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Alcohol Addicted pregnant women and it effects on low birth weight, associated factors among Neonates in public hospitals, Addis Ababa, Ethiopia

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Abstract

Background: The great majority of low-birth-weight births occur in low- and middle-income countries. Especially in the most vulnerable populations in sub-Saharan Africa including Ethiopia.

Objective: Study was aimed to assess low birth weight and factors associated with low birth weight among neonates in public hospitals in Adiss Abeba.

Method: Institution-based cross-sectional study design was conducted to assess the prevalence and associated factors of low birth weight among newborn babies in public hospitals in Addis Ababa, Ethiopia. The data was collected using an interviewer-administered structured questionnaire. The collected data was cleared and entered into EPI info version 7and .0 and then exported to spss version 20. bi variate and multivariate logistic regression analyses were employed to identify associated factors with low birth weight. After bivariate regression analysis, variables with a P value less than 0.2 were included in multivariable logistic regression. An unadjustedd ratio with 95% CI was calculated to see the association of vvavariablesth low birth weight at the sinsignificant value of P<0.05.

Result: The study was conducted among 369 mothers who had a new born baby.And in this study, the prevalence of low birth weight was 15.2% at 95%CI=(11.7-18.7).And residing in rural area AOR=2.50(95%CI=(1.078-5.148),Birth interval <24 month AOR=2.531 95%CI=(1.422-.4.507),Pregnancy complication AOR=13.53095 % CI =(6.080-30.105),ANC follow up (AOR = 5.14(95 % CI=(1.260-21.017)).gestational age AOR 7.446(95%+CI=(3.104-17.862),sex of the new born AOR=3.24(95%CI=(1.354-7.7561) were significantly associated factors.

Conclusion: The prevalence of low birth weight in this study was 15.2%, and it is lower than the national prevalence, And residential are, Birth interval, pregnancy complications, ANC followup,gestational age and sex of neonates were significantly associated with low birth weight.

Keywords: Low Birth Weight; Factors; Neonate; Ethiopia

Introduction

Birth weight is the first weight of the fetus or newborn obtained after birth. For live births, birth weight should preferably be measured within the first hour of life, before significant postnatal weight loss has occurred [1]. According to World Health Organization (WHO) defined, Low birth weight is weight at birth less than 2500 g [2] LBW can be further subcategorized as very low birth weight (VLBW) and extremely low birth weight (ELBW)or very low birth weight (VLBW), which is less than 1500 g. and extremely low birth weight (ELBW), which is less than 1000 g [3]. It is a serious public health problem that has been linked to a substantial increase in the risk of mortality and morbidity [4] can be caused by either due to preterm birth (born before 37 weeks of gestation) or the infant being small for gestational age (slow prenatal growth rate) or a combination of both [5].

Birth weight is one of the important indicators to predict the future health and survival of new-born [6]. Infants with low birth weight are at higher risk of dying during their early months and years,in spite being born with LBW is generally recognized as a disadvantage for the infant and LBW infants are at higher risk of early growth retardation, infectious diseases, developmental delay and death during infancy and childhood [7,8].

Low birth weight is more common in developing than developed countries; a birth weight below 2,500 g contributes to a range of poor health outcomes. Those who survive have impaired immune function and increased risk of disease; they are likely to remain undernourished, with reduced muscle strength [9].

The great majority of low-birth-weight births occur in low- and middle-income countries and especially in the most vulnerable populations, Regional estimates of low birth weight include 28% in South Asia, 13% in sub-Saharan Africa and 9% in Latin America [10]. According to the Ethiopian Demographic and Health Survey, the prevalence of low birth weight in Ethiopia is 13% [11].

In Ethiopia under-five mortality rate decreased from 91 deaths per 1,000 live births in 1990 to 43 per 1,000 in 2015. However, the decline in neonatal mortality from 1990 to 2015 was slower than that of post neonatal under-five mortality [12]. In Ethiopia, low birth weight is a major public health problem since low birth weight is one of the leading

causes of neonatal mortality and morbidity progress of sustainable development goals will be dependent on achieving high coverage of evidence-based interventions that decrease low birth weight and improve survival of newborns [13].

Methods and Materials

Study area and study period

Institution-based cross-sectional study was conducted from November1, 2021, to January, 2022 in Yekatit 12, Gandhi memorial and Ras desta Damtew hospital in Addis Ababa city and they were selected by simple random sampling metheods. And Addis Ababa has 11 subcities containing 117 woredas at an altitude of 7,546 feet (2,300metres). There are five hospitals owned by Addis Ababa Health Bureau, 4 by Federal Ministry of Health, one is under the ministry of Education (AAU), two by the defense force according to Addis Ababa city health office. Those three selected hospitals give delivery service and two of them except Ras Desta hospital have neonatal intensive care unit according the data of Human resource management of each hospital [14].

Source population

All newborn babies delivered in Adiss Abeba city Public Hospital were the source population.

Study participant

All randomly selected newborn babies delivered in Adiss Abeba city Public Hospital during the study period were included.

Inclusion Criteria

All mothers who delivered live newborns during the study period was included in the study.

Exclusion criteria

Multiple births, mothers, or newborns in critical medical conditions were excluded.

Sampling procedure

The study was conducted in three randomly selected public hospitals of Addis Ababa, Ethiopia, from November 2021to January 2022. Total sample sizes of 369 newborn babies was selected from three health institutions. The numbers of newborn/mother pairs surveyed from each health institution were allocated proportionally based on the expected number of deliveries in the study period, which was estimated using the number of l last one month in each health institution [15].

Data collection procedure

Data was collected by using a pretested, semi-structured questionnaire with an interview type of data collection method, medical record was cross-checked to confirm important variables such as patient obstetrics history and antnatal history.The question were prepared in English and translated into Amharic language. The interview was in Amharic language, a commonly used local language.

Data collectors and supervisors

Data collector and supervisor was trained for two days on the objective of the study, relevance of the study procedure during interviewing, confidentiality of client information, eligibility criteria, respondents right informed consent, and ways of approach during interview. Two Nurses who are currently working in the hospital were used as data collectors. The data collection process was closely supervised, and the completeness of each questionnaire was checked daily by the principal investigator, and a logical checking technique was employed to identify errors, finally, double data entry will be performed to check the consistency of the data.

Operational definition/and measuring scale

Low birth weight: is weight at birth less than 2500 g.

Preterm birth: delivery before 37 completed weeks of gestation.

Very low birth weight: birth weight which is less than 1500 g

Data entry and analysis

All filled questionnaire were checked for completeness, consistency, and accuracy. Data was cleaned and entered using EPI data (7.0) and then exported to version 20SPSS software. Descriptive statics were used to determine frequencies, percentages, means (SD), (table, pie chart) were used to describe the study population in relation to the relevant variables. Bivariate logistic regression was used to check variables having association with the dependent variables. Then those variables found to have p-value less than 0.2 were fitted to multvariete logistic regression for controlling the effect of confounders. Odds ratio with their 95% of CI was computed and variables having p-value less than 0.05 in the multiple logistic regression models were considered as significantly associated with the dependent variable and model fitness were checked by Hosmer Lemeshow goodness-of-fit test.

Results

Socio-demographic factors of respondents

A total of 369 new born baby mothers participated in the study constituting a response rate of 100%.More than half of the respondents (63.4%) were found in the age group of 20-35.More than three-quarters of the mother 342(92.7%) were married and 52.6% of the mother were urban residence. Regarding maternal educational status, 140(37.9%) of the respondents were primary education and almost half of them (49.9%) were house wives (Table 1).

Maternal factors

Half 187(50.7%) of the respondents were prim parous and one hundred thirty (30.6)of the respondents were multi parous.Two

Table 1: Socio-demographic factors of the mothers in Addis ababa city Public Hospitals, Addis Ababa, Ethiopia, 2021/2022.

Variable N=369	Categories	Frequency(N)	Percent%
Age of the mother	<20	66	17.9
	20-35	234	63.4
	35-49	69	18.7
Maternal educational status	No formal education	69	18.7
	primary education	140	37.9
	secondary education	124	33.6
	university &above	36	9.8
Residence	Rural	175	47.4
	Urban	194	52.6
Marital status	living alone	27	7.3
	Married	342	92.7
Mothers occupation	House wife	184	49.9
	Merchant	35	9.5
	Gov't employee	107	29.0

hundred forty-one (65.3%) of the respondents were categorized above or equal to two-year with regard to birth interval and 128(34.7%) of the respondent were below 24 month birth interval. Two hundred ninety-four (79.7%) pregnancies were intended. Three hundred thirty (89.4%) have no history of low birth weight. With regard to current pregnancy complication only 58(15.7%) developed a complication. Three hundred fourth seven (94.0%) of the mothers were having ANC follow-up. Of which182 (49.3%)had four and above ANC follow-up (Table 2).

Nutritional status and behavioral factors

Two hundred fourthy nign (67.5%) of the mothers were counseled about dietary intake during antenatal care follow-up. Two hundred twenty-two (60.2%)of them took an extra meals during pregnancy. Three hundred fifty-nine (97.3%) of the respondents did not smoke during pregnancy. Regarding alcohol drinking, three fifty (85.4%) of the respondents did not drink alcohol during their pregnancy. Additionally, eighty(4.9%) of the mothers had chewed chat during pregnancy (Table 3).

Low birth weight and other health condition of newborns

Among the three hundred sixty nign newborns 213(57.7%) were females and 156(42.3) were male newborn. 19(5.1) of the new born babies had visible birth defect. The prevalence of low birth weight among newborn babies in Adiss Abeba city Public Hospitals was found 15.2% at 95%CI=(11.7-18.7) (n=369) (Figure 1).

Factors associated with low birth weight

In multivariate logistic regression analysis, place of residence,

Table 2: Maternal factors of the respondent in Addis Ababa city Public Hospitals, Addis Ababa, Ethiopia, 2021/2022.

Variable(N=369)	Category	Frequency(N)	Percent(%)
Parity	none	69	18.7
	<=2	187	50.7
	>=2	113	30.6
Birth interval (in months)	<=24	128	34.7
	>24	241	65.3
Desirability of pregnancy	Yes	294	79.7
	No	75	20.3
Current pregnancy complication	Yes	58	15.7
	No	311	84.3
Types of pregnancy complication	None	311	84.3
	APH	18	4.9
	PROM	23	6.2
	PIH	17	4.6
History of low birth weight	Yes	39	10.6
	No	330	89.4
Medical illness for the current	Yes	15	4.1
Pregnancy	No	354	95.9
Types of medical illness	None	354	95.9
	Diabetes	9	2.4
	HTN	3	0.8
	HIV/AIDS and	3	0.8
	other		
Malaria infection	Yes	20	5.4
	No	349	94.6
STI for the current pregnancy	Yes	8	2.2
	No	361	97.8

Table 3: Nutritional and behavioral factors of the respondents in Addis Ababa city Public Hospitals, Addis Ababa, Ethiopia, 2021/2022.

Variables(N=369)	Categories	Frequency(N)	Percent(%)
Dietary counseling	Yes	249	67.5
	No	120	32.5
Additional nutrition	Yes	222	60.2
during pregnancy	No	147	39.8
Cigarette smoking	Yes	10	2.7
	No	359	97.3
Alcohol drinking	Yes	54	14.6
	No	315	85.4
Chat chewing	Yes	18	4.9
	No	351	95.1
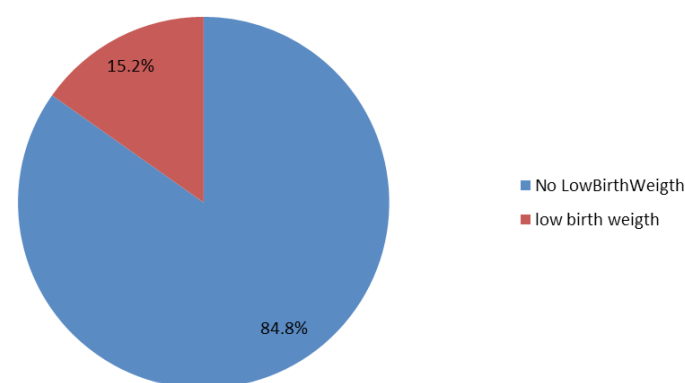
Figure 1: The prevalence of low birth weight among new born babies in Addis Ababa city Public Hospitals, Addis Ababa, Ethiopia2021/22.

pregnancy interval, pregnancy complications, gestational age, antenatal care, follow-up during pregnancy, and sex of the new-born baby were found to be independent predictors of low birth weight.

Residence of the mother was strongly associated with low birth weight; mothers living in rural areas were 2.5 times more likely to have LBW babies when compared to those mothers who lived in urban(AOR=2.50(95%CI=(1.078-5.148).

Mothers who had a pregnancy interval <24month where 2.5 times more likely to have LBW babies when compared to those Mothers >24 month pregnancy interval (AOR=2.531, 95% CI = (1.422-4.507). Mothers who had a pregnancy complications were 13 times more likely to have LBW babies when compared to those mothers who do not have a pregnancy complications (AOR=13.530, 95% CI =(6.080-30.105). New born babies were 5 times higher to develop LBW in mothers who had no antenatal care during pregnancy when compared to mothers having antenatal care follow up (AOR = 5.14(95% CI =(1.260-21.017) and who were delivered before gestational age of 37 weeks were 7 times higher to develop low birth weight When compared to babies born at gestational age of 37 weeks and more (AOR = 7.446(95% +CI = (3.104-17.862). Additionally, female new born babies were three times more likely to have LBW than their male counter parts (AOR=3.24(95%CI=(1.354-7.7561) (Table 4).

Discussion

The finding of this study showed that 15.2% of new-borns were birth weight < 2500 g. rural place of residence, birth interval <24 months, lack of ANC, follow-up, pregnancy complications, preterm birth (gestational age <37 weeks) and being female new born were significantly associated variables to LBW.

Table 4: Factors associated with low birth weight of neonates (n=369).

Variable (N=369)	Category	LBW		AOR[95% CI]
		Yes(%)	No(%)	
Residence	Rural	21(12.0)	154(88.0)	2.503(1.078-5.148)*
	Urban	35(18.0)	159(82.0)	
Birth space(in months)	<=24	30(23.4)	98(76.6)	2.531(1.422-.4.507)*
	>24	26(10.8)	215(89.2)	
Current pregnancy Complication	yes	32(55.2%)	26(44.8)	
	No	24(7.7%)	287(92.3)	13.530(6.080-30.105)*
ANC follow up	Yes	46(13.5%)	296(86.)	5.146(1.260-21.017)*
	No	10(37.0%)	17(63.0)	
Gestational age	<37	25(41.7%)	35(58.3)	
	>=37	31(10.0%)	287(90.0)	7.446(3.104-17.862)*
Sex of newborn	Female	44(20.7%)	144(92.3)	3.242(1.354-7.7561)*
	Male	12(7.7%)	169(79.3)	
Hosmer lemeshow goodness-of-fit is fit at 0.894% *=Statistically significant at p value <0.05 with 95%CI				

The prevalence of low birth weight was 56(15.2%) at 95%CI = (11.7-18.7) this finding was consistent with study's conducted in dessie town referral hospital which was a study's conducted in wolita sodo teaching and referral hospital. This similarity might be due to both reference population living in the same geographical area, study Time and The same socio economic stutus.

The reported value is higher than the study finding done in Colombia 8.7% (17)., Nigeria 6.3%. LBW in Burkina Faso, Ghana, Malawi, and Uganda ranges from respectively, 13.4%, 10.2%, 12.1%, and 10%. South west iran9.4%. This difference might be due to difference in study time, difference in socio economic, differences in the study population, sample size, and handling of potentially confounding variables.

However the prevalence of LBW in this was found to be lower than studys doned in Wolita Sodo 15.8%, Harar 23.3%, Hadiya zone 17.4%, Wello 17.4%. Dire dawa 21%, Dilla 34.1%, Ethiopia 17.3%, Gojjam 26.3%. This might be due to variation in characteristics of socio-demographic, economic, health care seeking behavior, study setup,study time,study population.

This study indicated a significant difference among urban and rural resident mothers regarding delivering a low birth weight babies. Mothers who reside in rural were higher odds of delivering a low birth weight babies compared to urban residents. This result is in line with studys done Tigraye city Northern Ethiopia. Study conducted in Dilla Town. and a study conducted in debre tabor Hospital, amhara regional state Ethiopia . and A studys conducted at hospitals in Kambata-Tembaro zone, southern Ethiopia. A possible reason would be people in rural live, a life characterized by greater hardship due to low infrastructure, harder physical work, and less access to basic services than the urban . And it might also be due to the accessibility of health services, health information, and nutritional awareness which were more prominent as the women resided in urban areas than rural areas. Moreover, female newborns were more likely to be low birth weight compared to male newborns. This study is comparable with studies done in Ataye primary hospital. A study conducted on Prevalence of Low Birth Weight and Associated Factors among Women Delivered in Debre Markos Referral Hospital, East Gojam, and Ethiopia. A study conducted in gonder Town. Studies conducted in IRAN. The possible

explanation would be that female fetuses are insulin resistant than boys so that females would not use glucose properly as males during the intrauterine period.

Limitations of the study

In this study, the inability to include mothers who delivered at home. And Private health facilities were not included, which might undermine the generalizing result to the general population.

Conclusion

This study shows that the prevalence of LBW in Adiss Abeba town governmental hospital, Adiss Abeba, Ethiopia, was found to be 15.2%.

It was found to be affected by rural place of residence, birth interval <24 months, lack of ANC, follow-up, pregnancy complications, preterm birth (gestational age <37 weeks) and being female new born. And it is better to give more emphasis on focused antenatal care to ensure the risk of low birth weight is detected early and treated appropriately. Health care providers should undertake prevention strategies for preterm delivery.

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