

# THE INTERNATIONAL JOURNAL OF SCIENCE & TECHNOLEDGE

## Prevalence of Low Birth Weight and Effect of Some Maternal Characteristics on Neonatal Birth Weight in Rural and Urban Areas of Ebonyi State, Nigeria

**Njoku Ha**

Lecturer, Department of Food Science and Technology, Ebonyi State University, Nigeria

**Ene-Obong Hn**

Lecturer, Department of Biochemistry (Nutrition Unit), University of Calabar, Nigeria

**Onu Tc**

Lecturer, Department of Home Economics, Enugu State College of Education (Technical), Nigeria

**Egbuna Hi**

Lecturer, Department of Nutrition and Dietetics, Anambra State Polytechnic, Nigeria

**David Ei**

Lecturer, Department of Home Economics, Ebonyi State University, Nigeria

**Ogoh Nv**

Lecturer, Department of Biochemistry, Ebonyi State University, Nigeria

**Mgbebu Po**

Lecturer, Department of Food Science and Technology, Ebonyi State University, Nigeria

**Ejeagbasi Cn**

Lecturer, Department of Home Economics, Enugu State College of Education (Technical), Nigeria

### **Abstract:**

*Low birth weight (LBW) is a major determinant of infant and young child mortality, morbidity and disability. The objective of this study was to determine the prevalence of LBW and the effect of some maternal characteristics on the birth weight of neonates in Ebonyi State. The study involved 395 singleton babies delivered in five randomly selected (5) hospitals in the state. Information on maternal hemoglobin status, family income, maternal chronological age and birth weight of neonates were collected and analyzed using appropriate statistics. The prevalence of low birth weight (LBW = < 2.5kg) was 4.8kg. There was a significant difference ( $p = 0.03$ ) in the prevalence of low birth weight between urban (8.5%) and rural (3.2%) neonates. A good number (57.0%) of the respondents were between the ages of 25 -35 years of age (46.8% for rural and 81.2% for urban). Majority (78.9%) of mothers were between 19 – 35 years had low birth weight neonates. Mothers in the middle-income group had the highest percentage (46.3%) of low birth weight babies. There was no significant relationship ( $p > 0.05$ ) between neonatal birth weight and maternal age; between neonatal birth weight and family income; and between neonatal birth weight and maternal hemoglobin status. The prevalence of LBW in this study is lower than those reported earlier for Nigeria. The implications of these findings are discussed.*

**Keywords:** Hemoglobin status, neonatal birth weight, family income, maternal nutritional status

### **1. Introduction**

The nutrition, health, age and socioeconomic status of the mother before and during pregnancy affect the baby's birth weight, how well the baby grows and baby's chances of survival (Gopalan, 1999). A healthy well-nourished sexually mature woman has a chance of having a healthy pregnancy which increases her chances of having a healthy baby. A healthy baby has a better chance of growing into a healthy adult (Gopalan, 1999).

Any successful pregnancy requires the net deposition of tissue within the mother, the placenta and the foetus. Thus, there is a fundamental relationship between the nutritional status of the mother and her ability to transfer nutrients to the foetus at the appropriate time during pregnancy. However, the mother's ability to achieve effective and timely transfer may be constrained by factors other than her immediate dietary intake or overall nutritional status. The mother may have her own demands for nutrients that compete with the needs of the foetus. In younger woman, the need to complete her own growth and development have to be satisfied (Alan, Zulfigar and Pisake, 2003).

There are other factors that could affect the nutritional status of women. Ene-Obong, (2001) found that the major determinant of the health and nutritional status of women are socio economic and cultural. In the study, it was found that more educated women had higher income, had significantly ( $P < 0.05$ ) better health and nutrition knowledge, food habit, nutrient intakes, self-concept, and less adherence to cultural practices (Ene-Obong, 2001).

Hemoglobin concentration is important during pregnancy. Poor haemoglobin concentration is especially dangerous to the mother and foetus during pregnancy. Iron deficiency is prevalent among women (McGanity, Dawson and Fogelman, 1974). The associated risks of anemia ( $Hb < 10.4g/dl$ ) to the foetus are: increased intrauterine hypoxia and intrauterine growth retardation; preterm birth, perinatal mortality and morbidity, low birth weight etc (Wardlaw and Kessel, 2002).

Low birth weights, a weight at birth, less than 2.5kg, irrespective of gestational age. Low birth weight in Nigeria was recorded as 12% (WHO, 2003, ACC/SCN, 2004). Low birth weight and preterm delivery in adolescent pregnancies is almost three times higher than for adult pregnancies. (Kontic-Vucinic, Sulovic, Radunovic, 2006).

## 2. Materials and Methods

### 2.1. Area of Study

The study was carried out in Ebonyi State, Nigeria. The state was created along with six other states on 1<sup>st</sup> October, 1996. Ebonyi state is made up of thirteen local government areas, with an estimated population of about 1, 676 million people (Ebonyi State Independent Electoral Commission, 1999). Geographically, Ebonyi state shares boundaries with Benue State to the north, Abia State to the south, Cross River state to the east and Enugu state to the west.

Ethical approval was obtained from the chairman ethical committee of Ebonyi state university teaching hospital, Abakaliki, as well as the head of Department of Obstetrics and Gynecology, Ebonyi State University Teaching Hospital, Abakaliki. Mothers who consented were included in the study.

### 2.2. Population of the Study

The population for this study was made up of all the pregnant mothers attending antenatal clinic in hospitals and maternity homes in Ebonyi State.

### 2.3. Sample and Sampling Techniques

Stratified sampling techniques were used to divide the state, into three senatorial zones. Simple random sampling was used to draw one urban and one rural community from each of the three strata. Three hundred and ninety-five women for the study were selected by drawing a sample frame of all mothers attending clinics in each of the hospitals and maternity homes that were used for the study.

### 2.4. Data Collection

The instrument for data collection for the cross-sectional survey was the questionnaire. It was used to collect data on age, income of respondents. Birth weight of neonates and maternal hemoglobin status was obtained from hospital records.

### 2.5. Statistical Analyses

Information from the questionnaire were coded and entered into the computer. The data were analyzed using statistical package for social sciences (SPSS) for WINDOWS (Version 15.0). Test of significance were two-tailed.  $P < 0.05$  was considered statistically significant.

## 3. Result

Birth Weight Range	Rural	Urban	Total
Low birth weight (<2.5kg)	9(3.5)	10(8.5)	19(4.8)
Normal birth weight (2.5 – 4kg)	269(96.8)	107(91.5)	376(95.2)
High birth weight (>4kg)	-	-	-
Total	278(100)	117(100)	395(100)

Table 1: Neonatal Birth Weight of Urban and Rural Respondents  
 $\chi^2 = 5.07$ ;  $Df = 1$ ;  $P = 0.03$

Table 1 shows that there was a significant ( $P < 0.05$ ;  $df = 1$ ;  $\chi^2 = 5.07$ ) difference in the birth weight of babies in different categories. Just a little percentage (4.8%) had low birth weight (<2.5kg) (3.2% rural and 8.5% urban). Most of the babies (95.2%) had normal birth weight (2.5 – 4kg) (96.8% rural and 91.5% urban). None of the babies had high birth weight (>4kg)

		Rural	Urban	Total
(a)	Age range (years)			
	<19	142(51.1)	19(16.2)	161(40.8)
	19 – 35	130(46.8)	95(81.2)	225(57.0)
	>35	6(2.2)	3(2.6)	9(2.3)
	Total	278(100)	117(100)	395(100)
(b)	Family Income			
	Low income ( $\leq$ level 6 = ₦13,000)	96(34.5)	8(6.8)	104(26.3)
	Middle income (level 7 – 12 = ₦14,000 – ₦30,000)	109(39.2)	76(65.0)	185(46.8)
	High income ( $\geq$ level 13 $>$ ₦30,000)	73(26.3)	33(28.2)	106(26.8)
	Total	278(100)	117(100)	395(100)

Table 2: Age Range and Family Income of the Respondents

$$X^2 = 41.72; Df = 2; P = 0.00$$

$$X^2 = 35.76; Df = 2; P = 0.00$$

Table 2 reveals the age and family income of rural and urban respondents. A greater number/percentage (225/57%) of the respondents fell within the age range of 19 – 35 years; 2.3% were above 35 years while 40.8% were less than 25 years. There was a significant difference in the age distribution of urban and rural respondents ( $X^2 = 41.72$ ;  $df = 2$ ;  $P = 0.00$ ); 51.1% of the rural respondents were less than 19 years; 16.2% of urban respondents were less than 19 years, 81.2% of urban women and 46.8% of rural respondents were between 19 – 35 years; 2.6% of urban women and 2.2% of rural women were above 35 years.

More (34.5%) of the rural women, than urban women (6.8%) were low income earners ( $\leq$  ₦13,000) more urban women (65%) than rural women (39.2%) were middle income earners (₦14,000 – ₦30,000); 28.2% of the urban respondents were high income earners ( $>$  ₦30,000), while 26.3% of rural respondents were also high-income earners.

Maternal age	Neonatal Birth Weight (Kg)		
	<2.5	2.5 – 4	Total
Adolescents (<19)	4(21.1)	85(22.6)	89(22.5)
Middle Age (19 – 35)	15(78.9)	286(76.1)	301(76.2)
Older Women (>35)	-	5(1.3)	5(1.3)
Total	19(100)	376(100)	395(100)

Table 3: Effect of Maternal Age on Birth Weight of Neonates

$$X^2 = 0.29; Df = 2; P = 0.86$$

Table 3 shows the birth weight of babies in relation to mothers' age. There was no significant ( $P > 0.05$ ) relationship between maternal age and neonatal birth weight. Among mothers below 19 years, 22.6% had normal weight babies, while 21.1% had low weight babies. Out of the 76.2% of mothers of age 19 – 35 years 78.9% had low weight babies, while 76.1% had normal weight babies. All the mothers that were above 35 years gave birth to normal weight babies.

Family Income	Neonatal Birth Weight (Kg/month)			
	<2.5	2.5 – 4	>4	Total
Low income ( $\leq$ level 6 = ₦13,000)	5(26.3)	99(26.3)	-	104(26.3)
Middle income (level 7 – 12 = ₦14,000 – ₦30,000)	11(57.9)	174(46.3)	-	185(46.8)
High income ( $\geq$ level 13 = ₦30,000)	3(15.8)	103(27.4)	-	106(26.8)
Total	19(100)	376(100)	-	395(100)

Table 4: Effect of Income on Neonatal Birth Weight

$$X^2 = 1.43; Df = 2; P = 0.49$$

Table 4 shows the monthly family income of respondents and its effect on neonatal birth weight. More (27.4%) normal weight babies (2.5 – 4kg) were found among respondents who had high income. Twenty-six-point three percent (26.3%), 57.9% and 15.8% of respondents who earned low, middle and high income respectively gave birth to low weight babies; 26.3%, 46.3% and 27.4% of mothers with low, middle and high income respectively, had normal weight babies; none of the respondents had high weight baby. There were no significant ( $P > 0.05$ ) relationship between maternal family income and neonatal birth weight.

Maternal Hb status	Neonatal Birth Weight (Kg/month)		
	<2.5	2.5 – 4	Total
Poor (<10.5g/dl)	3(15.8)	52(13.8)	55(13.9)
Normal (10.5g/dl and above)	16(84.2)	324(86.2)	340(86.1)
Total	19(100)	376(100)	395(100)

Table 5: Effect of Maternal Haemoglobin (Hb) Status on Birth Weight of Neonates  
 $\chi^2 = 0.06$ ;  $Df = 1$ ;  $P = 0.51$

Table 5 shows the effect of maternal haemoglobin status on birth weight of neonate. There were no significant ( $P > 0.05$ ) relationship between maternal haemoglobin status and neonatal birth weight; 86.2% of mothers with normal haemoglobin status gave birth to normal weight babies, while 13.8% of mothers with poor haemoglobin status gave birth to normal weight babies, as against 15.8% of mothers with poor haemoglobin status who gave birth to low birth weight babies.

#### 4. Discussion

This study tried to ascertain the relationship between maternal income, age, and haemoglobin status on neonatal birth weight. The analysis carried out revealed a prevalence of 4.8% low birth weight (LBW). This is contrary to findings of other researchers and to the national average of 12% (WHO, 2003; ACC/SCN, 2004). The low percentage of low weight babies has positive implications on the health status of children and adults in the future. It shows an improvement on the socioeconomic status of the study area.

Mothers within the age range of 19 – 35 years had the highest number of births (76.2%) in this study. This finding is also similar to those of other researchers who carried out studies in this area (Olowonjo, Oshin and Obasanjo-Bello, 2006; Wright, 1990). They reported that most births occur between the ages of 20 – 29 years and 18 – 22 years respectively.

This study found that there were no significant differences between maternal age and neonatal age. This is contrary to the findings of other researchers, for instance, Hosain, Chaterjee, Begum and Saha, 2005 observed that there was significant relationship between maternal age and neonatal birth weight.

Mothers within the age range of 19 – 35 years had the highest percentage (76.1%) of normal weight babies. This finding is in line with those of Chukwudi, Ejike, Adimora and Ibe, 2002; Oluwonyo, Oshin and Obasanjo-Bello, 2006, who found out that low birth weight was most common among teenage mothers, while normal birth weight is often found among mothers between ages 20 years and above.

According to the findings of this study, there were no significant relationship between respondent's family income and neonatal birth weight, however, respondents with highest percentage (27.4% and 46.3%) of normal weight babies (2.5 – 4kg) were found among mothers with middle and high income respectively. This finding is in line with those of others. Ene-Oboing, 2001 stated that apart from nutrition, other factor that can affect maternal well-being and pregnancy outcome include socioeconomic and cultural factors. Low birth weight is one of the clear indicators of socioeconomic status. It is also a risk factor for preterm delivery. High family income would enable mothers to feed well and be in good nutritional standing during pregnancy.

Since a good number (86.2%) of respondents with normal Hb status had normal weight babies, this is an indication that the respondents must have been adhering strictly to intake of supplements administered to them during antenatal clinics. McGanity, Dawson and Fogelman (1994) stated that haemoglobin concentration is important during pregnancy and that poor haemoglobin concentration is especially dangerous for the mother and foetus during pregnancy. He also confirmed that iron deficiency is prevalent among women.

#### 5. Conclusion and Recommendation

The percentage low birth weight (4.8%) found in this study is low and have positive implications for children of today and adults of tomorrow. However, this could further be reduced for healthier adults of tomorrow. This could be achieved by improving mothers' nutrition knowledge, embarking on result demonstrations during antenatal clinics. Women's economic status should further be improved. Girl child education and marriage at normal (right) age should be encouraged. Women's economic status should be improved by all available means.

#### 6. References

- i. ACC/SCN (2004). Low Birth Weight. 5<sup>th</sup> report on the world nutrition situation. Nutrition for improved development outcomes. Geneva: Standing Committee on Nutrition.
- ii. Alan, A.J. Zulfiqar, A.B. and Pisake, L. (2003). Nutrition as a Preventive Strategy against adverse pregnancy outcome. American Nutritional Sciences. J. Nutr. 133:15893 – 15915
- iii. Chukwudi N.K., Ejike, O. Adimora, G.N. and Ibe B.C. (2002). Influence of biosocial factors on the incidence of low birth weight babies in Enugu. Nig. J. paed. 29:99 – 102.
- iv. Ene-Obong, H.N. (2001). Eating Right: a nutrition guide: Calabar. The University of Calabar Press.
- v. Gopalan, C. (2003). Changing nutrition Sciences in South Africa. NFI Bulletin 2003; 24(2): 1 – 8.

- vi. Hosain, G.M.M., Chatterjee, N., Begum, A and Saha, S.C. (2005). Factors associated with low birth weight in rural Bangladesh. *J. Trop. Paed.* 52:87 – 91.
- vii. Kuntic-Vucinic, O; Sulovic, N; and Radunovic; N. (2006). Micronutrients in women's reproductive health. *International Journal of Fertility and Women's medicine.* Vol 51:no3, PP 106 – 115.
- viii. McGanity, M.J., Dawson, E.B., and Fogelman, A. (1994). Nutrition in Pregnancy and Lactation. In: Shills, M.E., Olson, J.A., and Shike, M. (eds). *Modern Nutrition in Health and Disease:* 705 – 727.
- ix. Oluwonjo, T; Oshun; s. and Obasanjo-Bello. I. (2006). Some factors associated with low birth weight in Ogun State, Nigeria. *Nig. Med. Pract.* 49:154 – 156.
- x. WHO/UNICEF (2003). *Low birth weight: Country, regional and global estimates.* UNICEF, New York: Nyhqdoc. Permit @unicef.org.permission@Who.Int.
- xi. Wright E.A. (1990): Low birth weight in Plateau region of Nigeria. *East Afr. Med J.* 67:894 – 899.