ADDIS ABABA UNIVERSITY
COLLEGE OF HEALTH SCIENCES
SCHOOL OF NURSING ANDMIDWIFERY
DEPARTMENT OF NURSING AND MIDWIFERY

DETERMINANTS OF LOW BIRTH WEIGHT AMONG NEWBORNS DELIVERED AT Addis Ababa PUBLIC HOSPITALS (UNMATCHED CASE CONTROL STUDY), ADDIS ABABA, ETHIOPIA, 2018/2019

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A PROPOSAL TO BE SUBMITTED TO THE SCHOOL OF NURSING AND MIDWIFERY COLLEGE OF HEALTH SCIENCE ADDIS ABABA UNIVERSITY FOR THE PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTERS OF SCIENCE IN PEDIATRIC AND CHILD HEALTH NURSING.

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Full title	Determinants of Low Birth Weight among newborns delivered at Addis Ababa public Hospitals :A case control study
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LIST OF ABBREVIATIONS

ANC: Antenatal care

AOR: Adjusted odds ratio

APH; Antepartum hemorrhage

BW: Birth weigh

CI: Confidence interval

COR: Crude odds ratio

CS: Cesarean section

EDHS: Ethiopia demographic and health survey

GA: Gestational age

IUGR: Intrauterine growth retardation

LBW: Low birth weight

MUAC: Mid upper arm circumference

NBW: Normal birth weight

PIH: Pregnancy induced hypertension

PROM: premature rapture of membrane

SGA: Small-for-gestational age

STI: sexual transmitted infection

VLBW: Very low birth weight

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SUMMARY

Background: Low birth weight is closely associated with fetal and neonatal morbidity, inhibited growth and cognitive development, and chronic diseases in life. Birth weight also predicts the child's future health, growth, psychosocial development, and survival. Low birth weight can be defined as weight at birth less than 2,500 grams irrespective of gestational age. In developing countries, a birth weight below 2,500 grams is the leading cause of infant and child mortality and contributes to several poor health outcomes. In Ethiopia, the prevalence of LBW is as high as more than 13% according to studies from different regions of the country. Birth weight is a good summary measure of multifaceted public health problems that include long-term maternal malnutrition, ill health, and poor health care during pregnancy.

Objectives: Main aim of this study is to identify determinant factors of low birth weight among newborns delivered in Addis Ababa public hospitals 2018/2019.

Methods: A hospital based unmatched case control study will be conducted among 279 deliveries from March to April 1 2019 in Addis Ababa public hospitals, Ethiopia. The sample size is determined using double population proportion formula N=279. Consecutive sampling technique will be used to get cases and systematic sampling to get controls. Data will be collected by interviewing the mothers, reviewing medical records and measuring the anthropometry of the mothers and the newborns using structured and pretested questionnaire. Data will be entered using Epi-data 4.12 software and analysis will be done using SPSS 23. Variables that show significant association in the bivariate logistic regression analysis ($p<0.25$) will be entered in multivariable logistic regressions model. Adjusted odds ratio with 95% confidence interval (CI) and p value ≤ 0.05 will be used to claim statistical significance.

Work plan: The study will be conducted from September to June, 2018/2019.

Budget: The total budget required for this project is 35970 Ethiopian birr

Keywords: Low birth weight, Determinants, Case control, Addis Ababa

1. INTRODUCTION

1.1 Back Ground

Birth weight or size at birth is an important indicator of the child's vulnerability to the risk of childhood illnesses and diseases. Birth weight also predicts the child's future health, growth, psychosocial development, and the chances of survival. Low birth- weight (LBW) defined by World health organization as the weight of a neonate below 2500 grams at birth, often corresponding to the 10th percentile for its gestational age (1).This practical cut-off for international comparison is based on epidemiological observations that infants weighing less than 2,500 grams are approximately 20 times more likely to die than heavier babies (2).
Worldwide 20 million neonates are born with LBW, 95% of who reside in developing countries. Africa, carries the second highest burden of LBW (14.3%) after Asia (18.3%) (3)

Low birth weight is considered as the single most important predictor of infant mortality, especially in deaths that are happen within the first months of life (4). Globally, 60–80% of neonatal deaths occur among low birthweight (1).LBW is a result of preterm birth, intrauterine growth restriction, or a combination of both pathophysiologic conditions. There are numerous maternal and fetal factors contributing to LBW. Weight at birth is directly influenced by general level of health status of the mother. Maternal environment is the most important determinant of birth weight, and factors that prevent normal circulation across the placenta cause poor nutrient and oxygen supply to the fetus, restricting growth. The maternal risk factors are biologically and socially interrelated; most, however, are modifiable (5).

In developing countries, a birth weight below 2,500 grams is the leading cause of infant and child mortality and contributes to several poor health outcomes (2).It is associated with poor neurological and cognitive development, childhood morbidity, growth impairment, a range of poor health outcomes, and chronic diseases later in life.

More common in developing than developed countries, a birth weight below 2,500 g contributes to a range of poor health outcomes. Those who survive have impaired immune function and increased risk of disease; they are likely to remain undernourished, with reduced muscle

strength, throughout their lives, and to suffer a higher incidence of diabetes and heart disease (6). Children born underweight also tend to have cognitive disabilities and a lower IQ, affecting their performance in school and their job opportunities as adults (2).

1.2 Statements of the problem

Globally, it is estimated that 15% to 20% of all births worldwide are low birth weight, representing more than 20 million births a year (7). The incidence has not declined in the last decade in Sub-Saharan Africa (SSA) and Asia (8).

The goal of 2012 World Health Assembly was a 30% reduction in the number of infants born with a weight lower than 2500 g by the year 2025. This would translate into a 3% relative reduction per year between 2012 and 2025 and a reduction from approximately 20 million to about 14 million infants with low weight at birth(7). Africa is a home for 22% of low birth weight and in sub Saharan Africa LBW level is around 13–15% with a little variation across the regions (9). In Ethiopia Prevalence of LBW is high. In 2012 the United Nations Children's Fund (UNICEF) estimated the national prevalence of LBW was 20% (10).

According to EDHS 2016 the proportion of births weighing less than 2.5 kg in Ethiopia at birth in the past three DHS surveys was 14% in 2005, 11% in 2011, and 13% in 2016 (11). Similarly in different studies Ethiopia showed that 10.5% of live births in the northern region (12), 11.2% of deliveries in Gondar were LBW (13) .According to EDHS 2016 reports in Addis Ababa the prevalence of LBW is 11.4% (14), 11.5% (11), in 2011, and 2016 respectively.

Low birth weight is an index of our status of public health, maternal health and nutrition. LBW continues to be a significant public health problem globally and is associated with a range of both short- and long-term consequences unless early screening and interventions have been made. Some of the long term complications of LBW include Hypertension, diabetic nephropathy, proteinuria, progressive renal disease in late age, eye problems like strabismus and myopia ,deafness, neurologic complications like cerebral palsy, develop mental delay with intelligence quotient (IQ) less than 70, epilepsy and behavioral disturbance (12) (15).

The etiology of LBW is yet to be completely understood even though several studies have attempted to unravel the underlying causes. Constitutional factors such as sex (1), maternal height

(16) and weight (17) have been identified as risk factors for LBW. Similarly, maternal health, demographic and nutritional factors which include maternal age, parity (18) ,birth interval (1),multiple gestation, maternal comorbidity (19), and skilled antenatal care (18) have been linked with LBW. In addition, maternal socioeconomic and psychological factors which comprise education (1), alcohol intake (20), occupation (5), wealth status (1),and domestic violence (21) were also found to be associated with LBW.

Apart from regional variations, low birth weight was more common among children of the youngest mothers (age less than 20 years) and older mothers (age 35–49 years). Furthermore, first-order births, children of mothers with no education, and children born to mothers in the lowest wealth quintile were the most likely to be reported as very small (14). On the other hand, factors like lack of antenatal follow-up, preterm delivery, chronic medical illness, lack of formal education, young age of the mother, and so forth were reported to be associated with low birth weight from different studies (12) (14, 22).

Having proper knowledge of risk factors for low birth weight is important to identify and giving appropriate attention to those mothers at risk. The Ethiopian government has acknowledge the severity of the problem, and currently some measures are taken by the government, non-governmental organizations (CU- ICAP, WHO) and professional associations like Ethiopian pediatric society (23, 24).

Despite few studies available to show determinants of low birth weight across the country, particularly in Addis Ababa, was not suffice to explicitly identify determinants of LBW and prevalence of LBW is still high in study area.

Therefore, the purpose of this study is to investigate predictors of low birth weight. Findings from this study will add to the current knowledge about risk factors of low birth weight particularly regarding nutritional factors, maternal MUAC, BMI and pregnancy complication like APH, premature rupture of membrane during pregnancy which has not been well explained by other studies. This will have great relevance in identifying mothers and children at risk by designing appropriate measures, and undertaking timely interventions.

2. LITERATURE REVIEW

2.1 Magnitude of LBW

Low birth weight has been defined as weight at birth less than 2,500 grams regardless of gestational age. Newborns low weight at birth is related either the result of preterm birth (i.e., before 37 weeks of gestation) or the result of restricted fetal (intrauterine) growth(3) . LBW is concentrated in two developing regions of the world mean that with 72% of LBW infants born in Asia and 22% in Africa but Central and South America have, on average, much lower rates (10 per cent) (3). In Ethiopia, the incidence of LBW has significantly varied across the area of residence, 15.4% in rural and 10.9% of the urban area(11). Studies in Gondar teaching hospital and rural population of Kersa district also reported 17% and 28% prevalence, respectively(25, 26).

A study in Iran showed majority (89%) of neonates had normal birth weight and 11% of them belonged to the LBW category. Forty six percent males and 43% females had normal birth weight, whereas 5% males and 6% females had low birth weight(27).Other study in India 40% mothers delivered LBW babies. Out of total 350 newborn babies, 156 (44.5%) were females and 194 (55.5%) were males and there was no significant difference between LBW and gender. Proportion of LBW babies was more for Muslim mothers (58.7%) (17).

In Zimbabwe at Harare maternity hospital over the 3-month period 16.7% (n = 520) were LBW births, of which 60 (11.5%) were VLBW and 18 (3.5%) were ELBW. About 493 (15.9%) were preterm births, 199 (6.4%) were term LBW, 302 (9.7%) were preterm LBW, and only 191 (6.2%) were preterm without LBW. Age of mother ranged from 13 to 49 years (mean = 24.4 years). Very few mothers (7.3%) were above 34 years old (20).

Across sectional analytical study in Kenya the prevalence of LBW was 12.3% (n=40). The mean age of mothers was 25.6±6.2 years. Mean birth weight was 2928±533 grams. There were 51.1% (n=165) male neonates and 48.9% (n=158) females (28).

A prospective cohort done in Mekele indicates in the two hospitals during the 6-months study 28% and 13% of the babies were born before 37and 32 weeks, respectively. Sixty percent of neonates

were born from the multiparous mothers. In total, 35% and 54% of the neonates weighed <1,500 (VLBW) or <2,500 grams ((LBW), respectively (29).

A cross sectional study in Gondar town indicates the mean gestational age of the newborns was 39.49±1.53 weeks. The mean age of the respondents was 25.8±5.5 years and the overall prevalence of low birth weight was 17.4% (30).similar study in Wolaiyta Sodo showed proportion of term low birth weight was 8.1% (35/432). Mean weight of the newborns was 3532 g with standard deviation of 565(31).EDHS 2016 data showed that in Affar nearly four children of every ten (39.1%), and in Amhara nearly two children of every ten (21.8%) born to mothers were reported as very small at birth (11).

2.2 Determinants of LBW

2.2.1 Sociodemographic factors

Findings on determinants of LBW in developing countries revealed maternal age of 35 to 49 years is two times risk for LBW with AOR 1.7 (95% CI 1.2 to 3.1) p<0.01(34) but a case control study done in Nepal maternal age ≥30 is a protective factor for low birth with AOR 0.15 (95% CI 0.04–0.53) p<0.003(31) .Differently in Kuala Lumpur, Malaysia being younger in maternal age was three times risk of having LBW babies compared to older age group 2.89 (1.86 - 4.51)(8). Cross sectional study in Iran extremes of Maternal age at delivery, <18 and >35 years old was associated with increased risk of LBW with AOR 1.26 (95% CI1.05-1.52) p =0.012 and AOR 1.21 (95% CI11.08-1.36) p =0.001 respectively (38) and in Cameroon maternal age > 36 years has fourteen times risk for LBW (AOR= 14.5, 95 % CI 1.7 - 123.5; p =0.01) (32)

In Ethiopia Different studies consistently showed maternal age is a risk factor for LBW. A study done in Adwa General Hospital and Bale zone hospitals revealed maternal age less than 20 years were 1.7 times and three time more likely to deliver LBW babies than mothers aged 20–34 years respectively (39) (24).

Findings in Zimbabwe on marital status Separated, Divorced or Widowed was significantly associated with LBW in All births and preterm 1.35 (1.01–1.81) 1.58 (1.08–2.31) births but significant association was not observed in term birth newborns (20). The other case control

study in Central Ethiopia revealed non-married women had four times odds of giving LBW newborns as compared to married ones (32).

Different studies on maternal educational status revealed that being illiterate was two times risk of being born LBW AOR 1.91 (95% CI 1.66-2.20) (33, 34).

According to EDHS 2016, result showed that mothers with no education are more likely to have low birth weight (18%) as compared to women with primary (11%) and secondary education (8%) (11).Similarly studies in different parts of Ethiopia mothers with lower educational status strongly associated with LBW. In Bale zone mothers who had no formal education were six times risk to give LBW (35) and wolaita Sodo maternal educational status primary and below were six times risk of LBW (31)

Studies revealed maternal occupation was risk factors of LBW, In Bale mothers who were merchant by their occupation were 90 % less likely to deliver LBW babies compared to employed mothers (AOR= 0.1; (95 % CI = 0.02–0.52))(35) and in wolaita sodo being a house wife increase five times risk or chance of giving LBW babies (31)

Different Case Control Studies revealed maternal short stature is predictors of LBW. Maternal height <145 cm, in India four times (36) , Eastern Nepal twenty times (37), Cameroon fourteen times (38), Morocco Khi-2 = 5.7 , p< 0.01(19) odds of LBW than those mother who has weight greater than or equal to 150 cm.

Acase control study on risk factors of LBW in India showed that lower pre-pregnancy weight (<55 kgs) of the mother resulted in low birth weight of newborn (39).similarly full term low birth weight was significantly associated with maternal weight before delivery <55 kg was five times risk of being deliver LBW babies (36).

In India results showed that families who had an income of less than 2.5 million in Rials per month gave birth to neonates with the mean birth weight of 2.9 kg, while pregnant women with > 3.5 million in Rials per month gave birth to neonates with the mean birth weight of 3.6kg (5). Likewise full term low birth weight was three times significantly associated with low socio-economic status of the mother (36).The other studies revealed being in the poorest

socioeconomic stratum significantly associated with the risk of having LBW (AOR, 1.4; 95% CI, 1.1 to 1.8(33).

A study done in Brazil indicates maternal weight gain less than 5 kg during pregnancy was three times risk for LBW and weight gain during pregnancy more than 15 kg is two times risk of getting LBW (40).

A case control study in India indicates women exposed to any tobacco product was 4 times odds (36) and 6 times odds (5) of LBW as compared to those who were not exposed to tobacco

2.2.2 Obstetric factors

Across sectional study in Iran indicates negative association was observed between parity number and the risk of LBW AOR 0.85 (955 CI 0.83-0.88) p<0.001(34). Similarly in Debre Markos primigravida mothers were about five times odds to give LBW than multi parous mothers (41). Different studies worldwide having low or absent Antenatal visit during pregnancy was predictors of LBW. Studies in developing countries revealed that inadequate antenatal care was two times risk of having LBW (33). Similarly in Eastern Nepal ,only 1- 2 times of ANC visits during pregnancy (AOR 172.79 (95% CI 23.57–1266.67) p <0.001) and 3 times visit two times risk factor for LBW(37), India less than four times is five times risk of LBW (36) and in morocco < 3 times ANC visit had five times odds of being LBW (19). Other studies also revealed proportion of cases and controls that had ANC service utilization of three or less was 79.2% and 44.5% respectively. Mothers who had three or less visit were about four times more likely to give LBW than who had four and above visits (AOR=3.81, 95% CI,1.82-7.99)(41). The other study in Amhara Region similarly revealed the odds of LBW was also too higher among mothers who didn't attend ANC as compared to mothers attend ANC follow up in the current pregnancy AOR 2.3,95% (CI 1.3, 4.0)(42) .

According to different studies anemia was risk factors of LBW. In Kerala four times (43) and Qatar mothers who were Anemic have 1.6 times (44) risk of delivering LBW babies.

Similarly studies in Adwa General Hospital results showed that anemic mothers were likely to have low birth weight babies compared to no anemic mothers (45) and in Amhara regional

hospitals the odds of LBW was three times among mothers who did not take iron supplementation during the current pregnancy (42).

Different studies showed that maternal Hemoglobin level <11 gram/dl during pregnancy was predictors of LBW (in Nagpur city of Maharashtra two times (39), Nigeria a 2-5 (46) and in Debre Markos four times (41) odds of giving LBW baby than their counter parts.

Studies across countries revealed that maternal hypertension during pregnancy were risk factor's to give LBW, Case Control Study in Eastern Nepal PIH is 20 times (37) and Kerala mothers who developed gestational hypertension has three times risk of delivering LBW(43). Similar studies done in Cameroon hypertensive disorders in pregnancy is seventeen times (38) , in Debre Markos six times (41) and in Gondar town 9 times (30) more likely to deliver low birth weight baby than those women without hypertension

Several studies explored that any maternal illness during pregnancy was associated with LBW. In Eastern Nepal four times risk factor (31) and in Morocco with Khi-2 = 4.9 (16) were predictors of LBW

A result in different referral hospitals in Northern Ethiopia showed experience of any sign of pregnancy complications (any one or more of bleeding, gush, headache, blurred vision, fever, and severe abdominal pain) were three times more likely to have low birth weight as compared to babies born to mothers who did not have such history (36, 40) and in Amhara region referral hospitals three times odd of to have LBW (42).

Findings showed Antepartum hemorrhage was strongly related with LBW. In Nagpur city of Maharashtra third trimester bleeding (RR=1.87)(39) and in Qatar Antepartum hemorrhage two times **(**AOR 1.6 (95% CI 1.1–2.5)) (44) increased risk of LBW.

A study in Kenya revealed that Premature rapture of membranes was one of the significant risk factors of LBW with (OR=2.95, 95%C.I.=1.14-7.62, p-value=0.04)(28)

2.2.4 Nutritional factors

Unmatched case control study in Debre Markos revealed that frequency of meal per day showed about 70.75% of controls had additional food intake and 62.3% of them greater than four times a day meal. However, 60.4% of cases had no additional food intake and about two third of them (67.7%) had three times or less a day meal. Number of meal per day < three times were found to have statistically significant association with low birth weight with AOR 2.61 (95% CI 1.26-5.38)(41). Similar study in Central Ethiopia mothers with no history of nutrition counseling during pregnancy had three times increased odds of giving LBW babies than those who were counseled (32).

Studies related to maternal MUAC in Amhara region hospitals showed that More than half (61.5%) of mothers in the case group and three quarters of mothers in the control group had a MUAC of below 23 cm with AOR 1.66 (1.02–2.70)(42). Similarly in Zimbabwe maternal MUAC 17 to 28.5 centimeters was significantly associated with LBW in All birth weight, term ,and preterm with AOR 1.75 (1.43–2.16), (2.36 (1.58–3.26) and 1.60 (1.22–2.10) respectively(20)

A study done Zimbabwe showed that maternal BMI Less than 18.49 kg/m^2 were two times odds of LBW in all births but significant association was not observed in term birth and preterm newborns(20). Maternal BMI 25 kg/m^2 and above is a protective factor for all birthweight and term birth weight with AOR 0.09 (0.05–0.18), 0.45 (0.28–0.74) respectively but significant association was not observed in preterm birth newborns(20) and in Bale maternal BMI < 18.50 kg/m^2 was seven times odds of having LBW(35).

A study done in Amhara region hospitals indicates mothers who didn't get iron supplementation were more risk to deliver LBW infant than mothers who took iron supplementation during the current pregnancy with AOR 2.82(1.62–4.91)(42)

Study in Zimbabwe indicates mothers who drank Alcohol during pregnancy significantly associated with LBW in all birth weight and preterm births with AOR 1.29 (1.09–1.52), 1.44 (1.15–1.80) respectively but significant association was not observed in term birth newborns(20).

2.2.5 Neonatal factors

A case control study done in Nagpur Maharashtra mothers who have birth interval of <24 months indicates two times risk factor for LBW (39) and in Iran mothers who has a short birth interval (Less than or =1 year) increased three times risk of low birth weight than those who has greater than 1 years birth interval with AOR 3.26(1.53–6.93) (47).

Several studies showed that female sex was risk factors of LBW. Being female sex In Iran one and half (34) and in Kenya three times AOR 3.37 (95% C.I 1.14-10.00)(48) risk of LBW.

Similarly institutional based cross sectional study in Gondar town revealed being female was found to be significantly associated with low birth weight 52(22.5%) with AOR 2.1(95% CI 1.18, 3.76)(30) and in Amhara Region Hospitals two times higher among female neonates as compared to their male counterparts (42), but a study done in Debre Berhan central Ethiopia and south east Ethiopia doesn't show sex difference in LBW (35, 49). Female newborns had lower birth weight than males (16.6% vs 7.9%).

2.3 Conceptual Framework

Below are the abstract frameworks of the study which shows the interaction of different variables with outcome variables are socio demographic, obstetric, nutritional, and neonatal factors which is adapted in different researches and slightly modified

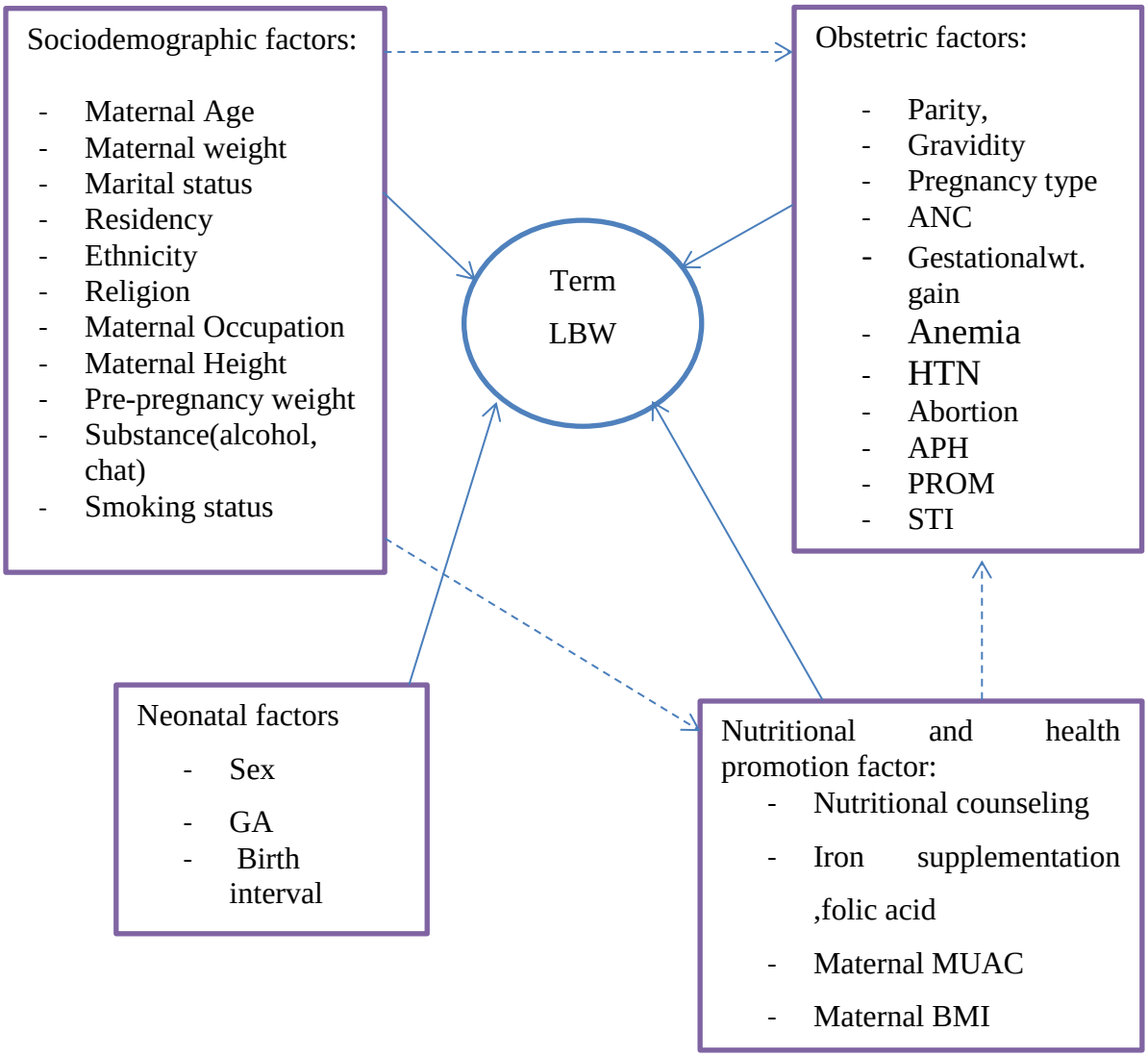

Figure 1.Conceptual framework on determinants of low birth weight among newborns delivered at Addis Ababa public hospitals from March –April 2019, Addis Ababa, Ethiopia (43, 47, 48).

3. JUSTIFICATION OF THE STUDY

With proper Identification of determinants of low birth weight, it is expected and has truly been shown that low birth weight will be minimized. In spite of this, different kinds of literature showed that the low birth weight is still high and contribute significantly to the, neonatal, infant and under-five mortality. Moreover, cognitive and physical impairment have not also been consistent across developed and developing county including Ethiopia. This demands further exploration into the reasons for difference. Different studies in Ethiopia, determined the prevalence of LBW, however limited studies are available on determinants of LBW. As far as the literature search is concerned, there is limited research conducted on different predictors of LBW which is conducted in the study area. So that a hospital based case control studies are required to determine predictors of LBW. Despite this, even if there is an increased in published research from developing countries still there is a scarcity of data, which show determinants of LBW in different settings.

4. SIGNIFICANCE OF THE STUDY

The issue of addressing the determinants of low birth weight is also vital for continual enhancement in survival of neonates which may lead to in future to a growing number of children and adults with long-term.

Known the fact that the death rate of low birth weight neonates contributes significantly to NMR and ultimately to the under-five and infant mortality rate, so that this study will contribute to provision of data that is essential in forwarding planning, especially by prioritizing budgeting and facilities, staffing and training with the aim of improving outcome of preterm and low birth weight neonates in the public healthcare setting and reducing the neonatal mortality rate.

The result of this study will serves as a baseline for other studies as well as for planning health intervention to improve the wellbeing of children and women in Addis Ababa city.

Greater knowledge about the socioeconomic ,obstetric, nutritional and neonatal determinants of LBW will lead to a better evidence based interventions in Ethiopia aiming at reducing neonatal mortality.

Moreover it will assist professionals to provide evidence based practice on newborn care services that will improve the promotive, preventive and curative care of mothers & newborn babies. Lastly this study will provide valuable information to the health professionals, researchers, city health bureau and other stakeholders.

5. OBJECTIVES

5.1. General Objective

To identify determinant factors of low birth weight among newborns delivered in Addis Ababa public hospitals 2018/2019.

5.2. Specific Objectives

1. To identify socio-demographic determinant of low birth weight infants at Addis Ababa public hospitals, Ethiopia, 2018/19.
2. To identify obstetric related factors of Low birth weight at Addis Ababa public hospitals, Ethiopia, 2018/19
3. To determine the nutritional determinants of Low Birth Weight at Addis Ababa public hospitals, Eth iopia, 2018/19.
4. To determine neonatal factors of low birth weight at Addis Ababa public hospitals, Ethiopia, 2018/19.

6. METHODS AND MATERIALS

6.1 Study area and period

The study will be conducted in four random selected public hospitals of Addis Ababa Ethiopia from March to April 2019. Addis Ababa city is divided in to 10 sub-cities containing 116 woredas at which the City lies at an altitude of 7,546 feet (2,300metres). According to population projection value for 2014 the city has an estimated total population of 3,195,000. The proportion of male counts 1,515,000 and female counts 1,680,000 (50). The city has 12 governmental hospitals and nine nongovernmental hospitals. Five hospitals owned by Addis Ababa Health Bureau, 4 by Federal Ministry of Health, one is under the ministry of Education (AAU), 2 by defense force according to Addis Ababa city health office. From those public hospitals all 12 give delivery service and six of them give neonatal service. The study will be conducted in Petros, Yekatit 12, Gandhi memorial and Tirunesh Beijing hospital which are selected by simple random sampling. From those four selected hospitals four of them give delivery service and three of them except Tirunesh Beijing hospital have neonatal intensive care unit According data of Human resource management of each hospital, these hospitals accommodate more than 23000 deliveries per annum.

6.2 Study Design

Hospital based unmatched case-control study design will be conducted among newborns delivered in selected public hospitals.

6.3. Populations

6.3.1. Source of Population

All newborns delivered in Addis Ababa public hospitals will be the source population.

6.3.2. Study population

All newborns delivered in selected public hospitals of Addis Ababa.

6.3.3. Sample Population

All newborns that fulfill the inclusion criteria at the selected public hospitals.

Case: those live singleton term babies with birth weight less than 2500 gm

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

6.4. Eligibility criteria

6.4.1 Inclusion criteria

All newborns with term low birth weight and normal birth weight with no missing the most important information from the record will be included.

6.4.2 Exclusion criteria

Mother and neonate cards having incomplete information, preterm, multiple births, visible deformity, mothers or newborns in critical medical conditions and babies weighed more than an hour after birth will be excluded from the study.

6.5 Sample size determination

The sample size is determined using double population proportion exposure difference formula by considering major determinant variables (Mothers with no formal education [AOR = 2.20 (95% CI: 1.11, 4.38)], Mothers with no history of nutrition counseling during Pregnancy [AOR = 3.35(95% CI: 1.19, 9.43)], Mothers from food insecure households [AOR = 4.42 (95% CI: 1.02, 22.25)] and those mother who were not have booked ANC visit [AOR = 3.03 (95% CI: 1.19, 7.69)] (51) .Considering Mothers with no formal education as independent predictor since it gives maximum sample size as compared to other exposure variables which reduces the role of chance. The sample size is determined using Open Epi version 7.2.0.1 statistical software package by considering proportion of women among controls exposed mothers with no formal education among the controls is 42% (main exposure variable which is estimated from a study performed in North Shewa zone, Central Ethiopia: 95% CI, 80% power of the Study and control to case ratio of 1:2 with 2.2 odds ratio (51) gives sample size of 254.

$$n = \left(\frac{r+1}{r}\right)\frac{(\bar{P})(1-\bar{P})(Z_{\beta}+Z_{\alpha/2})^2}{(P_1-P_2)^2}$$

After adding 10% for non-response rate 93 cases and 186 controls (a total sample size of 279) planned to be involved in the study.

6.6 Sampling technique and procedure

Four public hospitals (Petros, Yekatit 12,Gandhi and Tirunesh Beijing hospitals) are selected by lottery method from twelve public hospitals in A.A. proportional allocation is made for each hospital by fixing one month average delivery flow, 1600 of which 122 were cases and 1478 were controls. Then cases are selected by consquetive sampling. For each case two controls that fulfill the inclusion criteria will be sampled systematically from delivery of the same hospitals from which cases are drawn. The weight of all live term singleton newborns with mothers delivered in those selected hospitals during the study period will be measured. Based on the case definition those live term newborns births weight less than 2500g included in the study as cases. ANC and Birth cards during the data collection period will be identified in addition to mother's face to face interview, and check for completeness of the necessary information.

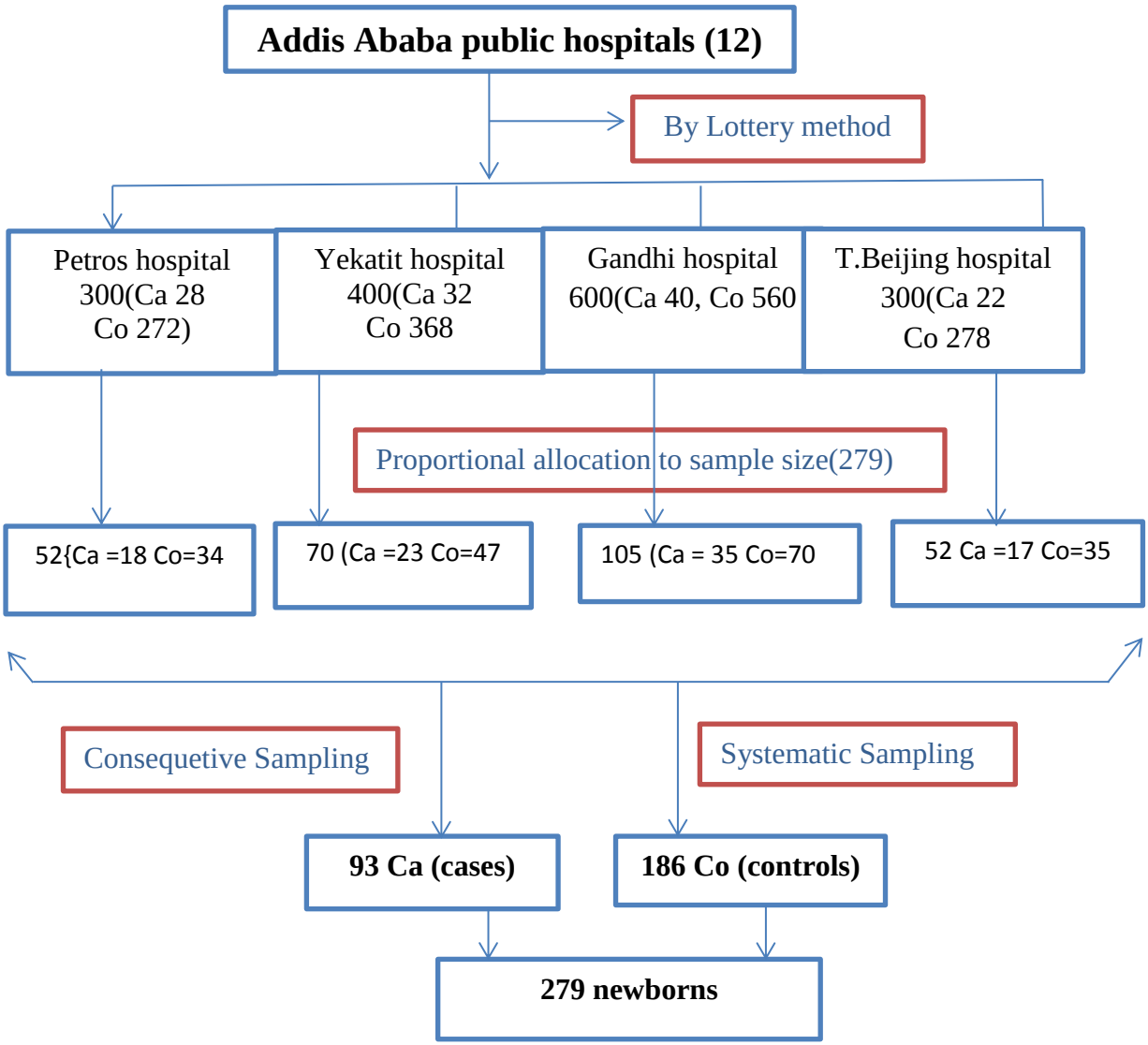

Figure 2 Architecture of sampling procedure on determinants of LBW among newborns delivered in Addis Ababa public hospitals 2018/2019

6.7 Variables of the study

6.7.2 Dependent variable

Low Birthweight

6.7.2 Independent variables

Socio-demographic factors:

- maternal age, - Marital status,
- Religion, - Ethnicity,
- Drinking alcohol during pregnancy - height of the mother
- Weight of mother, -Education
- Occupation status of the mother, - Monthly income of the family.

Obstetric factors:

- Gestational age, - Parity,
- Utilization ANC, -Hemoglobin level
- Reported illness during pregnancy, - History of abortion,
- PROM, - APH,
- STI, - Gravidity,
- History of prenatal iron supplementation,

Nutritional factors:

- Maternal MUAC,
- Exposure to nutrition counseling during the pregnancy,
- Maternal BMI,
- Frequency of additional meal intake during current pregnancy

Neonatal factors:

- Infant's sex,
- GA, and birth-to-birth interval

6.8 Operational Definition and definition of terms

Newborn babies: babies age from birth to 24 hour postpartum

Normal birth weight: The newborn infant weight greater than 2500 grams and < 4000 gm**.**

Low birth weight: neonate birth weight less than 2,500 gm (7).

Preterm birth: birth before a gestational age of 37 complete weeks (35).

Multiple births: more than one fetus is carried to term in a single pregnancy(35).

Maternal morbidity: morbidity during pregnancy attributed or aggravated by pregnancy and childbirth (52)

Birth interval: the period from the current date of conception to the date of birth of the previous baby(47).

Gestational hypertension: Hypertension induced by pregnancy after the 20th week of pregnancy

Gravida: number of pregnancy

Para: number of births live or not

6.9 Data Collection tools and procedures

The data will be collected by interviewing the mothers, reviewing medical records and measuring the anthropometry of the mothers and the newborns using structured and pretested questionnaire. The interview and anthropometric measurements will be conducted by trained midwives and nurses working in the delivery wards of the four public hospitals .The questionnaire will first be prepared in English language and translated to Amharic language and back to English to check for language consistency.

The questionnaire was adopted from Ethiopian demographic health survey (EDHS) and other peer reviewed articles(14, 53, 54) (3).

The socio demographic and obstetric factors part of the questionnaire will be obtained from the ANC records. Questions in the third section will be related to nutritional factors , maternal MUAC, exposure to nutrition counseling during the pregnancy, and neonatal factors like infant's sex. The weight of the newborns will be measured within 1 hour after birth using a balanced Seca scale and rounded to the nearest 100 g. The scale will be checked and zeroed before weighing each newborn. Eligible mothers will be interviewed face to face within 24 h after delivery.

Maternal height will be measured against a wall height scale to the nearest centimeter. Maternal body mass index (BMI) will subsequently be calculated. Maternal MUAC will be measured by MUAC tape and rounded to the nearest 0.1cm. All information will be collected on a data collection sheet designed for the study.

6.10 Data Quality control measures

The questionnaire will be evaluated by experts in related fields. The data collection instrument will be pre-tested on 5% of the sample size in Black Lion referral hospital to avoid information contamination. Pre-test will be used to check for language clarity, appropriateness of data collection tools, estimate time required and the necessary amendments will be considered. Training will be given concerning the data abstraction tool and data collection process for both data collectors and supervisors. During the data collection time, close supervision will be carried out by supervisors and investigator to ensure the quality of the data. Finally, all the collected data will also be checked by supervisor and investigator for its completeness and consistency. Consistency will be examined through random selection of questionnaire. Double data entry will be also done.

6.11. Data processing and analysis

Before analysis, data will be cleaned, edited and coded. Any errors identified at this time will be corrected after review of the original data using the code numbers. Data will be entered using Epi-Data version 4.2 and analyzed using SPSS 21 statistical software. Based on the nature of variables frequency distribution, summary statistics such as mean and standard deviation will be computed for cases and controls groups. Multi-collinearity will be checked. Regression model assumption will also be checked using goodness of fit test like Hosmer lemeshow to identify and exclude variables that cause poor fit in the model. Bivariate regression model will be fitted for each explanatory variable. Accordingly, those variables having p-value less than or equal to 0.25 in the bivariate analysis will be fitted to the multivariable logistic regression model. In multivariable regression P-value less than 0.05 will be considered as statistically significant.

7. ETHICAL CONSIDERATIONS

Ethical clearance will be obtained from the Addis Ababa University Department of Nursing and Midwifery, research ethical review boards. Further permission will be obtained from Petros, Yekatit 12 hospital, Gandhi memorial and Tirunesh Beijing hospital and the department head of each obstetric ward. Data collectors will explain the objective, benefit and risks of the study to the study participants to get informed consent prior to data collection. Respondents will be informed they have the right to refuse or decline from the study at any time if they wish so. Study participants will also be explained for the attainment of confidentiality and the information they give will not contain their name or any identifiers and will not be used for any purpose other than the study.

8. DISSEMINATION OF THE RESULT

The result of the study will be submitted and presented to Addis Ababa University, School of Nursing and midwifery, Department of Nursing and Midwifery as a partial fulfillment of masters in pediatric and child health nursing. The study result will also be submitted to Petros, Yekatit 12 hospital, Gandhi memorial and Tirunesh Beijing hospital. The finding will also be presented in locally or internationally held seminars, workshops, conferences and meetings. Attempt will be made to publish the paper in internationally or nationally recognized peer reviewed journal.

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10. ANNEX 1

10. 1. Work plan

Table 1: Giant chart showing the work plan of the study

	Activities	Responsible person	Time Period, 2018/19									
			Spt	Oct	Nov	Dec	Jan	Feb	Mar	Api	May	Jun
1.	Topic selection	PI										
2.	Topic defense	PI										
3.	Proposal writing	PI& Advisors										
4.	Proposal defense	PI										
5.	Submission of proposal	PI										
6.	Training of DC and SP	PI & DC & SP										
7.	Data collection	PI, DC & SP										
8.	Data entry & analysis	PI										
9.	Thesis writing up	PI&Advisors										
10.	Submission of first draft & Mock defense	PI										
11.	Submission of first final paper	PI										
12.	Thesis defense	PI										
13.	Final thesis submission	PI										

KEY: PI=principal investigator, DC=data collectors, SP = supervisors

10.2 Budget plan

Table 2. Shows budget breakdown for personal, stationary and logistic for the project

For Training					
Title	No.of participant	Qualification	No.of days	Cost	To tal
Data collectors	9	BSc	2	200	3600
Supervisor	3	BSc	2	300	1800
Total					5400
For Data Collection					
Data collectors	9	BSc	20	100	18000
Supervisor	3	BSc	20	100	6000
Total					24000

Stationary and logistics			
Item	Quantity	Unit Price	Total
Questionnaire duplication	(4x302) pages	1	1208birr
Print (proposal &thesis)	6 copies (45pages)	3.00	810
Paper	4 reams.	200.00	800
Pen	10	5.00	50
Pencil	12	1.00	12
Eraser	10	4.00	40
Note pad	6	15.00	80
Mobile card	6	50	300
Sub total			3300

Budget Summary

Item	Total Cost
Personnel cost	29400
Stationary & mobile card	3300
Sub-total	32700
Contingency 10%	3270
Total Cost of the Project	35970 birr

10.3 Information sheet

Title of the Research Project: To assess Determinants of Low Birth Weight among newborns delivered at Addis Ababa public Hospitals: A case control study, Addis Ababa, Ethiopia, 2018/19

Name of Investigator: Getaneh Baye (Bsc in Nursing)

Name of the Organization: Addis Ababa University, College of health science, School of Nursing and Midwifery, Department of nursing and midwifery.

Name of the Sponsor: Addis Ababa University.

Introduction: This Questionnaire is prepared for Petros, Yekatit 12, Gandhi memorial and Tirunesh Beijing hospitals administration and delivery coordinating office. The aim of the form is to make the above-concerned office clear about the purpose of research, data collection procedures and get permission to conduct the research.

Purpose of the Research Project: To assess Determinants of Low Birth Weight among newborns delivered at Addis Ababa public Hospitals: Case control study, Addis Ababa, Ethiopia, 2018/19

Procedure: In order to achieve the above objective, information necessary for the study will be taken from mothers delivered in hospital.

Risk and /or Discomfort:

Since the study will be conducted by taking appropriate information from mothers, ANC and birth cards, it will not inflict any harm on the patients. The name or any other identifying information will not be recorded on the questionnaire and all information is taken from the chart will be kept strictly confidential and in a safe place. The information retrieved will only be used for the study purpose.

Benefits: the research have no direct benefit for mothers who give birth in public hospitals. But the indirect benefit of the research for the participant and other clients in the program is clear.

This is because if program planners are preparing predicted plan there is a benefit for clients in the program of getting appropriate care and treatment services for those mothers and newborns. In all, the research work has a paramount direct benefit for health care planners and managers.

Confidentiality: To reassure confidentiality the data on the chart will be collected without the name of the clients and the information collected from this research project will be kept confidential and will be stored in a file cabinet. In addition, it will not be revealed to anyone except the investigator and it will be kept in a key and locked system with computer pass ward.

Person to contact: This research project will be reviewed and approved by the institutional review board of College of Health Science, school of Nursing and Midwifery, Addis Ababa University. If you have any question you can contact any of the following individuals (Investigator and Advisors) and you may ask at any time you want.

Getaneh Baye, Addis Ababa University College of Health Sciences, School of Nursing and Midwifery Department of nursing and midwifery: principal investigator

Cell phone @251-920633075, E-mail: getanehbaye6@gmail.com

Bereket Gebremichael (MSC, Ass't professor) and Kalkidan wondwossen (MSc) Addis Ababa University College of Health Sciences, School of Nursing and Midwifery Department of nursing and midwifery Advisor

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Cell phone +251913634088 Email:kalkidan.wd@gmail.com

Annex 10.4-Data collection tools

This questionnaire is prepared for the collection of socio-demographic, obstetric, nutritional, and other information that are important for the assessment of low birth weight and its determinants among term neonates at public hospitals in Addis Ababa. All this information will be retrieved from the delivery mothers, ANC registration book and birth card without mentioning the name of the clients from March to April, 2019. This information will be collected by health care providers possibly working in the delivery room of the selected hospitals.

Table 3: Questionnaire to assess determinants of low birth weight among newborns delivered in Addis Ababa public hospitals from March to April Addis Ababa, Ethiopia, 2019ANNEX-I QUESTIONNAIRES AND CHECKLIST FOR DATA COLLECTION

Addis Ababa University

College of Health Sciences

School of Nursing and Midwifery

Department of Nursing and Midwifery

Interviewer's Name: _____ Code: _____ Signature: _____

Supervisor's Name: _____ Code: _____ Signature: _____

Date: _____

INFORMATION SHEET

Greetings! My name is _____. I am here representing a team to conduct data collection among mothers card that gave birth to a live baby (either low birth weight or normal birth weight) about the risk factors associated with low birth Weight.

Low birth weight is defined as birth weight less than 2,500 grams. More than 20 million infants are born each year weighing less than 2500 g, accounting for 17% of all births in the developing world. Similarly, according to Ethiopian DHS 2016 10% weighed less than 2.5 kilograms. Birth weight plays an important role in infant mortality and morbidity, development, and future health of the child. Weight at birth is directly influenced by general level of health status of the mother.

The main objective of the study is to identify the determinant factors associated with low birth weight in Addis Ababa public hospitals. The data collection is supposed to get administered within this facility from medical records and interviewing delivered mother.

For more details: Contact Getaneh Baye (Principal investigator) with +251-920633075

Checklist and Questionnaire for data collection on determinant factors associated with low birth weight Neonates in Addis Ababa public hospitals.

Note the Exclusion criteria from clinical records:

- ✓ Is the child is preterm 1:YES 2: NO
- ✓ Is the child born single 1: YES 2: NO
- ✓ Is the child free of any visible major birth defect 1: YES 2: NO
- ✓ Birth weight > 4000 g 1: YES 2: NO

If ―Yes to any of the exclusion criteria, stop the collection of data.

Name of the hospital		_____		
Status		1. **Case** 2. **Control**		
Measurement				
S.No	Coding categories	Questions and filter	Skip	Code
101	Neonatal birth weight in grams?	In gm:_____		
102	Sex of the newborn?	Male ____1 Female ___2		
103	Gestational age (GA)	_____wks		
104	Height of woman	Height in cm____		
105	MUAC (Take left hand if right-handed, and right hand if left- handed)	By cm……		
106	Maternal BMI (Kg/m^2)	(Kg/m^2)_____		
Section II. Socio demographic characteristics of mother				
201	Age at your last birth day?	Age in completed years:___		
202	Religion	1 orthodox 2 muslim 3 protestant 4 catholic 5. Other		
203	Ethnicity	1. Amhara 2. Oromo 3. Tigre 4.Gurage 5. Other		
205	Marital status	1 married 2. separated 3 single 4 widowed		
206	Maternal education	1. Illiterate 2. Primary (1–8) 3.Secondary 4.higher		
207	Maternal occupation	1 house wife 2 merchant 3 gov.t employee 4. Private 5. Other….		
208	Monthly Income	_____ Birr/ month		
Section III. Obstetric history				
301	Total number of pregnancy	number:_____		

302	Total number of births?	number: _____	If,gravida I to 304	
303	Birth-to-birth interval by month	1. <24 months 2. >24 months		
304	Have you ever had an abortion?	1. Yes		
		2. No	401	
305	How many abortions did you have?	Number of abortions:___		

Extraction checklist

Section IV. Current pregnancy history
If the mother had ANC follow-up, fill the required data from the ANC card when available

s.no	Coding categories	Questions and filter	Skip	Code
402	How did you give birth? That is mode of delivery.	Vaginal delivery----------1		
		Assisted delivery--------2		
		Cesarean section----------3		
403	Have you ever weighed prior your pregnancy (recent one) or Prior 12 gestational weeks of your current pregnancy?	1. Yes		
		2. No	405	
		3. Do not remember	405	
404	If yes what was your weight in kg?	Weight of the mothers:___		
		Do not remember ---------3		

405	Have you ever been weighed in Your current third trimester pregnancy?	1. Yes				
		2. No			407	
		3. Do not remember			407	
406	What was your weight in the last Weight measurement taken?	Weight of the mothers:___				
		Do not remember --------3				
407	Have you visited health facility for ANC for current pregnancy?	1. Yes				
		2. No			413	
408	At what months of the current pregnancy you started ANC?	1. At _____ months 2. Don't know/not sure				
409	How many times did you receive antenatal care during your current pregnancy?	Number of visits: _____				
410	As part of your antenatal care during this pregnancy, were any of the following done at least once? Was your weight measured? Was your BP	Service	YES	NO		
		Weight	1	2		
		BP	1	2		

	measured? Did you give a urine sample? Did you give a blood sample?	URINE	1	2		
		BLOOD	1	2		
s.no	Coding categories	Questions and filter			Skip	Code
411	During (any of) your antenatal care visit(s), were you told about the Signs of pregnancy complications?	1. Yes				
		2. No			414	
		3. Do not remember			414	
412	Which signs of pregnancy Complications were you told about?		YES	NO		
		Vaginal bleeding	1	2		
		Vaginal gush of Fluid	1	2		
		Severe head ache	1	2		
		Blurred vision	1	2		
		Fever	1	2		
		Abdominal pain	1	2		
		Other (specify)…..				
413	During this pregnancy, were you given or did you buy any iron tablets?	1. Yes				
		2. No			416	
		3. Do not remember			416	
414	During the whole pregnancy, for how many days did you take the tablets?	No of Days:_____				

415	Have you ever been told that you have chronic hypertension?	1. Yes 2. No		
416	During this pregnancy, have you been told that you have developed Pregnancy induced hypertension?	1. Yes 2. No		
417	During your current pregnancy, have you been told that you have anemia?	1. Yes 2. No		
418	What was her hemoglobin level on her current pregnancy, if available?	---------g/dl		
419	Have you ever been told that you have Diabetes Mellitus?	1. Yes 2. No		
420	During this pregnancy, did you have any history of vaginal bleeding prior to the onset of labor or delivery?	1. Yes 2. No		
Section V. Maternal nutritional status				
501	Have you get nutritional counseling during current pregnancy	1. Yes 2. No		
502	Were you take additional meals during current pregnancy	1. Yes		
		2. No	504	
503	additional meals during current	1. One times.		

	pregnancy	2. Two times and above 3. No additional meals		
504	During your pregnancy, did you take drinks containing alcohol?	Yes ----------1 No ----------2	 503	
505	How often were you taking alcohol drinks?	1. Daily 2. 3 times per week 3. 1 times per week 4. Once a month		
506	How often were you chewing khat?	1. Daily 2. 3 times per wk 3. 1 times per wk 4. Once a month		
507	During your current pregnancy, did you ever Smoke?	1. Yes 2. No		
508	If 507 yes, how often were you smoking?	1. Daily 2. 3 times per wk 3. 1 times per wk 4. Once a month		

የፍቃደኝነት ማረጋገጫ ቅፅ

አዲስ አበባ ዩኒቨርሲቲ ፣ ጤና ሳይንስ ኮሌጅ

የነርሲንግ እና ሚድዋይፈሪ ትምህርት ቤት

የነርሲንግ እና ሚድዋይፈሪ ትምህርት ክፍል

በአዲስ አበባ ከተማ ሆስፒታል ክብደታቸው ከትክክለኛው (2.5 ኪ.ግ) በታች ሆነዉ የሚወለዱ ህጻናትና የሚያጋልጡ ተዛማጅ ምክንያቶችን ከመጋቢት እስከ ሚያዚያ 2011 ዓ.ም ለማጥናት የተዘጋጀ አማርኛ መጠይቅ

መግቢያ

ጤና ይስጥልኝ ! ዉድ ተሳታፊዎች ይህ መጠይቅ የተዘጋጀዉ በአዲስ አበባ ዩኒቨርሲቲ የነርሲንግ እና ሚድዋይፈሪ ትምህርት ክፍል የ2ኛ አመት የህፃናት ህክምና እና ህፃናት ጤና ተመራቂ ማስተርስ ተማሪ በሆኑት በአቶ ጌታነህ ባየ ሲሆን ጥናቱም በአዲስ አበባ ከተማ በሚገኙ ጤና ተቁዋማት ክብደታቸው ከትክክለኛው(2.5 ኪ.ግ) በታች ሆነዉ የሚወለዱ ህጻናትና የሚያጋልጡ ተዛማጅ ምክንያቶችን ከመጋቢት 1 እስከ ሚያዚያ 1 2011 ዓ.ም ለማጥናት ነው፡፡

በዚህ ጥናት ላይ በመሳተፍዎም ሆነ መጠይቁን በመመለስዎ የተዘጋጀ ክፍያ የለም ነገር ግን ከዚህ ጥናት የሚገኘው መረጃ ለጨቅላ ህፃናት ጤና ደህንነት እና እንክብካቤ ለመስጠት እንዲሁም ልዩ ትኩረት ለመስጠት እና ለችግሩ የመፍትሄ እርምጃ መዉሰድ ለሚሹ ህጋዊ አካላት ትልቅ አስተዋጽኦ አለዉ፡፡ በመጠይቁ ላይ ስምዎትን አይጠየቁም ፡፡ እንዲሁም መልሶቻችሁ በምስጢር ስለሚያዙ በምንም አይነት መንገድ ጉዳዩ ለማይመለከታቸዉ አካላት አይገለጽም በዚህ ጥናት በመሳተፍወ በልጅወ ወይም በእርስወ ላይ የሚደርስ ጉዳት የለም፡፡ የእርስዎ በዚህ ጥናት ላይ መሳተፍ በፍላጎትዎ ላይ የተመሰረተ ነው፡፡

መጠይቁን ሙሉ ለሙሉ ያለመሙላት ወይንም የማቋረጥ መብትዎም የተጠበቀ ነዉ፡፡

በጥናቱ ዉስጥ ለመሳተፍ ፈቃደኛ ነዎት? 1. አዎ ፊርማ _____ ቀን _____

የመጠይቁ ሰብሳቢ ፊርማ_____ ቀን _____

2. አይደለሁም ---- እባክዎን እዚህ ጋር ይቁሙ

በጥናቱ ዉስጥ ለመሳተፍ ፈቃደኛ ከሆኑ ትክክለኛ የሆነ መልስ እንዲሰጡን በትህትና እንጠይቃለን፡፡

ስለትብብርዎ በቅድሚያ እናመሰግናለን !! !

9.4 አማርኛ መጠይቅ

የመረጃ ሰብሳቢዉ ስም: ----------ቀን: ----------

የመረጃ ሰብሳቢዉ ስምምነት

'መረጃዎቹን በመመሪያዎቹና በሰለጠንኩት ስልጠና መሰረት መሙላቴን እና ትክክለኛነታቸዉን አረጋግጣለሁ::

ፊርማ---------- ቀን----------

የሆስፒታሉ ስም: ----------የተቆጣጣሪው ስም----------ፊርማ----------

መጠይቁን ለመቀጠል መጀመሪያ : ✓ ህጻኑ ከመውለጃ ጊዜ ቀድሞ ነው 1:አወ 2: አይደለም ✓ የተወለዱት መንታ ህጻን ናቸው 1:አወ 2: አይደለም ✓ በአይን የሚታይ ተፈጥሯዊ ችግር አለው 1:አወ 2: አይደለም ✓ የህጻኑ ክብደት ከ 4.00 ኪ.ግ በላይ ነው 1:አወ 2: አይደለም ከተጠየቁት መስፈርቶች አንዱ አወ ከሆነ ,እዚህ ላይ ያቁሙ.				
የሆስፒታሉ ስም		_____		
ሁኔታ		1. ኬዝ 2. ኮንትሮል		
አካላዊ ልኬት				
ተ.ቁ	መለያ	ጥያቄ እና ማጣራት	እለፍ	ኮድ
101	የህፃኑ ክብደት ?	----------ግራም		
102	የህጻኑ ጾታ?	1. ወንድ 2. ሴት		
103	የእርግዝናጊዜ	በሳምንት ___		
104	የእናትዮዋ ቁመት	በሳ.ሜትር____		
105	የእናትየዋ የክንድ ልኬት	በሳ.ሜትር____		
106	የእናትየዋ ክብደት ለመጠነ ቁመት ሲካፈል	---------- ኪ.ግ/ሜ^2		
ክፍል 2: የእናት ግላዊና ማህበራዊ ገጽታ				
201	እድሜሽ ስንት ነዉ?	----------		
202	ሃይማኖት?	1. ሙስሊም 2. ኦርቶዶክስ 3. ፕሮቴስታንት 4. ሌላ ካለ ይጠቀስ----		
203	ብሄር?	1. አማራ 2. ትግሬ 3. ኦሮሞ 4. . ሌላ ካለ ይጠቀስ----		
205	የትዳር ሁኔታ	1 ያገባች 2. የተፋታች 3 ግላዊ/ብቸኛ 4 የሞተባት		
206	የትምህርት ደረጃሽ ?	1. ምንም ያልተማሩ 2. .የመጀመሪያ ደረጃ 3.ሁለተኛ ደረጃ 4. ከፍተኛ ትምህርት		
207	የእናትየዋ የስራ ደረጃ/አይነት	1 የቤት እመቤት 2 ነጋዴ 3 የመንግስት ሰራተኛ 4. ሌላ ካለ ይጠቀስ---		
208	**ወርሃዊ ገቢያችሁ ስንት ይሆናል?**	1. _____ **ብር/ ወር**		
ክፍል 3: ስለ እናትየዋ የጽንስ እና ማህጸን ሁኔታዎች				
301	ስንተኛ እርግዝናሽ ነው?	በቁጥር:_____		
302	ስንት ልጆች ወልደሻል? ሁሉም ከ 28 ሳምንት በኑላ በህይዎት የተወለዱ ወይም የሞቱ.	በቁጥር_____	እርግዝናው የመጀመሪያ	

			ከሆነ 304	
303	አሁን በተወለደው ልጅሽና በፊት በወለድሽው መካከል ያለው የእደሜ ልዩነት	1. ከ24 ወር በታች 2. ከ24 ወር በላይ		
304	የ ጽንስ ማቋረጥ ኣጋጥሞሽ ያውቃል?	1. አወ 2. የለም		
			401	
305	ስንት ጊዜ ጽንስ ማቻረጥ ኣጋጠመሽ?	በቁጥር:___		

ቸክ ሊስት

ክፍል 4. ያሁኑ የእርግዝና ሁኔታ

የነፍሰጡር ክትትልን መሰረት በማድረግ ከካርድ ላይ የሚሞላ

			እለፍ	ኮድ
401	በምን ወለድሽ?	በምጥ---1 በመሳሪያ የታገዘ----2 በቀዶ ህክምና---3		
402	ከሶስት ወር የርግዝና ጊዜ በፊት ክብደትሽን ተመዝነሽ ነበር ?	አወ--------1 የለም----2		
			406	
403	መልሶ አወ ከሆነ ክብደትወ በኪ.ግ	ኪ.ግ:___		

404	ከስድስት ወር የርግዝና ጊዜ በኑላ ክብደትሽን ተመዝነሽ ነበር?	1. አወ 2. የለም				
					408	
405	መልሶ አወ ከሆነ ክብደትወ ስንት ነበር?	በኪ.ግ:__				
406	በእርግዝናሽ ወቅት የጽንስ ክትትል አድርገሽ ነበር?	1. አወ				
		2. የለም			412	
407	ለ408 ጥያቄ መልስሽ አዎ ከሆነ በስንተኛ ወርሽ ላይ ነው ክትትል የጀመርሽው?	1_____ ወር 2----------አላስታውስም				
408	በአጠቃላይ ስንት ክትትል ነበረሽ?	በቁጥር: _____				
49	በጽንስ ክትትል ወቅት, እነዚህን አገልግሎቶች አግኝተሻል	አገልግሎት	አወ	አላገኘሁም		
		ክብደት መለካት	1	2		
		የደም ግፊት መጠን	1	2		
		የሽንት ምርመራ	1	2		
		የደም ምርመራ	1	2		
ተ.ቁ	መለያ	ጥያቄ እና ማጣራት			እለፍ	ኮድ
410	በአሁኑ እርግዝናሽ ያጋጠመሽ አጠቃላይ የጤና እክል ነበር?	አወ----------1				
		የለም- ----2			414	
411	መልስሽ አወ ከሆነ ምን አይነት የጤና ችግር ነበር?		አወ	አልገጠመኝም		
		በብልት የሚፈስ ደም	1	2		
		በብልት የሚፈስ ፈሳሽ	1	2		
		ከፍተኛ የራስ ምታት	1	2		
		ብዥ'ታ	1	2		

		ትኩሳት	1	2		
		የሆድ ህመም	1	2		
		ሌላ ካለ ይጠቀስ---				
412	በእርግዝናሽ ወቅት ለደም ማነስ የአይረን ፎስፌት እንክብሎች ወስደሽ ነበር?	1. አዎ				
		2. የለም			416	
413	414ኛው ጥያቄ መልስዎ አዎ ከሆነ ለምን ያህል ቀን እንክብሎችን ወስደሻል?	የቀን ብዛት :_____				
		አላስታውስም--------2				
414	ለረጅም ጊዜ የቆየ የደም ግፊት እንዳለብሽ ተነግሮሻል?	1. አዎ 2. የለም				
415	ባሁኑ እርግዝናሽ ከእርግዝናጋር የተያያዘ የደም ግፊት እነዳለብሽ ተነግሮሻል?	አዎ----------1 የለም---- 2				
416	በእርግዝና ወቅት የደም ማነስ እነዳለብሽ ተነግሮሻል?	አዎ----------1 የለም---- 2				
417	በእርግዝና ወቅት የደም ልኬት መጠን	_____g/dl				
418	የስኳር በሽታ እነዳለብሽ ተነግሮሻል??	አዎ----------1 የለም---------- 2				
419	ምጥ ከመምታቱ በፊት በብልት የደም መፍሰስ አጋጥሞሽ ነበር ?	አዎ----------1 የለም---------- 2				
ክፍል 5፡የእናት የአመጋገብ ሁኔታን በተመለከተ						
501	በጽንስ ክትትልሽ ወቅት ስለ አመጋገብሽ ምክር ተሰጥቶሽ ነበር?	አዎ----------1 የለም----------2				
502	በአሁኑ እርግዝናሽ ጊዜ ከእስካሁኑ አመጋገብሽ ተጨማሪ ምግብ ተመግበሻል?	አዎ----------1 የለም----------2				
503	በቀን ስንት ጊዜ ተጨማሪ ምግብ ተመግበሻል?	አንድ ጊ-----ነ ሁለትና ከዚያ በላይ---2				
504	በእርግዝናሽ ወቅት አልኮል ትጠጭ ነበር?	1. አዎ 2. የለም				
505	504 መልሶ አዎ ከሆነ ምን ያክል ጊዜ ትጠጭ ነበር?	1. በየቀኑ 2. በሳምንት 3 ጊዜ 3. በሳምንት ነ ጊዜ 4. በወር ነ ጊዜ				
506	በእርግዝናሽ ወቅት ጫት ትቅሚ ነበር?	አዎ-----1 የለም----2				
507	በእርግዝናሽ ወቅት ሲጋራ ታጨሽ ነበር?	አዎ-----1 የለ ም----2				
508	507 አዎ ከሆነ ምን ያክል ጊዜ ታጨሻለሽ?	ነ. በየቀኑ 2. በሳምንት 3 ጊዜ 3. በሳምንት 1 ጊዜ 4. በወር 1 ጊዜ				

APPROVAL SHEET

ADDS ABABA UNIVERSITY

COLLEGE OF HEALTH SCIENCE

SCHOOL OF NURSING AND MIDWIFERY

DEPARTMENT OF NURSING AND MIDWIFERY

I, the undersigned MSc student, declare that I have submitted my original work on a title Determinants of Low Birth Weight among newborns delivered at Addis Ababa public Hospitals: A case control study Addis Ababa, Ethiopia for the examination.

Submitted by:

Getaneh Baye _____ _____

Signature Date

This proposal work has been submitted for examination with my approval as an advisor.

Approved by:

1. Bereket Gebremichael _____ _____

Signature Date

2. Kalkidan Wondwossen _____ _____

Signature Date

Examiner: _____ _____

1. Roza Teshome Signature Date