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PREVALENCE AND ASSOCIATED FACTOR OF LOW BIRTH WEIGHT AMONG NEW BORN WITH MOTHERS IN TIBEBE GEON AND FELEGE HIWOT SPECIALIZED HOSPITALS, NORTH WEST ETHIOPIA 2020.

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BAHIR DAR UNIVERSITY

INSTITUTION OF TECHNOLOGY

SCHOOL OF CHEMICAL AND FOOD ENGINEERING

DEPARTMENT OF APPLIED HUMAN NUTRITION

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MISRAK LEYKUN BERHANU

A Thesis Submitted to the School of Research and Postgraduate Studies, Bahir Dar Institute of Technology, Bahir Dar University, in Partial Fulfillment of the Requirements for the Degree of Master of Science in Applied Human Nutrition

Advisor

1. **Dr.Netsanet Fentahun (MPH, Double PhD, Associate Professor)**

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Bahir Dar Ethiopia

DECLARATION

I, the undersigned, declare that the thesis comprises my own work. In compliance with internationally accepted practices, I have acknowledged and refereed all materials used in this Work. I understand that non-adherence to the principles of academic honesty and integrity, Misrepresentation/ fabrication of any idea/data/fact/source will constitute sufficient ground for disciplinary action by the University and can also evoke penal action from the sources which have not been properly cited or acknowledged.

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Date of submission: _____

Place: Bahir Dar, Ethiopia

This thesis has been submitted for examination with my approval as a university advisor.

Advisor's Name: _____

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FACULTY OF CHEMICAL AND FOOD ENGINEERING

We, the undersigned, members of the Board of Examiners of the final open defense by Mistak Leykun have read and evaluate His/her thesis\entitled "prevalence and associated Factor of low birthweight among newborn And examined the candidate. This is, therefore, to certify that the thesis has been accepted In partial fulfillment of the requirements for the Degree of Master of Science in Applied Human Nutrition.

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ABSTRACT

Background: Low birth weight is one of the public health problems in the globe and it is an indicator of the health of the new born and the mother. Low birth weight newborn have a greater risk of illness or death, need especial care, instrument trained health personal, prolonged hospitalization, There is limited study on prevalence and associated factors of low birth weight in Tibebe Geon and Felege hiwot specialized hospitals so this study fill this gap and give base line information for Amhara region health Bureau and researchers.

Objective: To assess prevalence and associated factors of low birth weight among new born with mother in Tibebe Geon and Felege Hiwot Specialized Hospitals.in2020.

Method: A facility based cross-sectional study was conducted from January/1/2020 to February 31/2020 Total of 237 mothers were selected using systematic random sampling. Data were collected by using interviewer administered quantitative structured questionnaire and medical records. Data were checked for completeness, coded, and entered using Epi-Info version 7 and export to SPSS version 23 for analysis. In bivariate analysis if the variables p-value was less than 0.25 was entered into multivariable logistic regression model. In multivariable logistic regression analysis the variables which p-value became less than 0.05 were significantly associated used to determined associations between dependent and independent variables.

Result: The prevalence of low birth weight was 12.7%. Maternal residence (rural) AOR= 3.2; 95% CI (1.3-9.7), mothers educational status (primary education) AOR= 3.3; 95% CI (1.2-9.3) and unable to read and write AOR= 8.9; 95% CI (1.7-48.0), sex of new born (male) AOR 2.7 (95% CI: 1.1- 6.5) were significantly associated with low birth weight.

Conclusion: the prevalence of low birth weight was in line with study in Deber tabor hospital in the study area maternal residence maternal education and sex of the new born were independently associated with low birth weight.

Recommendation Community awareness creation on rural residence about maternal nutrition and maternal education level by improving education access in rural residence is recommend to prevent low birth weight

Key terms: prevalence of low birth weight, associated factor of low birth weight, low birth weight, determinant factor of low birth weight.

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ABREVIATIONS

ANC = Antenatal care

BMI = Body Mass Index

EDHS = Ethiopian Demographic & Health Survey

FHSH = Felege Hiwot Specialized Hospital

Gm. = gram

HAART-Highly Active Antiretroviral Treatment

HIV = Human Immunodeficiency Virus

LBW = Low birth weight

MUAC = mid upper arm circumference

PI = principal investigator

PIH = pregnancy induced hypertension

PTB - preterm birth

TGSH= Tibebe Geon Specialized Hospital

UNICEF= United nation children's fund

WHO = world health organization

1. INTRODUCTION

1.1. Background

World Health Organization(WHO) defined low birth weight as the weight of an infant at birth of less than 2,500 grams Subcategories include Very Low Birth Weight (VLBW) which is less than 1500 gram, and Extremely Low Birth Weight (ELBW) which is less than 1000gram (Organization & Unicef, 2004). LBW is one of the main causes of infant mortality including around 40% of all death among children under 5 years old which occurs in neonatal or newborn, the mortality rate of LBW (Low Birth Weight) is approximately twenty times more than normal birth weight totally, about 15.5% of all birth is LBW while 95.6% of it occurs in developing countries(W. G. N. Targets, 2014)

The World Health Assembly (WHA) from six global nutrition targets the third target is 30% reduction of low birth weight, the goal is the reduction of LBW from 20 million to 14 million infants with low weight at birth per year this is achieving the Millennium Development Goal (MDG) for reducing child mortality **(Organization, 2014b)**

The risk of some diseases such as coronary diseases, stroke, hypertension, and diabetes are higher in adults with a history of LBW than normal birth weight (NBW). Cause of low birth weight are preterm birth and growth restriction (W. W. G. N. Targets, 2014). Preterm births are births before 37 weeks of gestational age and less than 2500gm body weight. Prematurity are more common in developed countries (Blencowe et al., 2013). The second is small for age or term births are birth from complete 37 week to 42weeks of gestational ages and birth weight less than 2500gm intrauterine growth retardation (IUGR) (Lee et al., 2013).

The determinants of LBW can be broadly classified as obstetric, nutritional, related to maternal morbidities in the antenatal period, toxic exposure-related, and linked to antenatal care (ANC). Other factors including , maternal age, birth spacing, ANC, anemia, maternal ills health, and stress have also been reported (Mahumud, Sultana, & Sarker, 2017). Associated factors of low birth weight include maternal under nutrition and vitamin and mineral deficiencies (like copper, Zink and iron) , which is a result preterm maternal disease and infections , present of urinary tract infection which is a result for preterm birth was occur frequently in pregnant mothers (Demilie, Beyene, Melaku, & Tsegaye, 2012).

Identifying determinates of LBW and preventing them helps in reducing early child hood morbidity and mortality(Abass et al., 2014) Decisions (managements) about which infants will be considered candidates for resuscitation and intensive care are generally based on the anticipated gestational age at birth(Eichenwald & Stark, 2008). Preventing of low birth weight is an important intervention to reduce neonatal death. Therefore, maximizing women economic status, providing quality family planning services, enabling pregnant women to use antenatal care is highly recommend(A. Alemu, Abageda, Assefa, & Melaku, 2019).

1.2. Statement of the problem

The global prevalence of LBW(Low Birth Weight) is 15.5% which means that more than 20 million such infants are born each year from 130 million annual births (Organization & Unicef, 2004) Low birth weight continues to be a significant public health problem globally and is associated with a range of both short- and long-term consequences. Overall, it is estimated that 15% to 20% of all births worldwide are low birth weight.(Organization, 2014a) In Africa 14 .3% were low birth weight, in Nigeria the prevalence of low birth weight was 6.3%(Oladeinde, Oladeinde, Omoregie, & Onifade, 2015) . Determinant of low birth weight (birth weight less than 2500gm) has many problems starting from birth time, LBW(Low Birth Weight) increase labor abnormality infants being born by cesarean (1.4 times) or vaginally in breech presentation (4.7 times higher) compared to cephalic vaginal delivery (Coutinho, Cecatti, Surita, Costa, & Morais, 2011) .

Low birth weight newborn have a greater risk of illness or death need especial care instrument trained health personal prolonged hospitalization increase bed occupancy after birth and (Organization & Unicef, 2004) is expose the family to high health care cost (Sicuri et al., 2011). Low birth weight is an indicator of the general health of newborns, and the main determinant of infant survival, health and development, low birth weight infants are at a greater risk of dying from start of the first day to month and year of life in developed country, half of babies born at 24 weeks may survive, but in low-income settings half of babies born at 32 weeks even die due to a lack of basic care (Blencowe et al., 2013) .

later in life develop non communicable disease like a type 2 diabetes and coronary heart disease (W. W. G. N. Targets, 2014). More than 80% of neonatal mortality occurs among low birth weighted newborns in southern Asia and Sub-Saharan Africa(He et al., 2018) Information on birth weight was obtained for only 14% of births thirteen percent of babies weighed less than 2.5 kg at birth , 29.1% of Ethiopian babies were reported "small" at birth (E. D. EDHS, 2016).In different parts of Ethiopia prevalence of low birth weight is -jimma (11.02%),(Gebremariam, 2005) , Laelay Maichew (6.6%) and Axum district (9.9%) (Teklehaimanot, Hailu, & Assefa, 2014).

The proportion of term low birth weight was 8.1% the study in wolaita sodo(Kastro, Demissie, & Yohannes, 2018) . In Amhara region prevalence of low birth weight is 22.2 % (E. EDHS, 2016b) in Gondar Referral Hospital the prevalence of LBW was 17.1% (Zeleke, Zelalem, &

Mohammed, 2012) and including the town health institution of Gondar 17.4% s(Zenebe, Awoke, & Birhan, 2014) .There is limited study in Tibebe Geon and felege hiwot specialized hospitals about current prevalence and associated factors of low birth weight so this study fill this gap and help programmers and concerned institutions to establish preventive and curative strategies of low birth weight.

1.3. Objective of the study

1.3.1. General objective of the study

To assess prevalence and associated factors of low birth weight of new born with mother in Tibebe Geon and Feleghiwot specialized hospitals, North West Ethiopia 2020.

1.3.2. Specific objective

- To assess the prevalence of low birth weight in Tibebe Geon and felege hiwot specialized hospitals Bahirdar.
- To identify factors associated with low birth weight in Tibebe Geon and Feleghiwot specialized hospitals.

1.4. Significance of the study

Low birth weight is public health problem for developing countries; remains constant and an increasing contribution of neonatal and child mortality. Low birth weight is an indicator of new born survival and also an indicator of mother's nutrition and health status. There is shortage of skilled health worker and intensive neonatal care unit. There is lack of information about the burden of low birth weight in the hospital and its prevention.

So there is limited study on the prevalence and associated factor of LBW inTibebe Geon and Felege Hiwot specialized hospitals .Therefore, the findings from this study will provide information for hospital managers to know the problem and take measures, regional health bureaus will take evidence based information to aware health institution and the community about the factors and there prevention NGOs work in maternal and child health observe the gaps to work on prevention and management of low birth weight, researchers, get information for future studies.

2. LITERATURE REVIEW

2.1. Prevalence of low birth weight

The prevalence of term-SGA babies ranged from 5·3% of live births in East Asia to 41·5% in south Asia, and the prevalence of preterm-SGA infants ranged from 1·2% in Southeast Asia. Of 18 million low-birth weight babies 59% were term-SGA and .41% were preterm (Lee et al., 2013). Pakistan had the highest prevalence of LBW(Low Birth Weight) (35.1%) followed by Nepal (29.7%) (Mahumud et al., 2017), in India prevalence of LBW was 17% (Kumar et al., 2017). In Africa 14 .3% were low birth weight in North Africa to 3·0% (Organization & Unicef, 2004). The prevalence of low birth weight in sub –Saharan African countries was estimated to be 13% to 15% (Lee et al., 2013).IN Ethiopia prevalence of low birth weight is 29.1% (T. Alemu & Umeta, 2016) , national prevalence of LBW (Low Birth Weight) in Ethiopia. Accordingly, the national pooled prevalence of LBW was 17.7% (14.1–20.4%). In different parts of Ethiopia-jimma (11.02%), (Gebremariam, 2005), Laelay Maichew (6.6%) and Axum district (9.9%) (Teklehaimanot et al., 2014), the proportion of term low birth weight was 8.1% the studying in wolaita sodo (Kastro et al., 2018) . in Gondar Referral Hospital the prevalence of LBW was 17.1% (Zeleke et al., 2012) and including the town health institution of Gondar 17.4% s(Zenebe et al., 2014).

2.2 Associated factor for low birth weight

2.2.1. Socio demographic factors

-**Age of the mother**- age of the mother<20 year give low birth weight (Rajashree, Prashanth, & Revathy, 2015),(Demelash, Motbainor, Nigatu, Gashaw, & Melese, 2015). More LBWs were observed among women whose ages were more than 40 (Assefa, Berhane, & Worku, 2012) , mothers with the age of 20-34 years old were 60% reduced the risk to deliver low birth weight when compared to those who have 35years old and above (Adane & Dachew, 2018) .

-Educational status--The LBW rate was particularly high for women who were illiterate (Tang et al., 2017). illiterate or primary educated mothers have high chance of low birth weight than mothers higher education/ employed mothers may be due to information difference and eat on time have normal weight study showed.

Residence-More LBWs were observed among women who were rural resident (Assefa et al., 2012). Low birth weight was associated with rural place of residence (Gebremedhin, Ambaw, Admassu, & Berhane, 2015).

-Income -monthly income <26 United States Dollar (USD)(Demelash et al., 2015). socio-economic status of family increased, the proportion of LBW decreased and only 11.9% babies were LBW who belonged to upper middle socioeconomic status (Sah, Gaurav, Baral, Jha, & Pokharel, 2014) . Joshi et al and Thomre et al reported the higher prevalence of LBW among lower class (62.71%) and upper class (67.86%) as compared to lower middle class (23.81%) and no LBW was reported from upper class. They also reported the higher prevalence (21.8%) of LBW among lower socioeconomic (Joshi, Kishor, Sochaliya, & Shrivastav, 2014; Thomre, Borle, Naik, & Rajderkar, 2012). Lowest Monthly income was significant associated to LBW study in (Adane & Dachew, 2018).

-Sex of new born - gender of the babies was associated with low birth weight (Kumar et al., 2017). There is a significantly higher proportion of LBW in female babies than male babies in Axum and Laelay-Maichew districts (Teklehaimanot et al., 2014).

-Maternal occupation- Hard physical work during pregnancy was found to be factor of LBW. The association between birth weight with occupation of mother was significant in (Kumar et al., 2017) House wife- most of the mothers leaving at home with different activities which is

not fed herself until her husband coming/fed family first if any shortage she miss her fed due to this reason the chance of normal birth weight are reduced or occurrence of preterm birth is high due to heavy work in(Bener, Salameh, Yousafzai, & Saleh, 2012)

2.2.2. Nutritional factor of the mother

-Hemoglobin level- mothers with hemoglobin level less than 11gm/d delivered low birth weight(Sharma et al., 2015) hemoglobin level of the mother at the time of delivery <11g/dl give low birth weight (Rajashree et al., 2015). Maternal anemia in the first trimester showed a significant relationship with birth weight, maternal anemia in the second and third trimester has no significant relationship with low birth weight in the study (Rahmati, Delpisheh, Parizad, & Sayehmiri, 2016). Mothers who had anemia during current pregnancy were 14 times more likely to deliver low birth weight neonate compared to mothers without anemia (Aboye, Berhe, Birhane, & Gerensea, 2018)

- Iron supplement - the prevalence of LBW was 21.8% among the mothers who had taken IFA tablets for less than 100 days while proportion of LBW was 9.9% in case of those mothers who had taken IFA for more than 100 days. The association between birth weight and IFA intake was highly statistically significant (Kumar et al., 2017). mothers not frequently consuming fruits during pregnancy had a higher risk of having term low birth weight newborns(Kastro et al., 2018).

- MUAC-Low middle-upper arm circumference increased the risk of low birth weight infants in rural, but not in urban women (Kaur et al., 2019)Women who had MUAC of less than 23 cm had more LBW babies than those who had MUAC of 23 cm and more (Assefa et al., 2012) Mothers with MUAC less than 23 cm were associated for low birth weight more than three times and have a chance of low birth weight than 25 cm (Adane & Dachew, 2018).

2.2.3. Maternal morbidity

Malaria- malaria is one of the risk factor for low birth weight in Africa the risk is higher in adolescent pregnancy than nullity (Walker, ter Kuile, Garske, Menendez, & Ghani, 2014). Malaria during pregnancy can result in low birth weight(Guyatt & Snow, 2004) infections, such as malaria is factors of low birth weight(Ramakrishnan, 2004) Low birth weight is associated with presence of any chronic medical illness(Gebremedhin et al., 2015).

Pregnancy induced hypertension /Preeclampsia: There were associations of both systolic blood pressure (SBP) and diastolic blood pressure (DBP) with risk of SGA in the third trimester and with PTB in both second and third trimesters(Bener et al., 2012; Fosu, Abdul-Rahaman, & Yekeen, 2013; Mills, Graubard, Harley, Rhoads, & Berendes, 1984) Pregnancy induced hypertension were 6 times associated with LBW than non PIH mothers study in (Adane & Dachew, 2018) .

-HIV- mothers who had a CD4 count level below 200 cells/mm3 had 4.2 times higher risk of having LBW as compared to those with CD4 level above 350 cells/ (Kebede, Andargie, & Gebeyehu, 2013). CD4 counts below 200 cells/mm3, and start of HAART the increasing Factors on that study.

2.2.4. Obstetric factors

Gestational age- Low birth weight in preterm is 19.6 times than terms study in Qatar and other literatures show gestational age < 37 weeks are risk for low birth weight studies in (Blencowe et al., 2013; Dandekar, Shafee, & Sinha, 2014; Sutan, Mohtar, Mahat, & Tamil, 2014). The chance of LBW delivery were 4.7 times higher for neonate with gestational age < 37 weeks in studies (Aboye et al., 2018; Endalamaw, Engeda, Ekubagewargies, Belay, & Tefera, 2018).

Birth interval – mothers with birth interval <2years delivered low birth weight neonates, <2 years the inter pregnancy interval between the birth of one child and conception of the next appears to be one of the factors associated with preterm birth ,low birth weight and growth restriction, inter-pregnancy interval <2 year is risk for low birth weight (Davoudi et al., 2012; Demelash et al., 2015; Rajashree et al., 2015)

Parity-The LBW rate was particularly high for women who had delivered three or more infants and who had multiple gestations. (Tang et al., 2017). Compared to parity of 1–4 ; primipara and parity of 7+ had more LBW babies (Assefa et al., 2012).

Number of ANC visit - The LBW rate was particularly high for women who had not received antenatal care (Tang et al., 2017) . Mother who had ANC follow up had 92.4% less chance to have low birth weight baby than those who didn't have.(Aboye et al., 2018). mothers Attend at list one antenatal care visit associated low birth weight(Tsegaye & Kassa, 2018).

Time of first ANC visit- No ANC registration/late ANC registration was risk factor for LBW the starting time for ANC should be at the first trimester if not she loss dietary counseling and iron supplement end up with micronutrient deficiency, study done in (Fosu et al., 2013) .

Bad obstetric history- like still birth, prenatal mortality(death of neonate on the first one week intrauterine fetal death has an association with low birth weight (Fosu et al., 2013). history of any pregnancy complication were predictors of low birth weight. (Hailu & Kebede, 2018).

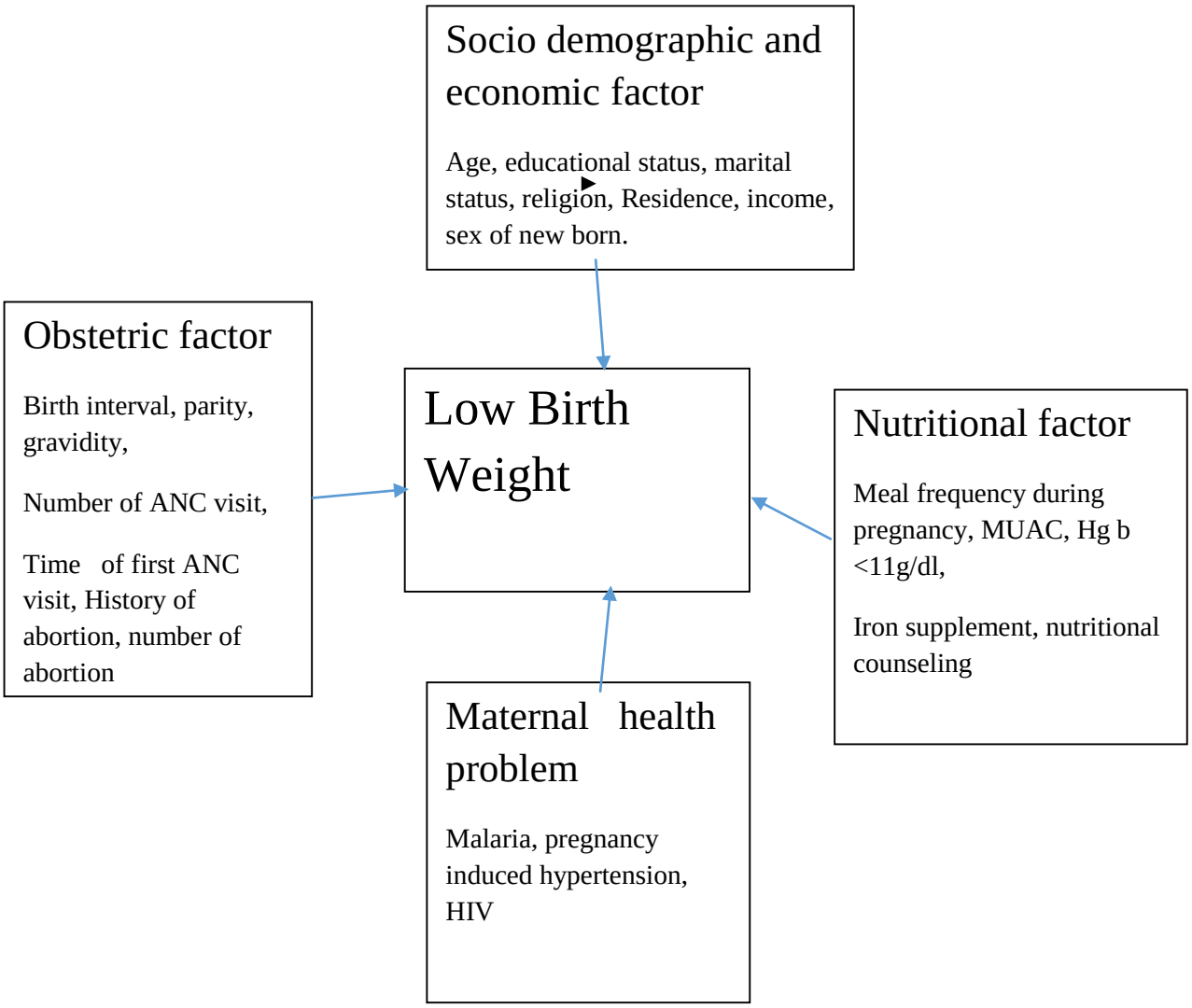

Figure 1. Conceptual frame work for associated factor of low birth weight among new born.

3. METHOD

3.1. Study setting

Bahir Dar city is 549 km away from Addis Ababa capital city of Ethiopia. Which is located in the North Western part of Ethiopia. The total population is 339683 of this 274459 people are urban dwellers while 65224 people are rural dwellers. Bahir Dar has two public specialized hospitals, one district hospital and 6 public health centers, 4 private general hospitals, .The study was conducted in two specialized public hospitals which is TibebeGeon and Felge- Hiwot specialized hospitals; monthly average deliveries in Tibebe Geon=250 and Feleghiwot=400/month ,total deliveries =650 deliveries/month.

3.2. Study Design and period

Institutional based cross-sectional study was conducted from January 1/2020. To February 31/2020.

3.3. Source population

All new born with mothers in Tibebe Geon and felege hiwot specialized hospitals during the study period

3.4. Study population

All sampled newborn with mother in Tibebe Geon and felege hiwot specialized hospitals during the study period

3.5. Inclusion and Exclusion criteria

3.5.1. Inclusion criteria:

During the study period all mothers who were given single birth in Tibebe Geon and felege hiwot specialized hospitals and mothers were given birth anywhere coming for health service within one hour or within 24 hours of birth, July 2020.

3.5.2. Exclusion criteria

- Immediate maternal death and fetal anomalies were not included in the study.

3.6. Sample size-

The sample size was determined using single proportion formula.

n = $(Z\,\alpha/_2)2 \quad P\left(\frac{1-P}{d^2}\right)$

n=total number of sample size

Prevalence or proportion(p) = 17% which has taken from study in Gondar Referral Hospital (Zeleke et al., 2012).

Z = standardized normal distribution value for the 95% Cl, which is 1.96

q=1-p and

d= margin of error=5%

The minimum sample size required was 216 plus non-response rate 10%=21, total sample size (n) was237 new born with mother.

3.7. Sampling procedure

Bahirdar city has two public specialized Hospitals, Tibebe Geon specialized hospital (TGSH) =N1and Felege hiwot specialized hospital (FHSH) =N2. Sampling procedure was depend on Tibebe Geon and felege Hiwot specialized hospitals, average monthly delivery report, registration and patient flow. Purposive sampling method was used to select these hospitals. Average monthly delivery report in Tibebe Geon hospital N1= 250 and in Felege hiwot hospital average monthly delivery wasN2= 400 births per month, the total average monthly delivery here are N1+N2= 250+400=650 deliveries (new born)/month so by proportional allocation in each hospital n1= n*N1/N= 237*250/650=91 new born, n2=n*N2/N=237*400/650=146. Total sample size=n1+n2= 237=91+146=237.Then k (interval) =N/n (1300deliveries in two months/237) =5 by lottery method choose 2 from 1-5. Participants were selected by systematic random sampling technique. Data was collected randomly every 5 deliveries starting from the 2nd participant for two months duration (January and February).

3.8. Study variables-

3.8.1. Dependent Variable-Low birth weight

3.8.2. Independent variables-

Socio demographic and economic factor: Are Residence, age of the mother, religion, Marital Status, Occupational of the mother, educational status, average monthly income, and sex of the neonate.

Nutritional status: Hgb level, iron supplement, MUAC, nutritional frequency

Maternal morbidity: pregnancy induced hypertension, HIV status.

Obstetric factor:

Numbers of ANC visit, ANC starting time, Parity, gravidity, order on child Gap between pregnancies (birth interval) and bad obstetric history(History of abortion, Number of abortion)..

3.9. Operational definition

Low Birth weight – Birth weight is the first weight of the new-born measured with in 1 hour after birth. Low birth weight were those newborns weighed less than 2500g while those newborns with birth weight of 2500g and above were considered as normal weight .

MUAC-maternal MUAC less than 23 cm termed as poor maternal nutrition and MUAC greater than and equal to23 cm termed as good maternal neutrino.

Meal frequency- the mother eat less than 3 times is not good but greater than and equal to 3 times is good meal frequency .

Birth interval- less than two years is not safe but greater than to two years is termed as safe risk birth interval.

3.10. Data collection and data collectors:

Data collectors were recruited, trained then Data were collected from mothers via face to face interview using quantitative structured questionnaire adapted from another study in Ethiopia

districts (Teklehaimanot et al., 2014). (Assefa et al., 2012) .(Adane & Dachew, 2018). (Aboye et al., 2018; Endalamaw et al., 2018) and modified by principal investigator depend on literature review initially adapted in English and translated into Amharic. The data quality was assured by pre-tested in 5% of sample size in Addisalems hospital. Data collecting tools or measurements calibrated every new born, the data was checked complexness ,data was collected by 2 BSC female trained nurses and supervisor 1 female BSC nurse who were familiar with the area and speak the local language and data checked for completeness by supervisor and investigator.

The data collectors were took new born weight within 1 hours of birth if not within 24 hours and 2 data collectors measure independently. After delivery MUAC was measured when she became comfortable. Medical cards used for investigations, gestational age, ANC visits, Hgb of the mother, for medical illness and new born weight if necessary. Maternal MUAC was measured by data collectors and interpret according to the WHO standard guideline.

Obstetric factor variables: gravidity, parity, history of abortion, number of abortion of mothers, current pregnancy interval, starting time of ANC visit, total ANC visited contained 8 questions

Structured quantitative questionnaires prepared. Quality and reliability of the questionnaire was checked by pretesting 19 questionnaires in Addisalems hospital and was modified according to the pretest result. Data collectors was recruited, trained then Data was collected from mothers via face to face interview using structured questionnaire adapted from another study and modified by me depend on literatures initially adapted in English and translated into Amharic. The instrument was pre-tested in 5% of sample size. The data was collected by 2 BSC female trained nurses and supervisor was 1 female BSC nurse who were familiar with the area and speak the local language. The questionnaires were found other studies done in prevalence and a

The data collectors were measured new born weight within 1 hours of birth if not within 24 hours and 2 data collectors measured independently maximum allowable difference (birth weight 5 gram WHO). After delivery MUAC was measured when she is comfortable. Medical cards were used for investigations, gestational age, ANC visits and for medical illness. MUAC was measured by data collectors, interpret according to the WHO standard guideline.

3.11. Quality control

The study unit was selected by using systematic random sampling the quality of data was maintained by pre-testing, a two day discussion and demonstration among data collectors on how to fill the format and MUAC measurements were standardized and check daily supervision performed by supervisor ensure the adherence throughout data collection process. The data was checked for completeness, accuracy, and consistency by the investigator before accepting from the data collectors .

3.12. Data processing, analysis, interpretation and presentation:

Data were collected, coded, entered by using the EPI-INFO version 7 software and analyzed using SPSS version 23. Descriptive statistics like percentages, proportions, mean and standard Deviation were presented. . Multivariable analysis was performed using Hosmer Lemeshow model to identify factors associated with LBW P- values less than 0.05 would be considered statistically significant. The result present by tables, graphs and text.

3.13. Plan for dissemination of the result:

The result of this study will disseminate to Bahir dar University , to Tibebe Geon and Felege hiwot specialized Hospitals, regional and zonal health office , to other governmental & non-governmental organizations who work on maternal and neonatal health service that may benefit from the study results.

3.14. Ethical consideration

The proposal was submitted to Bahirdar University, Department of applied human nutrition school of Food and chemical engineering and Ethical clearance was obtained.

Formal permission paper was given to Tibebe Geon and Felege Hiwot specialized Hospital. Informed consent also obtained from the study participants after explaining the purpose of study. Confidentiality of women and neonate ensured by appropriate data handling was maintained by omitting participant name on the questionnaire.

Participants was informed on their full right to skip any question or terminate their participation at any stage if she doesn't want. Participants were also assured that there was harm or benefit of being participating in the study.

4. RESULT

4.1 Descriptive statistics

4.1.1 Socio demographic factor:

A total of 237 low birth weight of new born children from Tibebe Geon and Feleghiwot specialized hospitals were included in the study with a response rate of 100 %. Most of their mothers' ages 190(80.2%) were between 20 and 34 years and almost two thirds of 175 (73.8%) their mother lives in rural residence.

About 95(40.1%) of mothers of new born were not read and write and mothers76 (32.1%) were housewife. Half of the mothers of new born 120 (50.6%) house hold income had 3000-6000 birr. Out of the total new born children reported more than half of 129 (54.4%) were females. The majority of mothers of new born children 217 (91.6%) religions were orthodox. All mothers of new born children 237 (100%) were married.

Table 1; Socio-demographic factors of low birth weight of new born children in Tibebe Geon and Feleghiwot specialized hospitals (n=237), Bahir dar, North West Ethiopia, 2020.

Variables		Frequency	Percent (%)
Age of mother	< 20 year	**23**	**9.7%**
	20-34 year	**190**	**80.2%**
	35-49 year	**24**	**10.1%**
Residence	Urban	**62**	**26.2%**
	Rural	**175**	**73.8%**
Religion	Orthodox	**217**	**91.6%**
	Muslim	**19**	**8%**
	Protestant	**1**	**0.4%**
Marital status	Married	**237**	**100%**

Educational status of mother	Secondary and above educated	**65**	**27.4%**
	Primary educated	**77**	**32.5%**
	Not able to read & write	**95**	**40.1%**
Occupational status of mother	Employed	**59**	**24.9%**
	Merchant	**41**	**17.3%**
	Housewife	**76**	**32.1%**
	Farmer	**61**	**25.7**
Household income of mother(Birr)/month	< 3000	**10**	**4.6%**
	3000-6000	**120**	**50.6%**
	>6000	**107**	**45.1%**
Sex of the new born	Female	**129**	**54.4%**
	Male	**108**	**45.6%**

4.1.2 Obstetric factors;

More than half 131 (55.3%) of new born mothers had II-III gravidity and136 (57.4%) of them had one parity. Most of 211 (89%) new born mothers had not history of abortion and the inter pregnancy interval of most mothers141 (87.6%) were greater than or equal to two years. More than half of143(60.4%) new born mothers were starting their ANC follow up on the first trimester .Gestational age of most mothers of new born children207(87.3%) were greater than or equal to37weeks.All mothers of new born children had antenatal follow up.

Table 2; Obstetric factors of low birth weight of new born children in Tibebe Geon and Feleghiwot specialized hospitals (n=237), North West Ethiopia 2020.

Variable		Frequency	Percent (%)
Gravidity of Mother	I	62	26.2%
	II-III	131	55.3%
	>III	44	18.6%
Number of Parity of mother	I	136	57.4
	II-III	79	33.3%
	>III	22	9.3%
History of abortion	Yes	26	11%
	No	211	89%
Number of abortion of mother(n=26)	Once	22	84.6%
	=>Twice	3	11.5%
	≥ three	1	3.9%
Recent inter pregnancy interval (year)n=161	<2	20	12.4%
	≥2	141	87.6%
Starting time for ANC	The first 3 months	143	60.3%
	3-6 months	79	33.3%
	6-9 months	15	6.4%
Gestational age (by week)	<37 weeks	30	12.7%
	≥ 37 weeks	207	87.3%
Total ANC follow up visited	Once	6	2.5%
	Twice	18	7.6%
	Three times	89	37.6%
	≥ four times	124	52.3%

4.1.3 Maternal morbidity factors;

Almost all 223 (94.1%) mothers of new born had not history of pregnancy induced hypertension and at the same time most of them232 (97.9 %) mothers were negative HIV status.

Table 3; maternal morbidity factors of low birth weight of new born children in Tibebe Geon and Feleghiwot specialized hospitals, North West Ethiopia 2020

Variable		Frequency	Percentage (%)
Pregnancy induced HTN	Yes	14	5.9%
	No	223	94.1%
HIV status of mother	Positive	5	2.1%
	Negative	232	97.9%

4.1.4 Nutritional factors of mothers.

Most of mothers of new born children 115(48.5%) mothers had MUAC <23cm. 232(97.9%) of mothers had greater or equal to 11gm/dl hemoglobin level. 209 (88.2%) of mothers get Fe supplementation in index pregnancy. Most of mothers183 (87.1%) had supplemented for greater or equal to 3monhs.232 (97.9%) of mothers of new born children had no anemia during pregnancy. 215(90.7%) mothers had nutritional counseling Most of mothers109 (46.0%) had 3times meal frequency per day.

Table 4; Nutritional factors of mother on low birth weight of new born children in Tibebe Geon and Feleghiwot specialized hospitals, North West Ethiopia, 2020

Variable		Frequency	Percepts (%)
Mid upper arm circumference of mother	<23	29	12.3%
	23-25	93	39.2%
	>25	115	48.5%
Hemoglobin level of mother(g/dl)	< 11g/dl	5	2.1%
	≥ 11g/dl	232	97.9%
Fe supplementation in index pregnancy	Yes	209	88.2%
	No	28	11.8%
Months of Fe supplementation(n=210)	<3 months	27	12.9%
	≥3 months	183	87.1%
Anemia during pregnancy	Yes	5	2.1%
	No	232	97.9%
Nutritional counseling of mother	Yes	215	90.7%
	No	22	9.3%
Meal frequency per day during pregnancy	Twice	21	8.9%
	Three times	109	46.0%
	≥Four times	107	45.1%

4.1.5. Prevalence of low birth weight of new born neonates;

The prevalence of low birth weight new born was 12.7% in Tibebe Geon and Feleghiwot specialized hospitals. From this 129 (54 .4 %) were females. The mean weight of new born was 3001.69g, (±SD 571.273) and Range was 3300gm.

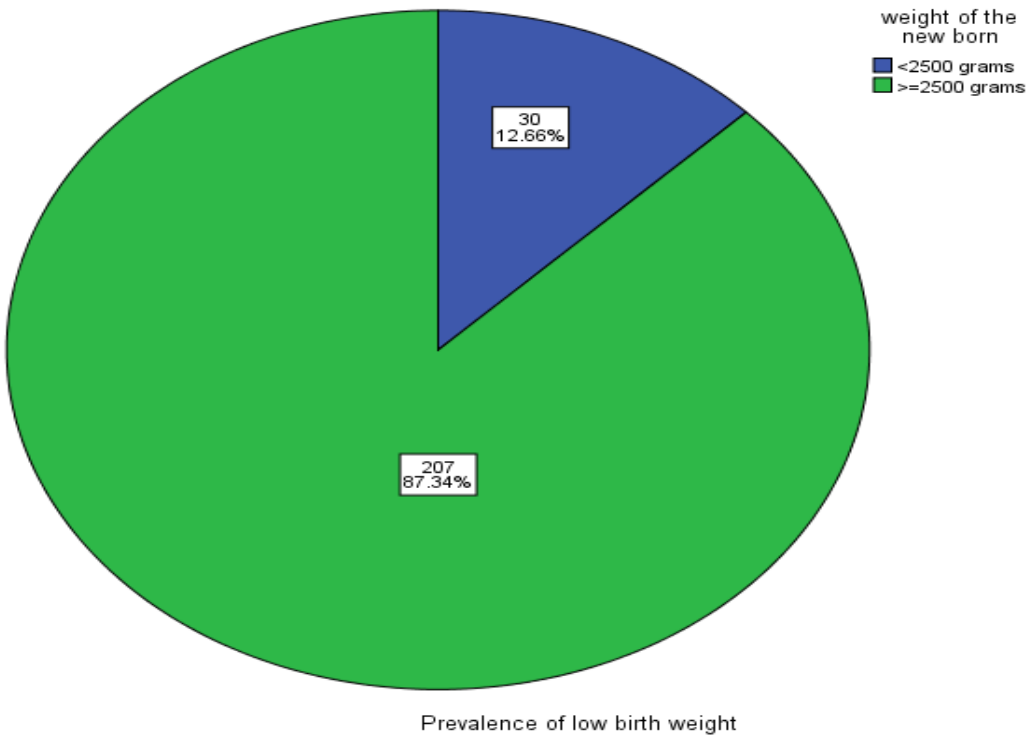

Figure 2; Prevalence of low birth weight of new born in Tibebe Geon and Feleghiwot specialized hospitals, North West Ethiopia 2020.

5. Simple and Multiple Binary Logistic Regression Analysis

To identify factors associated with low birth weight of new born, each variable were assessed independently weather they were predictor of low birth weight or not. So each independent variable was tested first by using simple binary logistic regression. The independent variables in the analysis ($p<0.25$) were; residence of mothers, educational status of mother, occupational status of mother and sex of new born.

Independent variables that had association in the simple binary logistic regression were fed to the multiple binary logistic regressions to see their final significance association with low birth weight of new born. After adjusted the potential confounders in multiple binary logistic regression; residence of mother , educational status of mother and sex of new born remained significance with low birth weight of new born in the model ($p<0.05$)while occupational status of mother associated in simple binary logistic regression was out in multiple binary logistic regression.

Residence of mother-rural (AOR= 3.2;95% CI(1.3-9.7) 3 times more likely to deliver LBW baby than those urban residence mothers, educational status of mothers primary educated mothers 3times AOR3.3 (95% CI: 1.2-9.3) and unable to read and write AOR 8.9(95% CI: 1.7-48.0) 8times risk to deliver LBW than those mothers educated secondary and above .

Table 5; Simple and multiple binary logistic regression analysis showing the association between low birth weight of new born and selected significant independent variables in Tibebe Geon and Feleghiwot specialized hospitals, North West Ethiopia 2020.

Variable	Low birth weight		COR (95%CI)	AOR (95%CI)	P-value
	<2500 gm. (N, %)	≥2500gm (N, %)			
Residence					
Urban	21(33.9)	41(66.1)	1.0	1.0	
Rural	9 (5.1)	166(94.9)	9.4(4.0-22.1)	3.2(1.3-9.7)	**0.014***
Mother education status					**0.012***
Secondary& above educated	21(70.0)	44(21.3)	1.0	1.0	
Primary educated	7(23.3	70(33.8)	4.8(1.9-12.2)	3.3(1.2-9.3)	0.024*
unable to read & write	2(6.7)	93(44.9)	22.1(5.0-98.8)	8.9(1.7-48.0)	0.011*
Mother occupation					
Employed	2(3.4)	57(96.6)	1.0		
Merchant	1(2.4)	40(97.6)	1.4(0.12-16)		
Housewife	6(7.9)	70(92.1)	0.4(0.1-2.1)		
Farmer	21(34.4)	40(65.6)	0.07(0.02-0.3)		
Sex of new born					
Female	10(33.3)	119(57.5)	1.0	1.0	
Male	20(66.7)	88(42.5)	2.7(1.2-6.0)	2.7(1.1-6.5)	**0.033***

6. DISCUSSION

The aim of this cross-sectional institution based study was to assess prevalence and associated factor of low birth weight of new born in Tibebe Geon and Felege hiwot specialized hospitals .The prevalence of low birth weight of in these hospitals was 12.7% ,this finding was in line with the study conducted in Deber Tabor Hospital 12.0% (Mekie & Taklual, 2019), The finding is consistent with a study conducted **i**n Dangla primary hospital, Amhara Region, Ethiopia 10.3%(Mahumud et al., 2017). Maternal residence, mothers educational status and, sex of new born were significantly associated with low birth weight. Low birth weight newborn have a greater risk of illness or death need especial care instrument trained health personal prolonged hospitalization increase bed occupancy after birth (Organization & Unicef, 2004) . This cross-sectional institution based study presents the report of 237 new born with mothers in Tibebe Geon and Felege hiwot specialized hospitals. The finding of this study was supported with the finding of the EDHS 2016 which is found In Amhara region was 22.2 % of the births to be LBW (E. EDHS, 2016a). The variation might be related to difference in the study setting, 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 Sample size difference. The finding of this study also supported with LBW prevalence in Pakistan (35.1%) followed by Nepal (29.7%) (Mahumud et al., 2017), in India was 17% (Kumar et al., 2017) , in Gondar Referral Hospital was 17.1% (Zeleke et al., 2012),. -jimma hospital (11.02%),(Gebremariam, 2005) , Laelay Maichew (6.6%) and Axum district (9.9%) (Teklehaimanot et al., 2014), the study result in wolaita sodo 8.1% (Kastro et al., 2018),the difference might be due to study design seasonal variation and /or sample size variation. Residence of mothers was significantly associated. Rural residence mothers had 3times more likely to be of LBW than those urban residence mothers (AOR= 3.2; 95% CI (1.3-9.7). This might be related to difference in geography, awareness about nutrition and health, in which urban women found better information related to nutrition and health than rural mothers , due to heavy work load, rural mothers also prone to religious and cultural reasons (Mahumud et al., 2017) this is because the residence might directly and indirectly affect mother health by hindering not to have health care service during pregnancy and may end up adverse birth outcome (LBW) . This result was supported with the study in kersa Ethiopia (Assefa et al., 2012),Tigray (Gebremedhin et al., 2015). Educational level of mothers was significantly associated. Their education level was primary and unable to read and write was 3 times and 8times more likely to be LBW than mothers educated

secondary and above AOR3.3 (95% CI: 1.2-9.3) and AOR 8.9(95% CI: 1.7-48.0) respectively, this result was supported by study done in china (Tang et al., 2017) sex of new born was significantly associated with LBW, male new born were 2 times more likely to have LBW than female new borns. This result was supported with studies conducted in northern Indian (Kumar et al., 2017), Axum and Laelay Maichew (Teklehaimanot et al., 2014) The possible reason might be due to heavy work load, poor maternal nutrition and/or geographical variation.

This study has some limitations first not include public health centers and private health institutions. In addition the cross –sectional nature of the study does not confirm definitive cause and effect relationship and we did not have data on other factors possibly associated with low birth weight such as unwanted pregnancy, family size and seasonal variation.

7. Conclusion

In this study ,there is high prevalence of LBW compared to similar institution based studies in Ethiopia .Low birth weight was significantly associated with maternal residence, Educational level and sex of the new born (gender).

8. Recommendation

For Amhara regional health bureau and zonal health bureau- focused on intensive community awareness about effect of maternal education level on low birth weight and work on rural mothers to improve their living style and to know the effect of low birth weight maternal factors and the prevention method of low birth weight.

For researchers*- recommend further studies in seasonal variation family size, unwanted pregnancy and other factors not included in this study*

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Annexes

9. Questionnaires

9.1. Questionnaires English

Informed consent:

Good morning/good afternoon. My name is_____ I came from Bahirdar university institute of technology, school of chemical and food engineering ,applied human nutrition department .We are here to gather information on nutritional status of new born and mother So I want to ask you some questions. There is no right or wrong answer to each question. However the Information you provide based on your experience as a postnatal mother will help to improve the newborn and maternal service for all newborn and women. Your name will not include in the information, whatever information you provide, it will keep strictly confidential participation in the survey is voluntary &you can choose not to answer any question or all of the questions. The interview will take about 10 to 15 minutes .though it seems long time I kindly request you to participate in genuinely answering the interview. Do you have any questions? May I begin the interview now? (Circle)

1 . Yes - continue the interview

2...No – go to the next one Date_____

MRN:_____

Health institution_____ interviewer_____ Responses code_____

A , Social - Demographic data:

1	Age	---------- years	Skip
2	Residence	1) urban 2) rural	
3	Religion	1 Orthodox 2 Muslim 3 protestant	
4	Marital status	1 .married 2. divorced 3.Widowed	
5	Educational level	1 not able to read &write 2. primary (1-8) 34 secondary (9-12) and certificate 5. Diploma and above	
6	Occupation of the mother	1. employed 2. Merchant 3. house wife 4.farmer	
7	Household income per month	----------ETB ---------- _____Quintal/year for rural mother	
8	Sex of the new born	1. Male 2. Female	

B. Obstetric factor			
9	Gravidity	---------- If she is gravid 1 →	Skip to10
10	Number of parity	----------	
11	Abortion History	1) Yes 2) No	
12	If yes, how many times?	1) once 2) Twice 3) 3 times 4) four and above	
13	Inter-pregnancy interval (recent)	----------	
14	Starting time for ANC	1. First trimester 2. Second trimester 3 third trimester	
15	Gestational age by weeks:	1) <37 wks. 2) >37 wks.	
16	Total ANC follow up visited:	1) Once 2) Twice 3) Three times 4) Four & above times	

C Maternal morbidity

17	Raised BP on follow up/PIH?	1) Yes 2) No.	
18	HIV status:	1. Positive 2. Negative	Skip to20

D NUTRITIONAL FACTOR

19	MUAC for all postnatal mother	----------cm	
20	Hemoglobin or Hematocrit level:	---------- mg/dl, or ----------%	
21	Iron supplementation in the index pregnancy:	1. YES 2 NO	
22	If yes, for how long:	----------months	
23	. Anemia on follow up	1) Yes 2) No	
24	Do you have nutritional counseling	1) Yes 2) No	
25	Meal frequency per day	1) 2 times 2)3 times 3) 4 times and above	
26	weight of the neonate	----------gm.	

9.2. አማረኛ መጠይቅ

የጥናቱ መረጃና የፈቃደኝነት ማረጋገጫ

እንደምን አደሩ / እንደምን ዋሉ፣እኔ ስሜ---------- አባላለሁ፡፡ የመጣሁት ከባህርዳር ዩኒቨርስቲ ኬሚካልና ምግብ ምህንድስና ትምህርት ክፍል ነው፡፡ ከወሊድ በፊት የሚደረግ የእናትና ፅንስ የምግብ ሁኔታ ክትትልን በሚመለከት መረጃ እየሰበሰብኩ በመሆኑ አንዳንድ ጥያቄዎችን ላቀርብልዎ እፈልጋለሁ፡፡እያንዳንዱ ጥያቄ ትክክል የሆነ እና ትክክል ያልሆነ መልስ የለውም፡፡ነገር ግን እርስዎ ካለዎት ልምድ አኳያ የሚስጡት መረጃ ለሁሉም ነፍሰጡር እናቶችና ለጽንሱ እንክብካቤ እድገት አስፈላጊ ነው፡፡ስምዎት ከመረጃውጋር አይካተትም፤ የሰጡኝን መረጃ ሁሉ በሚስጥር እንደምጠብቅልዎ ቃል እገባለሁ፡፡ ተሳትፍዎ በእርስዎ ፍቃደኝነት ላይ ብቻ የተመሰረተ ሲሆን መመለስ የማይፈልጉትን ጥያቄ በከፊልም ሆነ በሙሉ አለመመለስ መብትዎ የተጠበቀ ነው፡፡ ይህንንም ለማድረግ ከእኔ ጋር 15-20 ደቂቃ እንቆያለን፡፡ ይህ ጊዜዎትንየሚይዝ ቢሆንም መላውን ነፍሰጡር እናቶችንና ጽንሱን ሊጠቅም የሚችል የአገልግሎት ጥራት ማሻሻያ ለማድረግየሚያግዝ በመሆኑ እንዲተባበሩኝ እጠይቅዎታለሁ፡፡ የተወሰኑ ደቂቃዎች ባነጋግርዎ ፈቃደኛ ነዎት?

1.ፈቃደኛ ነኝ ⇨ መጠይቁን ይጀምሩ

2.ፈቃደኛ አይደለሁም⇨ ወደሚቀጥለዉ ይለፉ

ቀን----------የሕክምና ከርድ ቁጥር----------

የጤና ድርጅቱ ስም---------- የጠያቂው ስም ----------የመጠይቅ ኮድ---

ሀ .አጠቃላይ መረጃ			
1	እድሜ	---------ዓመት	
2	የመጡበት ቦታ	1.ከተማ 2.ገጠር	
3	ሐይማኖት	1.አርቶዶክስ 2.ሙስሊም 3.ፕሮቴስታንት	
4	የጋብቻ ሁኔታ	1.ያገባ 2.የፈታ 3.በሞት የተለየ	
5	የትምህርት ደረጃ	1.ማንበብና መፃፍ የማይችል 2.አንደኛ ደረጃ [1-8 ክፍል] 3.ሁለተኛ ደረጃና እና ሰርተፍኬት 4.ዲፕሎማ እና ከዚያ በላይ	
6	ሥራወት	1.መንግስት ሰራተኛ 2.ንግድ 3.የቤት እመቤት 4.ገበሬ	
7	የቤትዎየወር ገቢ በገንዘብ ሲተመን ምን ያክል ነው?	_____ ብር ___ ኩንታል /በአመት/ ለገጠር እናቶች	
ለ .አጠቃላይ የወሊድ መረጃ			
8	ስንት ጊዜ አርግዘዋል? [የአሁኑን ጨምሮ]	_የመጀመሪያዋ ከሆነ	ወደ10ይለ ፉ
9	ስንት ጊዜ ወልደዋል ?	_____	
10	አስወርዶወት ያውቃል	1.አዎ 2.የለኝም	

11	አዎ ከሆነ ስንት ጊዜ	1.አንዴ 2.ሁለቴ 3.ሶስቴ 4.አራትናበለየ	
12	በርግዝና መካከል ያለው ርቀት ስንት ነው	----------	
13	ነፍሰ ጡር ምርመራ የጀመሩበት ጊዜ	1.የመጀመሪየ 3 ወር 2 .ከ3 እስከ 6 ወር 3 .ከ6 እስከ 9 ወር	
14	የርግዝናው ጊዜ ምን ያህል ሳምንት ነበር	1< 37 ሳምንት 2 >=37 ሳምንት	
15	ጠቅላላ የነፍሰጡር ክትትል ብዛት ስንትነው	1.አንድ 2 ሁለት3. ሶስት 4 .አራት እና በላይ	
ሐ. የእናትየዋ የበሽታ ሁኔታ			
16	በክትትል ወቅት የጨመረ የደም ግፊት ልኬት ከካርዱ ላይ ነበራቸው	1.አዎ 2.የለም	
17	የኤች.አይ.ቪ ሁኔታ	1.አልተመረመሩም 2.ከቫይረሱ ጋር ይኖራሉ 3. ነፃናቸው	ወደ29 ይለፉ
መ. የስራተ ምግብ ሁኔታ			
18	የላይኛው መሀል ክንድ ልኬት	----------ሴንቲሜትር	
19	የሆሞግሎቢን ልኬት	------- ሚሊሊትር/ዴሲሊትር	
20	በዚህ እርግዝና የድም ማነስ መከላከያ እንክብል ወስደዋል	1. አዎ 2.. የለም	
21	አዎ ከሆነ ለምን ያህል ጊዜ	----------ወር	

22	በክትትላቸው ደም ማነስ ነበራቸው	1. አዎ 2. የለም	
23	የምግብ ምክር አገልግሎት አገኝተው ያውቃሉ	1. አዎ 2. የለም	
24	በቀን ስንት ጊዜ ነው የሚመገቡት	1 ሁለትጊዜ 2.ሶስት ጊዜ 3.አራትጊዜ 4.አምስት ጊዜ	
25	የሕፃኑ ፆታ	1 ወንድ 2.ሴት	
26	የሕፃኑ ክብደት/ልኬት	----------ግራም	

ጊዜዎን ሰውተው ይህንን ጠቃሚ መረጃ ስለሰጡኝ በጣም አመሰግናለሁ ፡ሌላ አስተያየት ካለዎት ሊነ ግሩኝ ይችላሉ፡፡

Biography

I was born in September 27 1965 E.C in fenotselam town west Go jam Zone, Amhara Regional state. I attended my elementary school in Lejomi primary school and high school education in Damot secondary school I have graduated as health assistant in Bahirdar school of health assistance and I have served as a Health assistance in Motta Hospital , then I Joined Deber tabor school of nursing in 1995 E.C completed nursing Diploma and served in Deber markose Hospital and Feleghiwot referral hospital . Then I Joined Gondar University Health Science College, and completed my BSc in Nursing in 2005 E.C. Then worked in Feleghiwot referral Hospital as a clinical BSC Nurse then change my work setting in Bahirdar University since February 2007 E.C. Finally I join Bahirdar University applied human nutrition department to attend my post graduate study in 2009 E.C. Currently I'm a graduating class student for master's degree in Applied human nutrition.

INFORMATION SHEET

Full title of the research: Prevalence and associated factor of Low Birth Weight among new born with mother inTibebe Geon and felege Hiwot specialized hospitals, North West Ethiopia November 2019.

Name of the organization: Bahir dar university institution of technology faculty of chemical and food engineering applied human nutrition department

Name of principal investigator-Misrak Leykun

Phone .No-0910491666 Email: misrak12345@gmail.com

Name of the advisors: Dr .Netsanet Fentahun (MPH, double PHD, Associate Professor)

Phone. No. 0913516677

E mail: netsanetfentahun01@gmail.com

Duration of the study: This study was conducted from November 2019 to July 2020. Facility based, in health institution, Study area: Tibebe Geon and Felege Hiwot specialized hospitals. Total cost of the study 26,717.90 ETB.

Name of the sponsor – Bahir Dar University

Purpose of the research project; to assess the Prevalence and associated factor of Low Birth Weight among new borns with mother in Tibebe Geon and felege Hiwot specialized hospitals, North West Ethiopia July 2020 , to provide information to hospital managers to know the problem and take measures, regional health bureaus will take evidence based information to aware health institution and the community about the factors and there prevention, NGOs work in maternal and child health observe the gaps to work on prevention and management of low birth weight, researchers, get information for future studies.