

# Prevalence of Low Birth Weight and Associated Factors Among Women Delivered in Debre Markos Referral Hospital, East Gojam, Ethiopia, 2017

Habtamu Chanie(BSc, MSc)<sup>1\*</sup> Abebe Dilie ( BSc, MSc)<sup>2</sup>

1. Department of Midwifery, College of Medicine and Health Sciences, Debre Markos University, Ethiopia

2. Department of Nursing, College of Medicine and Health Sciences, Debre Markos University, Ethiopia

## Abstract

**Introduction:** low birth weight is defined as birth weight less than 2,500gram irrespective of gestational age. More than 20 million infant are born each year weighing less than 2,500gram, accounting 17% of all birth in developing world. Similarly, according to Ethiopia demographic and health survey (EDHS, 2011), 11% weighed less than 2,500gm. Birth weight is an important role in infant mortality and morbidity, development and future health of the child. **Objective:** The main objective of the study was to assess the prevalence of low birth weight and factor among women delivered in Debre Markos Referral Hospital, East Gojam, Ethiopia, 2017. **Methodology:** The study was institutional based cross sectional study design conducting by reviewing cards of mother who delivered in Debre Markos Referral Hospital from June 1, 2017 to August 5, 2017. Simple random sampling technique was used. Our sample size was 243 and the data were collected by using structured questionnaire. The data was entered by SPSS software version 20.0. **Result and discussion:** In this study 243 mother cards were included yielding 100% response rate. Out of 243 mothers, 36.3% participant was between age group 25-29 years. The prevalence of low birth weight in this study was 26.3%. ANC visit were significant associated with low birth weight (AOR, 0.285, 95% CI=0.111, 0.728, P-value=0.009). The sex of neonate was significantly associated with LBW (AOR=0.548, 95% CI= 0.303, 0.994, p-value =0.048. Additionally, and anemia [hemoglobin level] was significant associated with neonatal birth weight (AOR=0.129[87.1%], 95% CI=0.016, 1.011, p-value =0.054. **Conclusion and Recommendation:** The finding of this study concludes that the prevalence of low birth weight was 26.3%. The determinant factor for LBW were ANC visit, sex of neonate and anemia during pregnancy.

**Keywords:** low birth weight, magnitude, associated factors

## 1. INTRODUCTION

### 1.1. Background Information

Low birth weight has been defined by the World Health Organization (WHO) as weight at birth of less than 2500 grams up to and including 2,499 gram irrespective of gestational age of the infant. Globally, more than 20 million infant are born with low birth weight and larger proportion of these concentrating in Asia and Africa (1). This is based on epidemiological observation that infant weighting less than 2500 gram were approximately 20 times more likely to die than heavier babies. It is more commonly, in developing than developed countries. Factor associated with out come i.e. educational status, poverty, residence area, marital status and occupation developing countries less than developed countries. (2).

Low birth weight, defined as heterogeneous group of infant, some are born early, some are born growth restricted, and other are born both early and growth restricted (1). Birth weight is affected to a great extent by the mother's own fetal growth and her diet from birth to pregnancy and thus, her body composition at conception (3)). Weight at birth is a good indicator of the new born chances for survival, growth, long term health and psychosocial development. Low birth weight babies are significantly at risk of death, contributing to the high prenatal morbidity and mortality in developing country (4). Moreover, the morbidity continues throughout his or her life in addition to cognitive and growth impairment.

The classification of birth weight according to WHO are : low birth weight that is birth weight less than 2500gram, very low birth weight; birth weight less than 1500gram, very extremely low birth weight; birth weight less than 1000gram, normal birth weight greater or equal to 2500gram up to 4000gram but above 4000gram is known as overweight (5).

At regional level, for East Africa, the prevalence of low birth weight estimate that 13% (6). According to UNICEF statistics, the global rate of low birth weight is 17%, out of which 6% is observed in industrialized countries and 21% in developing countries (7).

WHO show that factor contributing to LBW in developing countries include, in adequate weight gain during pregnancy and low pre pregnancy weight, short stature, malaria and female sex of the fetus (7).

### 1.2. Statement of the Problem

The United Nation Children Fund (UNICEF) reported that, the global LBW rate was 15.5% and more than 95%

of these LBW infant lived in developing countries (3). More than 20 million infants are born each year weighing less than 2500gram accounting for 17% of allbirth in the developing world. Central and south America have, on average, much lower rate (10%) while in the Caribbean, the level (14%) is almost as high as in sub Saharan Africa, about 10% of birth in Oceania are low birth weight (3). While, Half of low birth babies are born in south central Asia, where more than quarter (27%) of all infant weight less than 2500 gram at birth. A low birth weight level in sub Saharan Africa is around 15% (8).

The prevalence of low birth weight published in 2006 by UNICEF indicated that, it was 15% of all live births in middle East/North Africa (9). According to the Uganda demographic Health survey 2011, 13.5% of 452 recorded birth weight were low weight among mother less than 20 years of age, 9.7% of 1,414 among mother ranging from 20-34 and 7.9% 203 among these ranging from 35-49 age (4).

The WHO country strategy 2008-2011 showed that the prevalence of low birth weight in Ethiopia estimated that 14%, it is one of the highest in the world (10). According to the 2005/06 annual activity report of Addis Ababa city Administration Heath bureau, the rate of LBW among all deliveries attended from health institution reporting to the city health bureau is 11% (8).The prevalence of low birth weight in Gonder and jimma town in 2015 was 17.4% and 11.8% respectively (7).

Low birth weight due to restricted fetal growth affect the person throughout life and is associated with poor growth in child hood and a higher incidence such as Type2 diabetes mellitus, hypertension, cardiovascular diseases, cerebral palsy, infection(sepsis), stature, ischemic heart diseases, metabolic syndrome, decreased lung capacity and chronic lung cancer (11).

Deliveries in low and middle income countries are often complicated by adverse birth outcome such as still birth, early neonatal mortality and morbidity. Low birth weight (LBW) remains to be a leading cause of neonatal death and is a major contributor to infant and under-five mortality (12). From those of the above cause preterm and small for gestational age are major one for death and morbidity (9).

Ethiopia being one of the second largest populous and developing country in Africa????, significantly reduced child mortality rate achieving the millennium development goal (MDGS) three year ahead of timeline 2015 (13) .It was September 13, 2013 the federal ministry of health (FMOH) of Ethiopia and UNICAIEF announced that Ethiopia has achieved MDG (14). However, the report and evidences elsewhere clearly showed that the contribution of neonatal mortality to infant mortality, in the nation has increased overtime and the country is still far behind in reducing neonatal mortality rate. More over approximately 42% of under-five mortality in Ethiopia is attributable to neonatal death and well established fact that over 80% of neonatal death is attributable to low birth weight babies (13). LBW a dangerous public health challenges for the 21<sup>th</sup> century and more research is needed to eliminate factors adffecting low birth weight. Mortality of LBW babies 40 times more likely to die in the first year of life than are an infant of normal birth weight (15) . Therefore, this study will be important to know the prevalence and its associated factor among women in Debre Markos, East Gojjam and also no study has yet been done to identify associated factor in this area. Since, the knowledge gained from this study can be applied to other part of country and beyond with similar country.

### **1.3 Justifications of the Study**

Our practical observation during our internship attachment period the occurrence of child who delivered in Debre Markos referral hospital below normal weight was high .Even if different research were conducted there is inconsistency in magnitude of the problem and factors associated with it. As per our knowledge there is no published research done in our study area regarding the problem. Therefore, this study was mainly intended to fill the information gap on low birth weight and factors associated with it.

### **1.4. Significance of the study**

The result of this study will be a baseline for other studies as well as for planning health intervention to improve the well-being of children and women in East Gojjam, in Debre Markos referral hospital Due to the absence of previous studies on this issue the finding of this study will be important to identify factors contributing to LBW in debar marks referral hospital This study will provide valuable information to policy makers to plan an intervention, and to researchers to conduct further research. The result of this research will be critical to develop intervention aimed at modifying factors associated with low birth weight.

## **3. Objective**

### **3.1 General objective**

-To assess the prevalence and factors associated with LBW among women Delivered in Debre Markos referral Hospital in Ethiopia, 2017.

### **3.2 specific objectives**

-To assess the magnitude of low birth weight

-To identify factor associated with low birth weight.

#### 4. Method

##### 4.1. Study area

Debre Markos, the capital of East Gojjam Administrative Zone is located in the north west of the capital city of Ethiopia, Addis Ababa at a distance of 300 kilometers and 265 kilometers to the capital of Amhara Nation Regional State, Bahir Dar. Specifically it is located in the Amhara regional state, East Gojjam zone. Until 1995, Debre Markos was the town of the province of Gojjam. The town is located at 10020'N latitude and 37043'E longitude and it has an average elevation of 2461meters above sea level. The area of Debre Markos Town is 6,160 ha and its Average Annual temperature is 18.5°C; Mean Annual Rainfall is 1,380 mm and the existing wind direction is from north to south. According to the federal democratic republic of Ethiopia statistical report of the 2007 population and housing census the total population was 92,470 and average annual growth rate of 4.5%. The hospital provide healthy service more than 3.5 million population. Currently about 100 health center and two district hospitals are available in the catchment area of the Referral hospital .there are 109 nurse, 3health officer, 16 general practitioner and 1emergency surgeon and 5 specialists Gynecologic and obstetrics ward has 19 midwife, 1Gynecologist and 1emergency surgeon. About 8136 patients are admitted /year, 34%of them obstetric ward.

##### 4.2. Study design and period

Institutional based cross sectional study design was used from June -1- August 25, in 2017.

##### 4.3 Population and sampling

###### 4.3.1 Source of population

All mothers who delivered in Debre Markos referral Hospital were the source of population.

###### 4.3.2. Study population

All mothers who delivered in Debre Markos referral Hospital from June 1, to August 25, 2017.

##### 4.4 Eligibility criteria

###### 4.4.1 Inclusion criteria

All mothers who delivered in Debre Markos referral Hospital from June 1, to August 25, 2017 were included.

##### 4.5. Sample size and sampling technique

###### 4.5.1 Sample size calculation

The requiring sample size was determined by using single population proportion formula with the following assumption; 17.4% of prevalence of LBW from previous studies conducted in Gonder (21), 95% confidence interval, 5% marginal error, 10% for non-response rate due to this the sample size was calculated by the formula,

$$n = \frac{(Z \alpha/2)^2 P (1-p)}{w^2}$$

Where n = number of sample size.

Z  $\alpha/2$  = the value of under standard normal table for the given value of confidence

Level = 1.96.

a=level of significance

P =prevalence of low birth weight

W = margin of error.

$$\text{Therefore, } n = \frac{(z \alpha/2)^2 p (1-p)}{W^2} = \frac{(1.96)^2 \cdot 0.174 (1-0.174)}{(0.05)^2} \\ = \frac{3.8416 \cdot 0.174 \cdot 0.826}{0.0025} = 221$$

By adding non – response rate, 10% our total sample size is 243.

###### 4. 5.2 Sampling techniques and procedure

Simple random sampling technique was used to select study unit during data collection time. This is due to by considering the cards of mother that registered in the study period and pick randomly the cards until reach the needed sample size.

###### 4 .5.3 Sampling procedure

The total numbers of live birth within three month were 1232.using simple random sampling by picking randomly.

##### 4.6 Variable of the study

###### 4.6.1. Dependent variable

-Neonatal Birth weight

#### 4.6.2. Independent variable

- Socio demographic characteristics such as maternal age, maternal occupation, religion, ethnicity, marital status and residence.
- Maternal behavior (chewing, drinking alcohol, cigarette smoking)
- Neonatal factor such as new born sex.
- Maternal and obstetrics characteristics such as PIH, maternal weight, gravidity, parity, birth interval, history of abortion, hemoglobin level, GA at birth, number of ANC follow up.

#### 4.7. Operational definition

- Birth weight – is the first weight of the fetus or new born, measured with before discharge
- Low birth weight – birth weight less than 2500 gram with irrespective of gestational age before discharge
- Small for gestational age – is defined as an infant being below the 10% percentile of the recommended gender specific birth weight for gestational age reference curve.

#### 4.8 .Data collection technique and procedure

##### 4.8.2. Data collection tool

Questioner paper, and card of mother were used. Structured questioner taken from previous literature ( ). The questioner was prepared by English language and it consists of 5-parts. Those are new born characteristics, maternal characteristics, history of current pregnancy, personal habit during pregnancy and socio demographic characteristics.

##### 4.8.3. Data collection procedure

The data was collected through the data abstract sheet. Training was given for both data collectors and supervisor. Three 4<sup>th</sup> year Nursing student was assign data collector and two students nursing was assign to supervise the data quality. Since, every morning the data collector were going to medical record unit of the hospital and examine the record of all birth cards that had been recorded completely. The mother who gave birth to LBW and normal birth weight babies (n= 243) were identify. Then the estimation gestational age in week at birth, history maternal complication during pregnancy were record onto data abstract sheet from ANC record. And also other maternal variable was collected including age, parity, gravidity and abortion. The relevant information was extracted from the records and these related to their socio demographic characteristics, obstetric history, laboratory investigation and perinatal outcome. All information was record on the data collection sheet.

##### 4.8.4 Data quality control measure

Training for data collector and supervisors were given by the principal investigator to make them familiar with the data collection tool. Then, the data collector checked card about their completeness and record on the quesinary paper . Supervisor of the data collector included observation ,how data collector was collected the data and record it had been done . the record questioner paper was check for completeness by data collector ,supervisor and principal investigeter. Even though ,any problem faced were discuss among team and solve accordingly. After data collection ,the collected data were cleaned,coded, and entered SPSS version 20.0.and presented by table.

#### 4.9 .Data processing and analysis

The data was entered by statistical package for social science [SPSS] software version 20.0.crude odd ratio and adjusted odd ratio were computed to asses the presence and degree of association between variable . the variable that analyze by binary logistic regression were entered to multiple logistic regression that have P-value < 0.2 .the logistic regression was used to assess the relative effect of independent variable on dependent variable.

#### 5. Ethical consideration

Ethical clearance was obtained from Debre Markos University, department of midwifery; permission was obtained from Debre Markos Referral Hospital and department head of the obstetrics ward for the utilization of the cards. Since, the card include the name of the mothers, confidentiality was maintained by making the data collectors aware not to record any identification found in the card.

#### 6. RESULT

##### 6.1 Socio-demographic Characteristics

In this study 243 mothers cards were included yielding 100% response rate. Out of 243 mothers 88[36.3%] of them were age group between 25-29 years.

Out of 243 mother 78(32.1%) of them were house wife, 42(17.3%) of them were farmer, 23(9.5%) of them were private employ, 44(18.1%) of them were merchant,23(9.5%) of them were daily labor and 33(13.6%) of them were governmental employ. In this finding majority 219 (90.1%) of mothers were orthodox Christian follower and 238(97.9%) of participant were Amhara regions.4 (1.6%) of them were oromia regions and 1(0.4%)

were Tigray region. Majority participant (91.4%) was married.

Out of 243 mothers 164(67.5%) of them were live in urban area, and 79(32.5%) of them live in rural area.

Table 8; Socio-demographic characteristics in Debre Markos referral hospital east gojjam, Ethiopia 2017.

Variable	Categories	Frequency	Percentage (%)
Age	15-19 year	10	4.1
	20-24 year	76	31.3
	25-29 years	88	36.3
	30-34 years	38	15.6
	35-39 years	19	7.8
	40-44 years	9	3.7
	45-49 years	3	1.2
Religion	Orthodox Christian	219	90.1
	Muslim	16	6.6
	Protestant	8	3.3
Ethnicity	Tigray	1	0.5
	Amhara	238	97.9
	Oromia	4	1.6
Occupation	-House wife	78	32.1
	-Farmer	42	17.3
	-Private employ	23	9.5
	-Merchant	44	18.1
	-Daily labor	23	9.5
	-Governmental employee	33	13.5
Marital status	Married	222	91.4
	Divorced	9	3.7
	Single	9	3.7
	Windowed	3	1.2
Residence	Urban	164	67.5
	Rural	79	32.5

## 6. 2. Neonatal characteristics

### Neonatal weight and sex

Out of 243 maternal cards, 64(26.3%) of new born were low birth weight i.e. below 2500 gram but 179(73.7%) of them were normal birth weight and above.

In this study 243 newborn cards were including from those 121(49.8%) of them were male neonate and 122(50.2%) were female neonate.

Table 9 Neonatal characteristics in Debre Markos referral hospital Amhara region, Ethiopia, 2017.

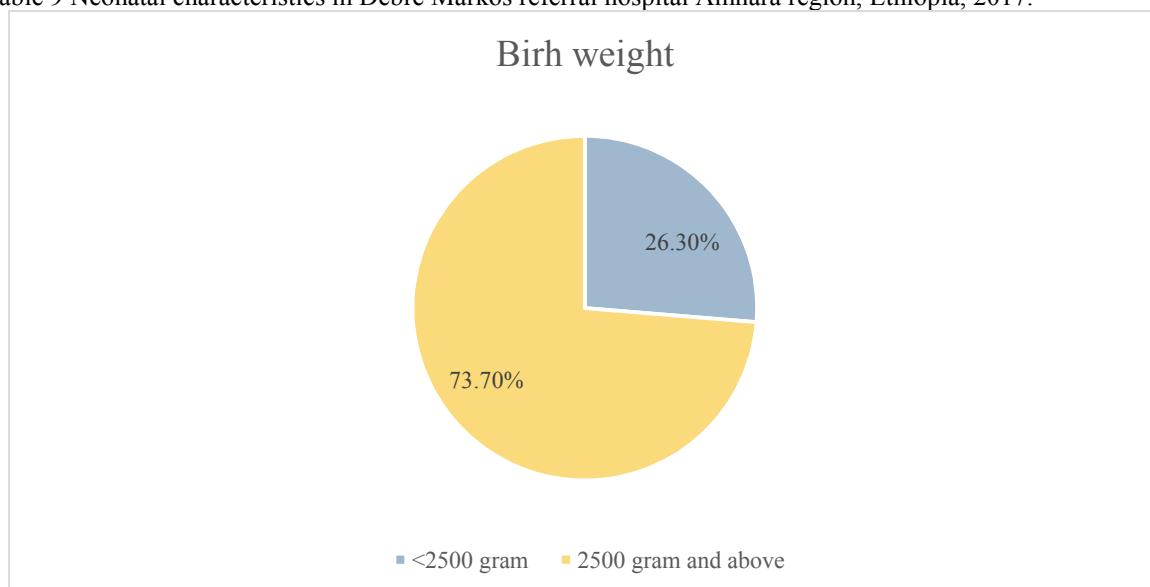


Figure. 2 Birth weight of newborns delivered in debre markos referral hospital, east gojjam, Ethiopia from June 1- August 25, 2017( 243 participants)

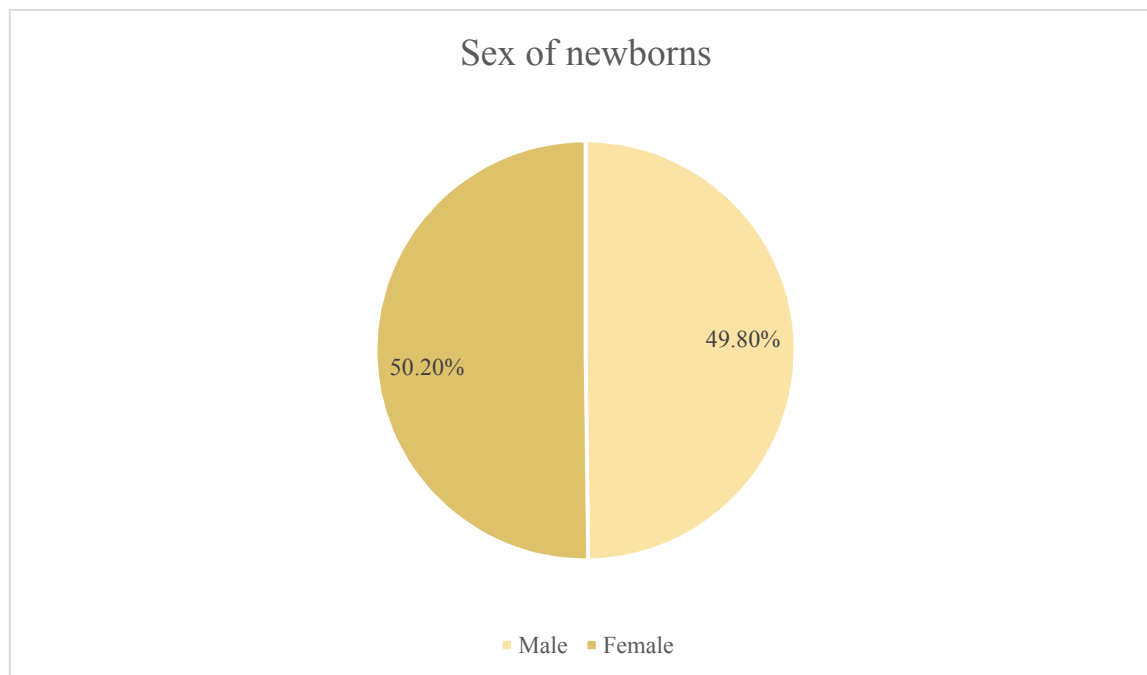


Figure. 3. Sex of newborns delivered in debre markos referral hospital, east gojam, Ethiopia from June 1- August 25, 2017( 243 participants)

### 6.3. Obstetrics Characteristics

In this finding, from 243 participants 73(30%) had gravida-1,157(64.6%) had 2-5 times become pregnant and 13(5.4%) had gravida-6 and above.

Out of 243 mother,95(39.1%) had 1-parity or prime-parity, 144(59.3%) had multi-parity and 4(1.6%) had 6 and above parity or grand-multi-parity. Since, majority of participant had multi-gravidity and multi-parity.

From the total of 243 participants 26(10.7%) had history of abortion whereas 217(89.3%) had no any history of abortion. From 26 mother that had abortion history, 22(9.1%) of them had 1-times aborted and 4(1.6%) of them had 2 and above times aborted.

Out of 243 mother in this finding show that 15(6.2%) of them had less than 50kg, 144(59.3%) of them had 50-60kg and 84(34.6%) of them had 61 and above kilogram during the last ANC visit.

In this finding majority of mother were delivered their neonates between gestational ages of 36-40 week. Out of 243 neonates, 51(21%) of them were delivered below and 36 weeks, 170(70%) of them are term and 22(9%) of them are post term. From the total neonates, 218(89.7%) of them were cephalic presentation and 25(10.3%) were breech presentation. Even though 191(78.6%) neonates were spontaneous vaginal delivery, 37(15.2%) of them were assisted vaginal delivery and 15(6.2%) of them delivered through caesarean section.

From the total 243 participants 214(88.1%) had ANC follow up and 29(11.9%) had no ANC follow up. Out of 214 ANC follow up mother 188(77.3%) of them had 1-2 times ANC visit and 26 (10.7%) of them had been 3 and above ANC follow up.

Out of 243 participants, 213(87.7%) of them were taken iron tablet and 30(12.3%) of them were no taken iron tablet during pregnancy. From 213 mother who had taken iron tablet, 50(20.6%) of them were taken for 30 days and below, 76(31.3%) of them were taken 31-60 days , 60 (24.7%) of them were taken 61- 90 days and 27[11.1%] of them were taken more than 90 days.

From the total of 243 participants, 9(3.7%) of them had chronic hypertension but 234(96.3%) of them had no chronic hypertension. And also 42(17.3%) of the mother had develop pregnancy induced hypertension but 201(82.7%) of them had no develop pregnancy induced hypertension.

Out of 243 mothers 236(97.1%) of them had no history of malaria but 7(2.9%) of them had a history of malarial diseases. During pregnancy 3(1.2%) were develop malarial diseases.

Out of 243 participants 36(14.8%) of them had anemia and 207(85.2%) of them had no anemia. But in this pregnancy, based on the level of hemoglobin 5(2.1%) of mother had severe anemia, 18(7.4%) of them were develop moderate anemia, 47(9.9%) of them were develop mild anemia and 173(80.6%) had normal hemoglobin level.

From the total of 243 mother 10(4.1%) of them had RH-negative but 233(95.5%) of them had RH-positive.out of243 Mather 5(2.1%) had HIV positive.



Table 10 ; Obstetrical characteristics among women delivered in Debre Markosreferral hospital, Amhara region, Ethiopia, 2017.

Variable	Classification	Frequency	Percent (%)
Gravidity	Prime- Gravida	73	30
	2-5 times pregnant	157	64.6
	6 times become pregnant and more	13	5.4
Parity	Prime-parity	95	39.1
	Multi-party	144	59.3
	Grand multiparty	4	1.6
Gestational age	<36 week	51	21
	37-40 week	170	70
	>40 week	22	9
ANC follow up	Yes	214	88.1
	No	29	12.9
Frequency of ANC visit	No ANC visit	29	11.9
	1-2 times	188	77.3
	3 times ANC visit	26	10.7
Iron supplementation	Yes	213	87.7
	No	30	12.3
Number of days taken	Not iron using	30	12.3
	30 day	50	20.6
	31-60 day	76	31.3
	61-90 day	60	24.7
	>90 day	27	11.1
Chronic HTN	Yes	9	3.7
	No	234	96.3
PIH	Yes	42	17.3
	No	201	82.7
malaria	Yes	7	2.9
	No	236	97.1
DM	Yes	8	3.3
	No	235	96.7
Anemia	Yes	36	14.8
	No	207	85.2
Degree anemia	Normal	173	80.6
	Mild anemia	47	9.9
	Moderate ANEMIA	18	7.4
	Severe anemia	5	2.1
Vaginal discharge during delivery	Yes	243	100
	no	0	0.00
Trauma during pregnancy	Yes	7	2.9
	No	236	97.1
Maternal weight	<50	15	6.2
	50-60	144	59.3
	>61	84	34.6
Rh-iso	Positive	233	95.9
	negative	10	4.1

#### 6.4 Maternal Life style

Out of 243 participants 55(22.6%) had history of drinking alcohol. From those mother, 11(4.5%) was drink daily,22(9.1%) were drink two times per week and 22(9.1%) were drink one times per week during pregnancy. Their is no history chat chewing and smoking during pregnancy and in the previous time.

### 6.5. Analysis of factor associated with of low birth weight

In this study 243 mothers card were included. Bi-variant logistic regression was done to identify the effect of independent variable on dependent variable (birth weight). During bi-variant analysis ,weight of mather,unwented pregnancy, gestational age during pregnancy', iron supplementation, neonatal sex, anemia, frequency of ANC visit and the presence and absence of ANC were associated with neonatal birth weight at p-value less than 0.2. This variable was entered to multi-variant logistic regression to avoid the confounding variable.

During multi- variant analysis gestational age, maternal weight inappropriate gain during pregnancy, ANC visit, hemoglobin and number days take iron tablet were significantly associated with low birth weight at p-value < 0.05. The gestational age less than or equal to 36 week were significantly associated with low birth weight (AOR=14.14, 95% CI= 5.838, 34.24, P-value=0.000. Mother whose gestational age less than 36 week have 14.14 times more likely to have low birth weight baby than mothers whose gestational age more than 37 week.

The maternal weight inappropriate gain during pregnancy in the last ANC visit was significantly associated with LBW (AOR=3.887, 95% CI= 1.498, 10.145, p-value =0.006. Study participant whose maternal weight increasing less than five kilogram have 3.887 times more likely to have low birth weight than participant with maternal weight increasing more than six kilogram. the mother who develop anemia during pregnancy were significantly associated with low birth weight (AOR= 0.129, 87.1%, 95% CI=0.16, 1.011, p-value=0.058) and low intake of iron tablet was significantly associated with neonatal birth weight (AOR=4.33, 95% CI=1.539, 12.22, p-value =0.006. But the other variable had no association between LBW in this study.

Table 11 ; Bi-variant and multi-variant analysis for low birth weight and its associated factor in Debre Markos referral hospital, Amhara region, Ethiopia, 2017

Variable	categories	Birth weight		COR(95% CI)	AOR(95% CI)	P-value
		Low	Normal and above			
<b>Sex of neonate</b>	<b>Male</b>	<b>25[20.7%]</b>	<b>96[79.3%]</b>	<b>1.804[1.008,3.228]</b>	<b>0.548[0.303,0.994]</b>	<b>0.047</b>
	<b>female</b>	<b>39[32.0%]</b>	<b>83[68.0%]</b>			
Gestational age	<=36	36(70.6%)	15(29.4%)	14.057[6.819,28.980]	14.14[5.838,34.247]	0.000
	>=37	28(14.6%)	164[85.4%]			
Take iron tablet during pregnancy	Yes	50[23.5%]	163[76.5%]	2.852[1.302,6.248]	0.408[0.030,5.502]	0.500
	NO	14[46.7%]	16[53.3%]			
What you think current pregnancy	Wanted	51[23.7%]	164[76.3%]	2.787[1.244,6.242]	0.578[0.202,1.653]	0.306
	Unwanted	13[46.4%]	15[53.6%]			
Have you ANC follow up	Yes	51[23.8%]	163[76.2%]	2.447[1.092,5.485]	1.176[0.096,14.339]	0.899
	no	13[44.8%]	16[55.2%]			
<b>How much ANC visit</b>	<b>&lt;=2[inadequate]</b>	<b>36[30.3%]</b>	<b>83[69.7%]</b>	<b>0.672[0.378,1.195]</b>	<b>0.285[0.111,0.728]</b>	<b>0.009</b>
	<b>&gt;=3[adequate]</b>	<b>28[22.6%]</b>	<b>96[77.4%]</b>			
How much weight increase during pregnancy	<=5[insufficient]	37[52.9%]	33[47.1%]	0.167[0.090,0.312]	3.887[1.498,10.145]	0.006
	>=6[sufficient]	25[15.8%]	144[84.2%]			
Number of days iron take	<=60[inadequate]	55[35.3%]	101[64.7%]	4.337[1.539,12.228]	4.337[1.539,12.228]	0.006
	>=61[adequate]	9[10.3%]	78[89.7%]			
<b>Cat hemoglobin level[anemia]</b>	<b>&lt;=10</b>	<b>2[20%]</b>	<b>8[80%]</b>	<b>0.583[0.316,1.075]</b>	<b>0.129[0.16,1.011]</b>	<b>0.054</b>
	<b>&gt;=11</b>	<b>38[23.3%]</b>	<b>125[76.7%]</b>			

### 7. Discussion

LBW is still remains significant cause of morbidity and mortality among neonates and children. Our study set out to establish the prevalence and risk factor for LBW among mother delivered inDebre Markos referral hospital. We found a LBW prevalence rate was 26.3%, which is higher than the prevalence rate of 14.6% reported from mixed study in Tigray region in 2015(19) and Gonder study with prevalence rate of 17.4%(21). LBW prevalence rate in our study is higher than the prevalence rate 9.9% and 6.3% study conducted in Axum and Lavlyeelymychew respectively (8). Compared to our study that abstracted birth weight from written records, the birth weight reported other study was obtained from multiple source including written records and subjective mothers estimate of birth weight for babiesdue to Educational statues, awareness ANC vist take care for health statues different at different area Previous studies conducted in kersa (11) and in depth analysis of EDHS 2011(18) were found slightly higher prevalence rate of 28.5% and 30.3% than our study respectively. The



observed difference could be reflection of probable variation in study population and neonates that included in study i.e. multiple neonates, congenital anomaly etc.

Inadequate ANC visit was risk factor for our study . the percentage of less than two ANC visit and greater than or equal to three visit i.e. 36[30.3%] and 28[22.6%] respectively. ANC visit less than two were 71.5% times more likely to be delivered LBW than those ANC visit three or more (OR, CI).

Female neonate was 0.548 times more likely risk to deliver LBW than male neonate at delivery. This study was similar with other study conducted in Debre Birhan and Gonder (2, 21).

In this study anemia [hemoglobin level] during pregnancy in last ANC visit were significantly associated with LBW. This anemia during last ANC visit was 0.129 times more likely to cause LBW than mother being hemoglobin level more than 11 gr/dl. This is to decrease the flow of blood towards to placenta and fetus because intake iron tablet less , educational status, residence area and occupation.

## 8. Limitation of the study

- As I had utilized secondary data, cards lack some variable. Hence, these variables were excluded from the study, which could have yielded better result.

## 9. Conclusion

The finding of this study concludes that the prevalence of low birth weight was 26.3%. The determinant factor for LBW were number of ANC visit, sex of neonate, and anemia [hemoglobin level].

## 10. Recommendation

The following recommendations were forwarded based on the finding of the study.

1. Give early detection and effective prevention for anemia during pregnancy to reduce low birth weight Debre Markos referral hospital.
2. Prevention low birth weight by creating awareness the need of ANC visit to pregnancy mother.
3. Other researchers should conduct further research to generalize factor associated low birth weight Debre Markos referral hospital.
- E. Advice ANC follow-up mother about nutrient, decrease strenuous activity during pregnancy and taken adequate rest to prevent underweight during pregnancy.
- F. It also recommend to Debre Markos health institution, regional and federal health service to encourage health professional to teach about the risk factor for low birth weight and its complication as well as to improve the health strategy in order to reduce the highest neonatal mortality rate related to low birth weight.

## 11. Acknowledgement

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## 12. Competing interests

The authors declares that they have no competing interests

## 13. Authors' contributions

Habtam Chanie wrote the proposal, participated in data collection, analyzed the data and drafted the paper. Abebe Dilie approved the proposal with some revisions. Both authors revised subsequent drafts of the paper and approved the final manuscript.

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