MAGNITUDE AND FACTORS ASSOCIATED WITH LOW BIRTH WEIGHT AMONG WOMEN DELIVERED IN PUBLIC HOSPITALS OF BENCH MAJI, KEFFA AND SHEKA ZONES SOUTH WEST OF ETHIOPIA, 2018

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ABSTRACT

BACKGROUND: The burden of low birth weight has decreased dramatically worldwide in the past 40 years. Despite this, there is still a large gap between the developing and developed countries. Ethiopia is one of the developing countries with limited data on the prevalence and main risk factors of low birth weight. Therefore; providing information on this problem is very important for planning maternal and child health care services.

OBJECTIVE: To assess the magnitude and factors associated with low birth weight among women delivered at Mizan-Tepi university teaching hospital, Tepi general hospital, Wacha hospital and Gebretsadik Shawo hospitals Southwest, Ethiopia, 2018.

METHODS: A cross-sectional study was conducted at selected hospitals on all women who gave birth during study period. Data was entered to Epidata version 3.1 and exported to SPSS version 20 for analysis. Logistic regression analysis was carried out to identify associated factors at confidence interval of 95% and significance level of P-value<0.05.

RESULT: The magnitude of low birth weight was 7.5%. Educational status of the mother [AOR 3.6, 95% CI (1.46-8.92)], iron intake during pregnancy [AOR 2.88, 95% CI (1.37-6.05)], Current pregnancy complication [AOR 5.98, 95% CI (3.37-10.62)], induced labor [AOR 2.37, 95% CI (1.08-5.12)] and gestational age [AOR 37.61, 95% CI (20.61-68.56)] were significantly associated factors with low birth weight.

CONCLUSION: The magnitude of low birth weight was found to be high in the study area. Educational status of the mother, iron intake during pregnancy, pregnancy complication, induced labor and gestational age were identified predictors of low birth weight.

KEY TERMS: Low Birth Weight, Pregnancy, Delivery, Women.

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INTRODUCTION

Low birth weight (LBW) is an important adverse outcomes of pregnancy as it is significant in determining neonatal morbidity and mortality, inhibited growth and cognitive development, and chronic diseases later in life1. Family members and professionals who provide prenatal, maternity or postpartum cares are likely to confront an unexpected adverse birth outcome like low birth weight during their professional career2.

Low birth weight (LBW) is defined by the World Health Organization (WHO) as weight at birth less than 2500g. It might be classified as low birth weight (birth weight <2500g), very low birth weight (birth weight <1500g) and extremely low birth weight babies (birth weight < 1000 g)3-6.

Low birth weight is the highest among the adverse pregnancy outcomes and common in developing countries contributing to 60% to 80% of all neonatal deaths worldwide and estimated that 18 million low birth weight babies born attributing to nearly 14% of all live births7,8.

The level of low birth weight is estimated to 16.5% in developing countries which is two-fold higher than the level observed in developed countries 7 %9.

Low birth weight infants run the risk of developing many complications includes respiratory distress, sleep apnea, heart problems, jaundice, anemia, chronic lung disorders, and infections are just some of the obstacles that low birth weight babies may face. In addition, it places financial and emotional burdens on families and communities10.

Like other developing countries, in Ethiopia low birth weight is still major public health problem. However, studies on this area are not sufficient. Therefore, this study aimed to assess magnitude and factors associated with low birth weight among women delivered in the study area.

METHODS AND MATERIALS

Study area and period

The study was conducted in public hospitals found in Bench Maji, Sheka and Keffa zones namely, Mizan Tepi University teaching hospital, Tepi general hospital, Wacha hospital and Gebretsadik Shawo hospital from February 01- March 30, 2018. Mizan Tepi University Teaching Hospital (MTUTH) is located in Bench Maji zone, 560 kms away from Addis Ababa. The two hospitals: Gebretsadik Shawo and Wacha hospitals are found in kefa zone at a distance of 441 and 520 kms away from Addis Ababa respectively, while Tepi general hospital is located in Sheka zone, 565 Kms away from capital city of Ethiopia, Addis Ababa11.

Study Design

Facility based cross-sectional study design with quantitative data collection method was used.

Source and study population

All mothers who delivered in the four hospitals were considered as source of population and those who gave birth during the study period were considered as study population.

Inclusion and exclusion criteria

All laboring mothers who gave birth at MTUTH, Tepi, Gebretsadik Shawo and Wacha public hospitals were included in the study; however multiple birth, mothers who were critically ill and unable to communicate during data collection were excluded from the study.

Sample Size Determination

The sample size was calculated by using a single population proportion sample size calculation formula considering the following assumptions. d = margin of error of 2% with 95% confidence interval, p=proportion expected prevalence of adverse birth outcome are 25% and considering none response rate of 10%. Then the final sample size became 1980.

Sampling Technique

The total sample size (1980) was allocated to the four public hospitals. The sample size allocation was based on the source of population from each hospital. The source of population of each hospital was taken from six month report of deliveries. Then the average was considered as source of population. The study participants were consecutively interviewed from each hospital until the calculated sample size achieved.

Operational definitions and Definition of terms

Low birth weight: is defined as a birth weight below 2500 grams.

Baby weight: The weight of a neonate taken right after birth and/or within first hour after home delivery using ordinary baby weight scale.

Data collection Instruments

The data was collected using pre-tested structured questionnaire and anthropometric measurements. The English version of questionnaire was developed based on instruments applied in different related studies [12-16] then translated in to Amharic by experts and then translated back to English to check for consistency. This questionnaire contains different sections for assessing low birth weight, demographics and associated factors.

Data collectors

Twelve midwives with BSc degree were recruited purposefully as data collectors from their respective facilities for which they caring to maintain the quality of the data. Four MSc holders in fields of health were recruited as a supervisor.

Data Collection Procedure

Data was collected through face to face interview, measurements and reviewing of medical record of the mother and newborn using pre-tested structured questionnaire and check list by trained data collectors. Data was collected day and night not to miss the cases. Last normal menstrual period (LNMP) was confirmed from her chart and client report. Gestational age was calculated based on the last normal menstrual period (LNMP). When LNMP-based gestational age is unknown, we relied on ultrasonography measures from chart.

Data Processing and Analysis

EPI data Statistical software version 3.1 and Statistical Package for Social Sciences (SPSS) software version 21.0 was used for data entry and analysis. After organizing and cleaning the data, different descriptive statistics were calculated to all variables related to the objectives of the study. Likewise, variables with P- value of less than 0.25 in binary logistic regression analysis was entered into the multivariable logistic regression analysis to control confounders to determine the separate effects of the various factors associated with low birth. Odds ratio with 95 % confidence interval was used to examine associations and variable with P value less than 0.05 was considered significant. Finally the result was presented by using tables, charts and narrative form.

Data Quality control measures

The data quality was assured by using validated pre-tested questionnaires. Consequently, actual was collected on 5% of the total study eligible subjects with similar characteristics at Mizan Health Center. Finally the necessary amendments were made to the tool. The validity of the tool was checked by face validity. Data collectors were trained for two days intensively on the study instrument and data collection procedure that includes the relevance of the study, objective of the study, confidentiality of the information, informed consent and interview techniques. The data collectors worked under close supervision. Supervisors reviewed the filled questionnaires at the end of data collection every day for completeness. There was regular morning session to discuss on potential and faced problems to take timely corrective actions. Moreover, the data was carefully entered and cleaned prio to the beginning of the analysis.

Ethical Considerations

A letter of approval was obtained from Mizan-Tepi University and further permissions were taken from respective Medical Directors of the selected health facilities. After explaining the objectives of the study in detail, informed written consent was taken from all study participants promising that everything will be kept private.

RESULT

Socio-demographic characteristics

The response rate for the study was 100%. Around half 905(45.7%) of the participants were from rural area, and one fourth 505(25.5%) of the study participants were unable to read and write. Most of the respondents 1911(96.5%) were married and majority 1562(78.9%) of them were house wife regarding their occupation (Table 1).

Table. 1. Socio-demographic characteristics of women delivered in public hospitals of Benchi-Maji, Kaffa and Sheka zones, Southwest Ethiopia, 2018.

Variables	Category	Frequency	Percent (%)
Age	15-19	178	9
	20-24	854	43.1
	25-29	585	29.5
	30-34	230	11.6
	35+	133	6.7
Residence	Rural	905	45.7
	Urban	1075	54.3
Educational status	Unable to read and write	505	25.5
	Able to read write	413	20.9
	Primary education	643	32.5
	Secondary education	263	13.3
	College and above	156	7.9
Marital status	Married	1911	96.5
	Single	40	2
	Divorced	7	0.4
	Widowed	10	0.5
	Separate	12	0.6
Religion	Orthodox	897	45.3
	Muslim	404	20.4
	Protestant	679	34.3
Occupation	Housewife	1562	78.9
	Merchant	177	8.9
	Gov't employee	126	6.4
	Non-gov't employee	22	1.1
	Daily labor	93	4.7

Table. 2 Obstetric characteristics of women delivered in public hospitals of Benchi-Maji, Kaffa and Sheka zones Southwest, 2018.

Variables	Category	Frequency	Percent (%)
APregnancy status	Intended	1888	95.4
	Unintended	92	4.6
ANC follow-up	Yes	1826	92.2
	No	154	7.8
Iron supplement	Yes	1664	84
	No	316	16
Complication during current pregnancy	Yes	266	13.4
	No	1714	86.6
Hypertensive disorders of pregnancy	Yes	90	33.8
	No	176	66.2
APH	Yes	54	20.3
	No	212	79.7
Gestational age	<37weeks	182	9.2
	≥37	1798	90.8
Complication during current labor	Yes	385	19.4
	No	1595	80.6
Status of current labor	Spontaneous	1737	87.7
	Induced	243	12.3
Alive birth	Yes	1801	91
	No	179	9
Birth weight	<2500gm	148	7.5
	≥2500gm	1832	92.5
Anemia (using Hgb)	Yes	378	19.1
	No	1602	80.9
Nutritional status (using MUAC)	Under nutrition	546	27.6
	Normal	1434	72.4

Obstetric characteristics

From the total study participants almost all 1888(95.4%) of the pregnancy were intended. Majority 1826(92.2%) of the participants have antenatal care (ANC) follow-up and also 1664(84%) respondents supplemented iron during current pregnancy. Regarding complication 266(13.4%) and 385(19.4%) mothers developed complication during pregnancy and delivery respectively. Majority 1737 (87.7%) of the participants' onset of labour were spontaneous and only 378 (19.1%) of the participants had anemia during labour and child birth (Table 2).

Magnitude of low birth weight

The magnitude of low birth weight in this study was 148 (7.5%) with 95 % CI (6.3-8.7%). The mean value of low birth weight was 3.3kg with standard deviation of ± 5.6 kg.

Factors associated with low birth weight

Mothers who can write and read were three times more likely to have low birth weight as compared to mothers with educational level secondary and above [AOR 3.6, 95% CI (1.46-8.92)]. Mothers who didn't take iron during pregnancy were three times more likely to have

low birth weight as compared to their counterpart [AOR 2.88, 95% CI (1.37-6.05)].

Mothers who develop complication during pregnancy were six times more likely to have low birth weight as compared to normal pregnancy [AOR 5.98, 95% CI (3.37-10.62)]. Mothers with induced labor were two

times more likely to have low birth weight as compared to spontaneous labor [AOR 2.37, 95% CI (1.08-5.12)]. Mothers who have preterm delivery were thirty seven times more likely to have low birth weight as compared to their counterpart [AOR 37.61, 95% CI (20.61-68.56)] (Table-3).

Table. 3: Factors associated with low birth weight among mothers who delivered in public hospitals of Benchi-Maji, Kaffa and Sheka zones Southwest, 2018.

Variable	Category	Low birth weight		COR(95% CI)	AOR (95% CI)
		Yes	No		
Residence	Rural	93	812	2.12(1.50-3.00)	1.05(0.56-1.96)
	Urban	55	1020	1	1
Educational status	Can't read & write	51	454	3.03(1.68-5.46)	0.75(0.27- 2.10)
	Read and write	36	377	2.57(1.39-4.77)	3.61(1.46-8.92)*
	Primary education	46	597	2.08(1.14-3.77)	1.77(0.70-4.22)
	Secondary school and above	15	404	1	1
History of medical illness	Yes	11	288	0.43(0.23-0.81)	0.57(0.25-1.30)
	No	137	1544	1	1
ANC follow up	Yes	105	1721	1	1
	No	43	111	6.35(4.24-9.51)	0.56(0.21-1.55)
Intake Iron folate	Yes	64	1600	1	1
	No	84	232	9.05(6.36-12.89)	2.88(1.37-6.06)*
Current pregnancy complications	Yes	75	191	8.83(6.19-12.60)	5.98(3.37-10.62)*
	No	73	1641	1	1
Current delivery complication	Yes	41	344	1.66(1.14-2.42)	0.60(0.35-1.12)
	No	107	1488	1	1
Status of current labour	Spontaneous	111	1626	1	1
	Induced	38	205	2.65(1.77-3.94)	2.37(1.08-5.20)*
Nutritional status	Normal	79	467	1	1
	Under nutrition	69	1365	3.35(2.38-4.70)	0.95(0.53-1.70)
Anemia (using HGB)	Yes	64	314	3.68(2.60-5.21)	1.80(0.98-3.28)
	No	84	1518	1	1
Gestational age	37 and above weeks	43	1755	1	1
	Less than 37 weeks	105	77	55.66(36.50-8487)	37.61(20.63-68.58)*

*= Statistically significant, 1= Reference category

Discussion

Low birth weight is public health concerns throughout the world. Developing countries are with the highest rates of this adverse birth outcome. In this study, the magnitude and associated factors of low birth weight

was assessed among women delivered at hospitals found in Bench Maji zone,Kefa and Sheka zone.

This study revealed that the magnitude of low birth weight in the study area was 7.5% with 95% CI (6.3-8.7%). The finding of the study was similar with the

previous studies done in Tanzaniza 8% and Hosana (8.6%) [13,16]. This finding is lower than the studies conducted in Gambia (10.5%) [17], Kenya (12.3%) [18], Tigray (14.6%) [19], Adawa general hospital (10%) [20], Gondar university hospital (11.2%) [14] and Gondar Public health institution (17.4%) [15]. The difference might be due to study period: currently increased antenatal care coverage and health seeking behavior of mothers before and during pregnancy helps in early detection and treatment of pregnancy and non-pregnancy related problems might decrease the chance of getting LBW. Increasing antenatal care utilization at national and regional level gives a chance for pregnant mothers to get advice on danger sign, diet, rest and personal hygiene that can lowers low birth weight. The other possible reason for the lower magnitude of low birth weight in this study might be due to improved socio-economic status of the community from time to time which has direct or indirect impact on fetal weight during pregnancy.

Even though the prevalence of low birth weight in this study is lower than other study in the country, it needs the professionals' intervention like effective counseling about fetal growth and development, dietary and danger signs preconception as well as during pregnancy to prevent problem which result short and long term fetal problems.

This study revealed that educational status of the mother, pregnancy complication, and iron supplementation during pregnancy, induced labor and gestation age of the neonate were significantly associated with low birth weight. This finding is consistent with studies conducted in China, India, Nigeria, Tanzania, Gambia, Gondar and Hossaina [15-17, 21-24]. Mothers who develop pregnancy complication were six times more likely to have low birth weight as compared to their counterpart. This may be due to the fact that pregnancy complication can force to terminate the pregnancy before term and result in low birth weight. This finding is consistent with studies conducted in China, India, Gambia and Gondar [15, 17, 21, 22]. This finding is also in line with the studies conducted in Adawa general hospital and Kenya (18, 20). Mothers who didn't intake iron were

more likely to have low birth weight. This may be due to low hemoglobin level and low formation of erythrocytes results in low supply of oxygen to the fetus. Low oxygen concentration supply may affect fetal metabolism and result in low birth weight.

Even though in Ethiopia under five children death is in declining trend, neonatal death remained high. Low birth weight is one of the causes of neonatal death and long term complication. So, health care providers should focus on provision of iron supplementation and prevention of pregnancy complication. In addition to this, based on the educational status, care providers should give clear information about danger sign of pregnancy, diet, personal hygiene and iron folate supplementation every antenatal visit.

In general from this study it can be concluded that the magnitude of low birth weight in the study area was found to be high. Educational status of the mother, iron intake during pregnancy, pregnancy complications, induced labor and gestational age were factors significantly associated with low birth weight. The effort of regional health bureau, zonal health departments and district health offices is important in improving nutritional status of the mothers, prevention and management of obstetric complications and also the obstetric care providers should give an attention on early diagnosis and management of maternal complications during pregnancy to reduce the rate of LBW.

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