሁንየ ተወለደው ህጻን ክብደት?	በግራም----------	
2.24	አሁን የተወለደው ህጻን ጾታ	1. ወንድ 2. ሴት	

3. ክፍል ሶስት: ስለ አሁኑ እርግዝና የተመለከቱ ጥያቄዎች

3.1	አልኮል ያለው መጠጥ በእርግዝናዎ ወቅት ጠጥተው ያውቃለ? (ለምሳላ፡- ጠላ፣ጠጅ፣አረቄ፣ቢራ፣ወይንወ.ዘ.ተ…)	1. አዎ 2. አላውቅም	አላውቅም ከሆነ ወደ ጥያቄ 3.2 ይለፉ
3.1.1	በለፉት 30ቀናት ውስጥ ምን ያህል ቀናት አልኮሆል ያለው መጠጥጠ ጥተውነ በር?	1.-------ቀናት 2አልጠጣሁም	
3.2	በአሁኑ የእርግዝና ጊዜ የትኛዉንም የትምባሆ/ሲጋራ አይነት ተጠቅመዉ/አጭሰዉ ያዉቃሉ?	1. አዎ 2. አላውቅም	አላውቅም ከሆነ ወደ ጥያቄ 3.3 ይለፉ
3.2.1	አንዴ ጊዜ ሲያጨሱ ምን ያህሌ ሲጋራ(ዎች) ያጨሱ ነበር?	--------- ሲጋራ(ዎች)	
3.2.2	ባለፉት ሰላሳ ቀናት ውስጥ ለምን ያህሌ ቀናት ሲጋራ አጭሰው ነበር?	1.-------ቀናት 2.አላጨስኩም	
3.3	በእርግዝናዎ ወቅት ጫት ቅመውያውቃለ?	1. አዎ 2.አላውቅም	
3.3.1	ባለፉት ሰላሳ ቀናት ውስጥ ለምን ያህሌ ቀናት ጫት ቅመው ነበር?	1.----ቀናት 2.አልቃምኩም	