

# MATERNAL RISK FACTORS ASSOCIATED WITH LOW BIRTH WEIGHT AMONG CHILD BEARING MOTHERS IN ANAMBRA STATE.

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## **Abstract**

*The purpose of this study was to ascertain the maternal risk factors associated with low birth weight among child bearing mothers in Anambra state. The population of the study comprised postnatal mothers who delivered low birth weight babies. To guide the study, three research questions and three hypotheses were raised. Ex-post-facto survey research design was adopted for the study. The study also used purposive sampling and the setting was in three (3) selected general hospitals from three senatorial zones and one teaching hospital all in Anambra state. A standardized structured data sheet provided by the hospital were used for data collection. Descriptive statistics (percentage) were used to answer research questions and inferential statistics (chi square) were used to test the hypotheses at 0.05 level of significance. Findings of the study showed that non-utilization of antenatal care service during pregnancy, maternal age and maternal morbidity were factors associated with low birth weight among child bearing mothers in Anambra state. It was recommended among others that, child bearing mothers should seek for antenatal care service during pregnancy not less than six visits. Also ladies must not marry at a very low age and lastly, child bearing mothers should improve in their feeding style.*

**Keywords:** Maternal, Risk Factors, Birth weight

## **Introduction**

A healthy start in life begins from the utero and making sure that mother goes through pregnancy and child birth safely. One of the poor outcomes that has caught the attention of World Health Organization (WHO) is low birth weight (LBW). LBW as defined by WHO is the weight at birth less than 2,500g (2.5kg or 5.5 pounds). UNICEF (2014) stated in a practical cut off for international epidemiological observations that infants weighing less than 2500g are approximately twenty (20) times more likely to die than heavier

babies. LBW babies are at risk of dying in the first year of life in addition to adverse consequences such as increased neonatal morbidity and mortality inhibition of growth and cognitive development later in life Dilaram, Jitadra and kwan (2018).

LBW has been reported to be associated with negative effect on long term cognitive and motor development and on decision making (UNICEF, 2013). Invariable, LBW is an important indicator in public health because it can help to predict health outcomes later in life. Nigeria loses about 2,300 under five years old babies which may be associated with the incidence of low birth weight in the country thus making the country the second largest contributors to under five mortality in the whole world (UNICEF,2010) high risk of pregnancy factors may be grouped into two namely; **Maternal factors and fetal factors.**

Maternal factors may include non-availability of antenatal care service, non-utilization of available anti-natal care services, under-aged child bearing mothers and maternal morbidity

Antenatal care which is a means of identify mothers at risk of delivering a pattern or growth retarded infant and to provide an array of available medical nutritional and educational interventions

Research has shown that mothers who are younger than 15 years of age may present the worst outcomes in relation to health of their offspring Reichamann & Pacilia (2006).the younger adverse birth out comes such as low birth weight when compared to older mothers. Hence, ladies must not marry intended to reduce the risk of low birth weight and other adverse pregnancy outcomes. According to ogunjuyigbe et al (2008), pregnant women who registered and sought antenatal care earlier had lower incidence of low birth weight babies than those who do not attend a very low age.

According to UNICEF (2014) maternal under-nutrition, malaria, anemia, and sexually transmitted infection (STI) prevents normal circulation across the placenta and cause shortage of nutrients and oxygen supply to the fetus and restricts the growth of the fetus. Anti-tetanus toxoid infections captures maternal morbidity status during pregnancy and quality of antenatal care UNICEF (2013). Anti- toxoid is a combination of immunization agent that prevents diphtheria and tetanus infections in women (pregnant). Immunizing women of child bearing age with anti- toxoid injection protects them against maternal and neonatal tetanus infections because mothers passes her immunity to her unborn child when she is immunized. It is then expected that women who get such information are likely to obtain the required care when complications arise in order to ameliorate any form of poor pregnancy outcome.

The fetal factor, one of the high- risk pregnancy factors may be associated with foetus which contributes to low birth weight. Fetal factors include preterm birth and slow intrauterine growth retardation (IUGR). Preterm (premature) is used for infants born before 37 weeks gestation. Most but not all premature infants weigh less than 2,500g. IUGR as another factor, is a condition where fetal growth is constrained. According to Hussain *et al* (2011), IUGR is usually born by relating the size of the newborn to the duration of the pregnancy using the 10<sup>th</sup> percentile of reference population. IUGR is also associated with primiparity, multiple gestation, fetal, genetic or chromosomal anomalies as well as maternal disorder such as renal disease and hypertension.

The purpose of this study is to ascertain the maternal risk factors associated with low birth weight among childbearing mothers in Anambra state.

### **Statement of Problem**

Anambra State government had contributed immensely in health services in areas of immunization, equipping of primary health facilities for maternal and child health and also establishing health insurance scheme for strengthening the health care service in the state as stated in the background. Despite all these mentioned contributions, there is still high rate in the increasing number of low birth weight babies delivered in Anambra State and such posed a public health problem in Anambra State.

Most pregnant women especially in remote areas are advised not to allow their unborn babies gain weight by not feeding adequately with fear of delivering through cesarean section. This equally triggers the high rate of low birth weight babies in Anambra State. There is urgent need to correct, sensitize and educate people especially child-bearing mothers on the dangers and causes of low birth weight. Based on this, this present work is poised to ascertain the maternal risk factors associated with low birth weight among child bearing mothers in Anambra State.

### **Research Questions**

The following research questions guided the study?

1. Is non-utilization of antenatal care service during pregnancy a maternal risk factor associated with low birth weight among child bearing mothers?
2. Is maternal age a maternal risk factor associated with low birth weight among child bearing mothers?
3. Is maternal morbidity a maternal risk factor associated with low birth weight among child bearing mother.

## **Hypotheses**

The following null-hypotheses were tested at 0.05 level of significance.

1. There will be no significance difference between the ratings of mothers who utilize antenatal care services and those who do not utilize it.
2. There will be no significant difference between the ratings of older mothers who delivered low birth weight babies and young mothers who have low birth weight offsprings.
3. There will be no significant difference between rating of mothers who are diagnosed of maternal morbidity and those who are not diagnosed of maternal morbidity.

## **Emperical Frame Work**

### **Studies on Utilization of Antenatal Care Service**

There are several existing studies that relate to the awareness of causes of LBW. Among the studies in this category include Dilaram and Jitendra (2018). The work aimed at examining the association between LBW and maternal factors and antenatal care service utilization, in rural Nepal, using data obtained for capacity building. The study used a clustered randomized controlled design and was conducted during 2015 – 2016. Logistic regression model was used to investigate maternal and antenatal care service utilization as determinants of LBW. Of the four hundred and two singleton babies, included in the study, seventy – eight (19.4%) had an LBW (means (SD), 2210.64 (212.47)) grams. From the result, it was found that Dalit Caste/ethnicity, illiteracy, manual labor, a female baby, and having more than four family members were significantly positively associated with LBW. In addition, mothers who did not visit an antenatal care (ANC) units, visited an ANC < 4 times, did not take iron and folic acid (IFA), de-worming tablets and mothers that did not consume additional food, during pregnancy, were likely to have an LBW baby than their counterpart. The relevance of Dilaram et al's study to the present work is that it identifies the advantages and impacts of routine drugs during pregnancy and this strengthens the importance of ANC utilization during pregnancy.

### **Studies on Maternal Age of Child Bearing Mothers**

The studies on association between maternal age and LBW offspring was conducted by Dianiaet al(2008). The objective of the study was to examine the association between young mother and LBW risk in a representative sample of Non-Hispanic whites, Non-Hispanic Blacks and Hispanic American women. The date for the study was obtained from 2007 –

2008 National Health Nutrition Examination Survey (NHANES). Mothers of age 14 – 19 were used as young mothers and weight less than 2.500g was considered LBW. Univariate and multivariate logistic analysis were used. The results have it that there was no statistically significant association between young mothers and LBW in Non-Hispanic whites. This study is selected as a guide study in the present research because both addresses same issue and equally the new research will at the end close the gap of antenatal and postnatal studies recommended or set as limitation by the past studies. As the methodology adopted by this study guided the present study, both used same instrument, sampling technique, research design to draw conclusion. They only differ in settings. The former was carried out in India while the present in Nigeria

### **Maternal Morbidity during Pregnancy**

The title of the study is the association of maternal chronic disease and negative birth outcomes and was done by Graham, Zhang and Schwallberg (2007). The objective was to investigate the impact of selected maternal chronic medical condition, race and age on preterm birth (PTB), low birth weight (LBW), and infant mortality among Mississippi mothers from 1999 to 2003. The design used was retrospective cohort analysis of linked birth and death certificate. The sample was collected from 1999 – 2003 Mississippi birth cohort comprising 202,931 singleton infant born to African, American and white women. Under measurement, the relationship between maternal chronic condition and the dependent variables of PTB, LWB and infant mortality were investigated using logistic regression analysis. From the findings, the researchers conclude that maternal chronic hypertension and diabetes were significantly associated with negative birth outcomes regardless of maternal race. Maternal cardiac disease was only significantly associated with PTB and LBW among African Americans (Graham *et al* 2007). This study relates to present studies in these area; one is addressing same public health issue (low birth weight), maternal relationship to LBW and also uses hospital settings and pregnant women (pre and postnatal) as their population. The only difference is that the former was carried out in Mississippi while present work is to be carried out in Nigeria (precisely Anambra State).

### **Method**

Ex-post-facto research design was adopted for this study. All postnatal mothers (who delivered) low birth weight babies from 2016-2017 were the population used. Purposive sampling was adopted to select three (3) secondary hospitals from 3 senatorial zones and one teaching hospitals, all in Anambra

state. A standardized structured data sheet provided in the hospital were used for data collection. The data collected were analyzed using descriptive statistics (percentage) to answer research questions and inferential statistics (chi square) to test the hypotheses at 0.05 level of significance.

### Result/Data analyses

**Research Question 1:** Is non-utilization of antenatal care service during pregnancy associated with low birth weight among child bearing mothers?

**Table 1: Percentage analysis of the association between non-utilization of antenatal care during pregnancy and low birth weight**

Antenatal Care Service	Under Weight ( $\leq 2.5\text{kg}$ )	Normal Weight ( $>2.5\text{kg}$ )	Total
$\geq 6$ visits	321(14.4%)	1902(85.6%)	2223(100%)
$< 6$ visits	795(54.6%)	660(45.4%)	1455(100%)
<b>Total</b>	<b>1116</b>	<b>2562</b>	<b>3678</b>

As shown in Table 1, the analysis indicates that child bearing mothers who had  $\geq 6$  visits to the antenatal care service had greater percentage (85.6%) of babies with normal birth weight and less percentage (14.4%) of babies with under-weight compared to 45.4% of normal weight births and 54.6% of underweight births by childbearing mothers who had  $< 6$  visits to the antenatal care service. This suggests that there is an association between non-utilization of antenatal care service during pregnancy and low birth weight among child bearing mothers

**Research Question 2:** Is maternal age associated with low birth weight among child bearing mothers?

**Table 2: Percentage analysis of the association between maternal age and low birth weight**

Maternal Age	Under Weight ( $\leq 2.5\text{kg}$ )	Normal Weight ( $>2.5\text{kg}$ )	Total
$\leq 19$	267(34.5%)	7(65.5%)	774(100%)
20-35	1177(60.1%)	781(39.9%)	1958(100%)
36 and above	393(40.8%)	570(59.2%)	963(100%)

<b>Total</b>	<b>1837</b>	<b>1858</b>	<b>3695</b>
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As displayed in the above Table, the analysis indicates that child bearing mothers who are  $\leq 19$  years had greater normal weight births (65.5%) and lower under-weight births (34.5%) compared to 39.9% and 60.1% for those between 20-35 years and 59.2% and 40.8% for those from 36 years and above. This suggests that there is an association between maternal age and low birth weight among child bearing mothers.

**Research Question 3:** Is maternal morbidity associated with low birth weight among child bearing mothers?

**Table 3: Percentage analysis of the association between maternal morbidity and low birth weight**

<b>Maternal morbidity</b>	<b>Under Weight (<math>\leq 2.5\text{kg}</math>)</b>	<b>Normal Weight (<math>&gt;2.5\text{kg}</math>)</b>	<b>Total</b>
Present	833(49.7%)	843(50.3%)	2223(100%)
Not present	1157(56.4%)	896(43.6%)	1455(100%)
<b>Total</b>	<b>1990</b>	<b>1739</b>	<b>3729</b>

As displayed in Table 3, the analysis indicates that child bearing mothers with presence of morbidity had greater normal weight births (50.3%) and lower under-weight births (49.7%) compared to 43.6% of normal weight births and 56.4% of under-weight births by childbearing mothers with no presence of morbidity. This is an indication that maternal morbidity is not associated with low birth weight among child bearing mothers.

**Hypothesis 1:** The percentage number of low birth weight offspring by mothers who utilize antenatal care service and those who do not did not differ significantly.

**Table 1: Chi-square analysis of the association between non-utilization of antenatal care during pregnancy and low birth weight**

Antenatal Care Service	Under Weight ( $\leq 2.5\text{kg}$ )	Normal Weight ( $>2.5\text{kg}$ )	Total	d f	$X^2$	P-value
$\geq 6$ visits	321(14.4%)	1902(85.6%)	2223(100%)	1	672.36	.000
$< 6$ visits	795(54.6%)	660(45.4%)	1455(100%)			
<b>Total</b>	<b>1116</b>	<b>2562</b>	<b>3678</b>			

As shown in Table 1, the  $X^2$  value (672.36) and the p-value (.000) indicates that there is a significant association between utilization of antenatal care service and birth weights.

**Hypothesis 2:** The percentage number of low birth weight offspring by mothers who are 14-19 years and those who are older mothers (20-25) did not differ significantly

**Table 2: Chi-square analysis of the association between maternal age and low birth weight**

Maternal Age	Under Weight ( $\leq 2.5\text{kg}$ )	Normal Weight ( $>2.5\text{kg}$ )	Total	d f	$X^2$	P-value
$\leq 19$	267(34.5%)	507(65.5%)	774(100%)			
20-35	1177(60.1%)	781(39.9%)	1958(100%)	2	186.92	.000
36 and above	393(40.8%)	570(59.2%)	963(100%)			

	1837	1858	3695			
<b>Total</b>						
The analysis displayed in Table 2 shows that the $X^2$ value (186.92) and the p-value (.000) indicates that there is a significant association between maternal age and birth weights.						
<b>Hypothesis 3:</b> The percentage number of low birth weight offspring by mothers who are diagnosed of maternal morbidity and those who are not did not differ significantly?						
<b>Table 3: Chi-square analysis of the association between maternal morbidity and low birth weight</b>						
Maternal morbidity	Under Weight ( $\leq 2.5\text{kg}$ )	Normal Weight ( $>2.5\text{kg}$ )	Total	d f	$X^2$	P-value
Present	833(49.7%)	843(50.3%)	2223(100%)	1	16.42	.000
Not present	1157(56.4%)	896(43.6%)	1455(100%)			
<b>Total</b>	<b>1990</b>	<b>1739</b>	<b>3729</b>			

The analysis in Table 3 shows the  $X^2$  value (16.42) and the p-value (.000). The obtained p-value associated with the  $X^2$  value was less than the stipulated level of significance (0.05). This is an indication that there is a significant association between maternal morbidity and birth weights.

### Discussion

The result of the analysis on the non-utilization of antenatal care service during pregnancy associated with low birth weight in table (1), indicated that child bearing mothers who had > 6 visits to the antenatal care service had greater percentage of babies with normal birth weight and less percentage of babies with underweight compared to normal birth weight and of underweight by child bearing mothers who had < 6 visit to antenatal care service in Anambra state. This is in agreement with mazurh *et al* (2014) who found that antenatal care received during pregnancy was identified as important determinant of low birth weight in India. The test of hypotheses indicated that there is a significant associated between utilization of antenatal care service and birth weight in Anambra state. This is in agreement with

koroutan *et al* (2002) whose finding revealed that adequate use of antenatal care service reduce risk of low birth weight and other adverse pregnancy outcomes.

In addition, finding from this study in table (2) indicated that child bearing mothers who are greater than 19 years had greater normal birth weight infants and low birth weight compared to those between 20-35 years and for those from 36 years and above in Anambra. This result is in agreement with Rav *et al* (2015) findings, that offspring's born low birth weight were at an increased risk of the adult arrest , but only if they were born to adolescent (and not adult ) mothers. The test of hypotheses indicated that there is a significant associated between maternal age and birth weight in Anambra state. This disagrees with Diania*et al* (2008) who have it that there is no significant association between young mothers and low birth weight in non-Hispanic whites. The disparity may be due to racial factor.

Moreover, the result analysis on the maternal morbidity associated with low birth weight among child bearing mothers in table (3) indicates that child bearing mothers with presence of diseases (morbidity) had greater normal birth weight and lower birth weight compared to normal weight birth and of underweight birth by child bearing mothers without diseases. This finding did not agree with Graham *et al* (2007) whose finding indicated that among white mothers, maternal chronic hypertension was significantly associated with preterm birth (PTB) and low birth weight. Disparity may be different geographical area and race. The test of hypotheses shows that there is a significant associated between maternal morbidity and low birth weight in Anambra state. This is in agreement with koroutan *et al* (2002) whose finding shows that maternal infection which reflects maternal morbidity status significantly influence low birth weight offspring.

## Conclusion

Based on the findings of this study, the following conclusions were made. Non-utilization of antenatal care service and older age have greater effect on the increase of LBW offspring among child bearing mothers in Anambra state. It was also concluded that mothers diagnosed with diseases (morbidity) have less low number of LBW than mothers who were disease free in Anambra state.

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## **Instrument For Data Collection**

This table was structured to obtain data’s of low birth weight infants from 2016 to 2017 in four hospitals.

