FACTORS ASSOCIATED WITH LOW BIRTH WEIGHT IN NIGERIA.

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CERTIFICATION

This is to certify that **OJO TEMITOPE OLUWABUSAYO** of the Department of Demography and Social Statistics, Faculty of Social Sciences, carried out a Research on the topic **"FACTORS ASSOCIATED WITH LOW BIRTH WEIGHT IN NIGERIA"** in partial fulfillment of the award of the requirements for the award of Bachelor of Science (B.Sc) in Federal University Oye-Ekiti, Nigeria under my Supervision

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DEDICATION

The project is dedicated to the glory of God Almighty in which all the power, honor and majesty be given unto him on his throne for granting me great privilege to start and finish this project, And to my parent Mr and Mrs ojo and my two siblings(OJO OLUWAFEMI BODUNDE & OJO OLUWATOYIN NIFESIMI)for their full support.

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Abstract

Low birth weight (LBW) is one of the major problems in the developing world, including Nigeria. Data from the 2013 Demographic and Health Surveys was used to examine women's socio-demographic characteristics and low birth weight in Nigeria. Women aged 15-49 years, were the study population and the samples size was 2,390. Univariate analysis was carried out using tables of frequency distribution to describe the background characteristics of the respondents and bivariate analysis was done using the Chi-square ($\chi 2$) test to establish level of significance and degree of association between low birth and socio-demographic characteristics that are categorical variables in the datasets. There was significant association between socio-economic characteristics and low birth weight (LBW) ($P<0.05$). Also, there was strong significant association between region of women and low birth weight ($\chi 2 = 219.71$, $P = 0.0000$). There was also strong significant association between women level of education and low birth weight ($\chi 2 = 25.82$, $P = 0.0010$).There was also strong significant association between ethnicity and low birth weight ($\chi 2 = 74.18$, $P = 0.0000$).Binary logistic regression model was used for the multivariate analysis. From the binary logistic regression: the unadjusted relationship between socio-demographic characteristics: age (OR=0.16, P<0.05, CI=0.03-0.83) and region (OR=5.66, P<0.05, CI=3.13-10.26) (OR=0.34, P<0.05, CI=0.17-0.68) and low birth weight was statistically significant. From the adjusted result, relationship between and child malnutrition was not statistically significant. The adjusted socio-demographic characteristics with maternal: age (OR=0.17, P<0.05, CI=0.03-0.92), region (OR=4.91, P<0.05, CI2.71-8.89) (0.32, P<0.05, CI=0.15-0.64) and child spacing (OR=1.95, P<0.05, CI=1.13-3.33) and low birth weight was statistically significant. This study concluded that factors such as age of women, region, and child spacing influence low birth weight where p-value is less than five percent level of significant.

CHAPTER ONE

INTRODUCTION

1.0 BACKGROUND TO THE STUDY

Globally low birth weight is a major public health problem worldwide especially in the developing countries. According to the estimates of WHO about 25 million low birth weight babies are born each year and 5 million of them die globally (Suryakantha, 2017). An estimated 13 million babies are born before 37 completed weeks of gestation. This figure is high among middle and low income countries (Bililign, Legesse and Akibu, 2018).

The level of Low Birth Weight (LBW) in developing countries (16.5%) is more than double the level in developed regions (7%). There is a significant variation in the incidence of LBW across the regions. Low birth weight (LBW) is one of the major problems in the developing world, including Nigeria. The WHO defines LBW as birth weight less than 2,500 g irrespective of the gestational age (World Health Organization, 2011).Normal birth weight refers to weights between 2,500 grams (2.5Kg) and 4,000 grams (4.0Kg) at delivery, while overweight is any weight above 4.0Kg (Gagan, Sartaj, Kapil, Vijay, Parul ,Meenalet al et al., 2012). Low birth weight further classified as very low birth weight (VLBW) if the birth weight lies between 1000g and less than 1500g, or Extreme Low Birth Weight (ELBW) if less than 1000g.The reason for Low Birth Weight include either Preterm births or born too small for gestational age (Stoll and Kliegman, 2004). According to reports of WHO, 16 million adolescent girls gave birth each year. It was stated that babies born from these mothers accounting 11% worldwide and 95% in developing countries. The newborns of adolescent mothers are also more likely to have LBW, with the risk of long-term effects. The WHO estimates that, globally, incidence of LBW is

15.5%, which means that about 20.6 million such infants are born each year, 96.5% of them in developing countries (WHO, 2011). LBW continues to be a major public health problem worldwide, particularly in developing countries. Globally in 2013, nearly 22 million newborns (16% of all newborns) had LBW (UNICEF, 2013).

More than 20 million LBW infants are born each year in the developing world. Incidence of LBW ranged from 6% to 18% across the globe with sub-Saharan Africa accounting 13% to 15% (United Nations, 2004). It is estimated that in sub-Saharan Africa, low birth weight represents 14.3% that is almost twice of the rate of European countries. A study performed in Congo showed that rates of LBW children were 164 per 1000 live births in Kama, and 270 per 1000 in Kipaka (Namiiro, Mugalu, McAdams, Ndeezi, 2012). In Jimma, southwestern of Ethiopia, it was found a prevalence of 22.5% LBW around 145 newborn infants. In Zimbabwe, a study found a prevalence of 12.9% of LBW children (Tema, 2006).In Nigeria, LBW accounts for about 14% of the 5.3 million annual deliveries and is a principal contributor to neonatal morbidity and mortality in developing countries (Uthman, 2008). Furthermore, low birth weight affects about 5-6 million children every year. The incidence was 12.1% in Jos, 11.4% in Ogun, and 16.9% in Maiduguri (Takai, Bukar and Audu, 2014).

The following factors, operating through these genetic and "environmental" channels, have been shown to be related to the birth weight: the sex of child - for the same gestational age sboys tend to be heavier than girls (Kramer 1987). Also the maternal age – infants born to adolescents and women above 35 years tend to be smaller (Sharma et al. 2008); maternal birth weight (Simon et al., 2006); maternal weight (Rice and Thapar, 2010); maternal nutrition - cumulatively, and during pregnancy (Stephenson and Symonds, 2002); cigarette smoking (Magee, Hattis, and Kivel 2004); ethnicity (Blanc and Wardlaw, 2005); and socioeconomic

conditions operating partly through some of the factors already mentioned (Cramer 1995).The frequency of ANC visits and parity are significantly associated with birth outcomes such as birth weight. Pregnant mothers who attended less than four ANC visits double their risk of delivering LBW babies compared to those visiting four or more times. Also, studies found that the prevalence of LBW was high, up to 57% and 61.8%, among mothers who did not receive any ANC (Takai, Bukar and Audu, 2014).Therefore it is necessary to examine the effect of maternal socio-demographic characteristics on low birth weight in Nigeria.

1.1 STATEMENT OF PROBLEM

Despite this progress in terms of total child mortality, the prevalence of neonatal mortality is still on the rise (38% in 2000 and 45% in 2015), which poses significant barriers to the fulfillment of the MDGs. Globally, preterm birth (28%), severe infections (26%) and asphyxia (23%) constitute the most important causes of neonatal death (Lawn, 2010). However low birth weight (LBW) (weighing <2500 g at birth) is also considered a crucial underlying determinant and contributor to neonatal and infant mortality. LBW accounts for nearly half of all perinatal and one-third of all infant deaths. Compared with normal birthweight (NBW) babies, LBW babies are 40 times more likely to die within the first 30 days of life (Metgud, Naik and Mallapur, 2012). In African countries, LBW is claimed to be the strongest predictor of infant morbidity and mortality. Given its critical importance on child survival, LBW was adopted as one of a number of health indicators as part of the global strategy for health in the 34th Assembly of WHO in 2000 (Elshibly and Schmalisch, 2008). In particular, a child born with low birth weight is less prepared to fight infections due to its weaker immune system and is therefore more predisposed to infectious diseases such as diarrhea and respiratory infections (Ballot, chirwa and cooper, 2010).

Low birth weight has both long and short-term complications unless early screening and interventions have been made (Asmare, Berhan, Berhanu and Alebel et al, 2018). Some of the long term complications of low birth weight include hypertension, diabetic nephropathy, proteinuria, and progressive renal disease at late age, eye problems like strabismus and myopia, deafness, neurologic complications like cerebral palsy, developmental delay with IQ less than 70, epilepsy and behavioral disturbance (Hack, Klein and Taylor, 1995). Moreover, low socioeconomic status resulting in higher rates of maternal under-nutrition, anemia, illness, inadequate prenatal care and obstetric complication has a strong positive correlation with low birth weight (Bugssa, Dimtsu and Alemayehu, 2014).

This adverse pregnancy outcome may be influenced by several conditions, such as heart disease, diabetes, hypertension, behavioral disorders, impaired cognitive function, psychological disorders, and a substantial risk of complications related to the stoma includes the esophagus, stomach, duodenum, ileum, colon, pleural cavity, ureters, urinary bladder, and kidney pelvis and usually incurs long-term financial burdens for households (Nose, Sasaki, Saka, Minagawa and Okuyama, 2016). The determinants of LBW can be broadly classified as genetic, constitutional, obstetric, nutritional, related to maternal morbidities in the antenatal period, toxic exposure-related, and linked to antenatal care (ANC). Other factors including smoking, maternal age, birth spacing, ANC, anemia, genital infections, maternal ill health, and stress have also been reported (Deshpande, Phalke, Bangal, Peeyuusha and Sushen, 2011). Furthermore, with the demographic change of increased life expectancy at birth in developing countries, children born with LBW can cause an increased economic burden and an increased disease burden. Consequently, LBW is considered as a universal threat for developing countries that creates a barrier for child

development (Martinson and Reichman, 2016).This study aims at examining the effect of maternal socio-demographic factors on low birth weight in Nigeria.

1.2 RESEARCH QUESTIONS

1. What is the prevalence level of low birth weight in Nigeria?
2. Is there any relationship between maternal characteristics (number of Antenatal care visit, maternal smoking, number of birth) and low birth weight in Nigeria?
3. What other factors influence low birth weight in Nigeria?

GENERAL OBJECTIVE

1. To examine the influence of women's socio demographic characteristics on low birth weight in Nigeria.

SPECIFIC OBJECTIVES

1. To examine the level of low birth weight in Nigeria.

2. To determine the relationship between maternal characteristics and low birth weight Nigeria.

3. To investigate the pathway through which maternal socio demographic characteristics influence on low birth weight in Nigeria.

1.3 JUSTIFICATION OF STUDY

Deaths due to LBW complications are decreasing more slowly, and these are now the second leading cause of child death. (Darmstadt, Munar, and Henry, 2014).Care of the low birth weight baby possess substantial cost to the health system. There is therefore the need to focus on

finding the preventable/modifiable factors to LBW in order to reduce this cost to the health service system and eventually reduce neonatal and child mortality.

This analogy is supported by a study which said that innovation for preventive solutions is key to reducing LBW and neonatal mortality (Darmstadt, Munar, and Henry, (2014). This study aims to identify these modifiable factors. Also identifying the determinants of LBW in these facilities would add to the existing pool of knowledge, and therefore would help policy makers to develop strategies to tackle this public health concern.

1.4 OPERATIONAL DEFINITION OF TERMS

Low birth weight: This is defined as the weight of a baby measured immediately after birth and is below 2500grams.

Extremely low birth weight: This is defined as the weight of a baby measured immediately after birth and is below 1000 grams,

Very low birth weight birth weight: This is defined as the weight of a baby measured immediately after birth and its 2500grams or more but not exceeding 3400grams.

Parity: It is defined as number of deliveries after at least 28 completed weeks of gestation. This is categorized into primiparous (mothers with one delivery) and multiparous (mothers with more than one delivery).

Body mass index (BMI): This is defined as the weight measured in kilograms per height in meters squared. Normal BMI is 18.5-24.9, underweight is <18.5 and overweight/obese >25.

Gestation at delivery: This is the gestation at which the mother delivered it determines the duration of the pregnancy prior to delivery

CHAPTER TWO

LITERATURE REVIEW

2.0 INTRODUCTION

This section reviewed related materials and studies on, child health, Birth weight, low birth weight and maternal socio-demographic characteristics. The identification of factors contributing to low birth is therefore of considerable importance. Maternal socio-demographic factors, nutritional factors, toxic exposures, and antenatal care are all reported to influence the occurrence of LBW.

2.1 INCIDENCE OF LOW BIRTH WEIGHT

The children's health is the wealth of our nation is one of the World Health Organization (WHO) slogans. We will get a healthy child when the mother is healthy; health of the child is closely related to mother's health. Birth weight refers to the weight of the new born immediately after delivery by the mother. It is divided into three; low birth weight (underweight), normal birth weight and high birth weight (overweight or Macrosomia).

Low birth weight (LBW) is one of the major problems in the developing world, including Nigeria. The WHO defines LBW as birth weight less than 2,500g irrespective of the gestational age (World Health Organization, 2011).Normal birth weight refers to weights between 2,500 grams (2.5Kg) and 4,000 grams (4.0Kg) at delivery, while overweight is any weight above 4.0Kg (Gagan, Sartaj, Kapil, Vijay, Parul and Meenal, 2012) Low birth weight further classified as very low birth weight (VLBW) if the birth weight lies between 1000g and less than 1500g, or

Extreme Low Birth Weight (ELBW) if less than 1000g.The reason for Low Birth Weight include either Preterm births or born too small for gestational age (Stoll and Kliegman, 2004).

Globally an estimated 13 million babies are born before 37 completed weeks of gestation. This figure is high among middle and low income countries (Bililign, Legesse and Akibu, 2018). Low Birth Weight is a major public health problem worldwide especially in the developing countries. According to the estimates of WHO about 25 million low birth weight babies are born each year and 5 million of them die globally (Suryakantha, 2017). The level of LBW in developing countries (16.5%) is more than double the level in developed regions (7%). There is a significant variation in the incidence of LBW across the regions. According to reports of WHO, 16 million adolescent girls gave birth each year. It was stated that babies born from these mothers accounting 11% worldwide and 95% in developing countries. The newborns of adolescent mothers are also more likely to have LBW, with the risk of long-term effects. The WHO estimates that, globally, incidence of LBW is 15.5%, which means that about 20.6 million such infants are born each year, 96.5% of them in developing countries (WHO, 2011). LBW continues to be a major public health problem worldwide, particularly in developing countries. Globally in 2013, nearly 22 million newborns (16% of all newborns) had LBW (UNICEF, 2013). Prevalence of LBW varies considerably across regions and within countries. However, it was estimated that 97% of LBW occurs in low- and middle-income countries, and especially among the most vulnerable populations, including the poor in remote areas. Among regions, prevalence of LBW is highest in South Asia, at 28%, followed by Sub-Saharan Africa, 13%, Latin America and the Caribbean, 9%, and 6% in East Asia and the Pacific (UNICEF and WHO, 2004).

Regional estimates of LBW include 28% in south Asia, 13% in sub-Saharan Africa and 9% in Latin America. It is worth noting that these rates are high, in spite of the fact that the data

on LBW remain limited or unreliable, as many deliveries occur in homes or small health clinics and are not reported in official figures, which may result in an underestimation of the prevalence of LBW. Nevertheless, low birth weight is a global concern, as some high-income countries are also faced with high rates for their contexts (e.g. Spain, the United Kingdom of Great Britain and Northern Ireland and the United States of America). Currently, a high percentage of infants are not weighed at birth, especially in low-income countries, presenting a significant policy challenge (WHO, 2014).

2.2 LOW BIRTH WEIGHT IN SUB-SAHARA AFRICA

It is estimated that in sub-Saharan Africa, low birth weight represents 14.3% that is alm ost twice of the rate of European countries. A study performed in Congo showed that rates of LBW children were 164 per 1000 live births in Kama, and 270 per 1000 in Kipaka (Namiiro, Mugalu, McAdams and Ndeezi, 2012). In Jimma, southwestern of Ethiopia, it was found a prevalence of 22.5% LBW around 145 newborn infants. In Zimbabwe, a study found a prevalence of 12.9% of LBW children (Tema, 2006). Because there is a high percentage of LBW in Sub-Saharan Africa, it is important to assess the impact during the stages of growth of those children. Growth evaluation during the neonatal period is determined by the changes in anthropometric measurements and the body weight gain is a valuable guide to indicate an adequate growth. The change in the body weight during the neonatal period of LBW children is characterized by an initial loss of 8% to 15% in the first 7 days of life followed by a recovery that occurs around 10–21 postnatal day (Rugolo, 2005).

More than 20 million LBW infants are born each year in the developing world. Incidence of LBW ranged from 6% to 18% across the globe with sub-Saharan Africa accounting 13% to

15% (United Nations, 2004). LBW is an important indicator of reproductive health and general health status of population. LBW leads to an impaired growth of the infant and is associated with higher mortality rate, increased morbidity, impaired mental development and chronic adult disease (Pawar and Kumar, 2017). LBW is the result of either intrauterine growth restriction or premature birth. LBW is the main cause of fetal or neonatal morbidity and mortality. Later in life, it can be highly associated with chronic diseases and inhibited growth and development including poor academic achievement (Bililign, Legesse and Akibu, 2018). Multiple gestation, mothers' body composition during conception, maternal short stature, residing at high altitudes, maternal nutrition during pregnancy including life style (substance or drug abuse) and medical disorders during pregnancy including hypertensive disorders were risk factors of LBW babies. Additionally, mothers with low socio-economic status are prone to infections from poor nutrition, thus birth weight will decrease (WHO, 2004).

2.3 THE INCIDENCE OF LOW BIRTH WEIGHT IN NIGERIA

In Nigeria, LBW accounts for about 14% of the 5.3 million annual deliveries and is a principal contributor to neonatal morbidity and mortality in developing countries (Uthman, 2008). Furthermore, low birth weight affects about 5-6 million children every year. The incidence was 12.1% in Jos, 11.4% in Ogun, and 16.9% in Maiduguri (Takai, Bukar and Audu, 2014). A number of factors need to be investigated in order to lessen the prevalence of LBW in Nigeria.

There are numerous maternal and fetal factors contributing to the LBW incident. LBW is strongly associated with maternal factors such as younger and older age, low socio-economic status, residence in the rural area, and illiteracy (Singh, Chouhan and Sidhu, 2009). Mothers aged under 17 and over 35 years are at risk of delivering LBW babies. Mothers in deprived socio-

economic conditions frequently have LBW infants. There is ample evidence to show that maternal factors and risk behaviors during antenatal period play significant roles in the birth weight of babies. Pregnant mothers with unhealthy lifestyles that include activities such as smoking were found to be at high risk of delivering LBW babies (Assefa, Berhane and Worku, 2012).

Antenatal care (ANC) visits are important for maternal and fetus health. ANC refers to pregnancy-related healthcare services provided by skilled health personnel during pregnancy that monitor the well-being of both the mother and the unborn child. It is essential to the purposes of obtaining the best possible outcome and preventing any complications. The frequency of ANC visits and parity are significantly associated with birth outcomes such as birth weight. Pregnant mothers who attended less than four ANC visits double their risk of delivering LBW babies compared to those visiting four or more times. Also, studies found that the prevalence of LBW was high, up to 57% and 61.8%, among mothers who did not receive any ANC (Takai, Bukar and Audu, 2014). Due to the irregularity of ANC visits, pregnant mothers do not comply with the advice or medications recommended by healthcare providers and subsequently will increase the incidence of LBW. The quality of each ANC visit also should be emphasized in order to have an effective coverage of care (Agrawal, Agrawal, Chaudhary, Agarwal, and Agarwal, 2011).

The factors affecting LBW in Nigeria have not been adequately investigated. Identifying the predictors of LBW and addressing the best prevention strategies will help to avert early the childhood morbidity and mortality resulting from LBW.

2.4 ESTIMATION STRATEGY FOR LOW BIRTH WEGHT

Birth weights below 3000g are considered sub-optimal, with the lower extreme end, below 2500g (5.5lb), having the most documented adverse health outcomes. On the upper end of the birth weight distribution, birth weights over 4000g are associated with increased maternal morbidity, complicated labor, and maternal death. Outcomes at the lower end of the birth weight scale, most likely reflect intrauterine growth deprivation or conditions leading to preterm delivery, while the upper end reflects unusual fetal growth (Rice and Thapar, 2010). Thus, there is an optimum birth weight range associated with trouble-free delivery, where neonatal survival is maximized and maternal death is minimized. Undeniably, the child's genetic makeup affects the birth weight. In addition, the intrauterine environment is a critical determinant, as demonstrated for example in studies where embryos have been transferred to different mothers (Brooks et al, 1995).

2.5 SOCIO-DEMOGRAPHIC FACTORS AND LOW BIRTH WEIGHT

The following factors, operating through these genetic and "environmental" channels, have been shown to be related to the birth weight: the sex of child - for the same gestational age boys tend to be heavier than girls (Kramer 1987). Also the maternal age – infants born to adolescents and women above 35 years tend to be smaller (Sharma, Katz, Mullany, Khatry, LeClerq, Shrestha, Darmstadt, and Tielsch, 2008); maternal birth weight , maternal weight (Rice and Thapar, 2010); maternal nutrition - cumulatively, and during pregnancy (Stephenson and Symonds 2002); cigarette smoking (Magee, Hattis, and Kivel2004); ethnicity (Blanc and Wardlaw, 2005); and socioeconomic conditions operating partly through some of the factors already mentioned (Cramer 1995). To elaborate on the latter effect, it has been shown in sub-

Saharan Africa as well as other developing parts of the world, that poverty, low education, and women's lack of autonomy are related to limited or late initiation of obstetric care, irregular or incomplete immunization (e.g. against Tetanus infection), poor nutrition, and micronutrient supplementation during pregnancy (Spangler and Bloom, 2010). In addition, the length of the earlier birth intervals (those who have had many children are likely to have had them in short intervals) is important. A birth interval below two years tends to be a risk factor for a preterm or low birth weight delivery (Smith, Pell, and Dobbie 2003).

Age

Women in the reproductive age who are 35years and above are known to deliver low birth weight infants (Chiavarini, Bartolucci, Gili, Pieroni, and Minelli, 2012). LBW disparities by maternal age are a complex related with socioeconomic disadvantage and current social and behavioral factors. It's been shown that LBW risk does not operate uniformly by maternal age. (Dennis and Mollborn, 2013).

The older group may also have more medical and obstetric complications (diabetes mellitus, chronic hypertension, poor presentation, pregnancy-induced hypertension, placenta praevia, multiple pregnancies, pre-term labor, fetal distress, retained placenta, postpartum hemorrhage and endometritis), and these may lead to adverse fetal outcomes such as low birth weight, low Apgar scores and congenital anomalies (Tabcharoen, Pinjaroen, Suwanrath, and Krisanapan, 2009).Adolescents or teenage mothers (< 20 years of age) often have worse socioeconomic and reproductive conditions and perinatal outcomes when compared to other age groups such as those between 20-29 years. A study by Guimarães, d'Avila, Bettiol, Souza, Gurgel, Almeida, Ribeiro, Barbieri, 2013, showed that among mothers with no prenatal care

and who were at risk of low birth weight, adolescence was a risk factor for LBW only for mothers who did not have a partner (Guimarães,. d'Avila, Bettiol, Souza, Gurgel, Almeida, Ribeiro and Barbieri, 2013).

Educational Level

The educational level of individuals in the family has a huge influence on the social welfare of members of the family. Therefore higher levels of education have relatively larger and increasing benefits (Rolleston, 2011). Less educated mothers, are known to have low birth weight infants (Chiavarini, Bartolucci, Gili, Pieroni, andMinelli, 2012). Infants of women with low/low intermediate education have significantly higher odds of a LBW than those of a higher education (Gisselmann, 2005). A study by Silvestrin, Silva, Hirakata, Goldani, Silveira, and Goldani, 2013)to prove the hypothesis of similarity between the extreme degrees of social distribution, which is translated by maternal education level in relation to the proportion of low birth weight could not be confirmed. This indicates that the extremes of educational level have a significant influence on LBW. Educational level is a key factor to improving birth outcomes (Sebayang, Dibley, Kelly, Shankar, and Shankar, 2012).

Occupation

Some occupations have been known to have a negative effect on birth weights. Belonging to certain occupational groups during pregnancy could increase the risk of low birth weight and preterm birth. (Ronda, Hernández-Mora, García, and Regidor, 2009).

Studies by Ronda et al., 2009 showed that the highest prevalence of preterm infants was found in mothers working in agriculture (10.8%) and the lowest in professional women(6.6%). The highest prevalence of low birth weight was observed in women working in the services sector

(3.5%) and manual workers in industry and construction (3.4%). But the lowest prevalence of low birth weight was found in professional women (2.5%). Women working in agriculture had a higher risk of preterm birth/LBW than professional women (Ronda, Hernández-Mora, García, and Regidor, 2009).

Marital status

Research work on health and mortality by marital status has consistently identified that unmarried individuals generally report poorer health and have a higher mortality risk than their married counterparts (Robards, Evandrou, Falkingham, and Vlachantoni, 2012). These can contribute to a mother giving birth to a LBW baby.

Unmarried women have higher rates of low birth weight than married women. However, assumptions that unmarried women are uniformly at a disadvantage may be unfounded. A woman's relationship characteristics may be more relevant for infant health than her formal marital status (Bird, Chandra, Bennett, and Harvey, 2000).

Wealth Status

The earning capacity often determines the prevalence of low birth weight. Poverty acts to limit access to care and the choice and amount of foods available to pregnant women. Women's status may influence pregnancy weight gain through the family's response to the woman's pregnancy. It is in this context that the potential of using micronutrient supplements rather than food became attractive to many international agencies in the 1990s (UNICEF, 1999). Micronutrients supplements are cheaper and more feasible and can improve dietary quality by providing several key nutrients, such as iron, vitamin A, foliate, and zinc, at the same time. This was a controlled trial among HIV-infected but asymptomatic women. The prevalence of LBW

was only 9% in the 2 groups who received multivitamins with or without vitamin A, compared with 14.5% and 17.2% for those who received iron-foliate and vitamin A and iron-foliate only, respectively (Fawzi, Msamanga, and Spiegelman, 1998).

2.6 MATERNAL CHARACTERISTICS AND LOW BIRTH WEIGHT

Number of Antenatal Care Visit

Mothers attending ANC to avoid reprimands from health workers are factors that motivate pregnant women to attend ANC. The same study indicated that the timing of ANC initiation is influenced by concerns regarding pregnancy uncertainties, particularly during the first trimester. Low attendance could be attributed to how ANC services/workers responded to this uncertainty; age, parity and the associated implications for pregnancy disclosure; interactions with healthcare workers, particularly messages about timing of ANC; and the cost of ANC, including charges levied for ANC procedures - in spite of policies of free ANC. Also the compulsory nature of follow-up appointments discourages attendance. A study in Nepal to find the factors of LBW noted that, mothers who do not attend antenatal care, have an increased odds of having a LBW infant by more than two times (Khanal, Zhao, and Sauer, 2014).

Maternal Smoking

Smoking has been confirmed a high risk factor for low birth weight. Studies have shown that cessation of smoking by expectant mothers has significant effect on increasing birth weight in most intervention trials (Herbel, Fox and Sexton, 1988). Methods applied to bring about smoking cessation include; self-help methods, health education and counseling programmers. However, Kramer (1987) has shown that maternal smoking is not a cause of low birth weight in developing countries.

Number of Birth

Furthermore, some studies have shown that birth weights tend to be low at very low parities and then increase with parity up to a certain level, after which the marginal increases begin to dwindle and eventually give way to declines (Wilcox, 2001). The exact parity level at which birth weights begin to decline appears to be context-specific and has not been widely studied. A possible reason for this negative effect of birth order on the birth weight is that the mother's health may have been weakened as a result of many pregnancies and years of caring for children. This idea is somewhat medically supported in that it is believed that the growth of the baby during pregnancy is affected by the mother's levels of hormones and insulin-like growth factors; which tend to reduce at very high parities (D'Ercole and Ye, 2008).

To delineate the effect of parity on low birth weight, one should ideally control for stable- and changing characteristics of the mother, her household and society that are causally behind or co-determined with parity and also potentially affecting the birth weight. Some of these factors such as the child's sex, the mother's age, the length of earlier birth intervals, and whether or not the mother had prenatal services during the pregnancy are measured in the DHS surveys and are included in the models.

2.7 THEORETICAL FRAMEWORK

Theory of Planned Behaviour

Theory of planned behaviour suggests that a person's behavior is determined by his/her intention to perform the behavior and that this intention is, in turn, a function of his/her attitude toward the behavior and his/her subjective norm. The best predictor of behavior is intention. Intention is the cognitive representation of a person's readiness to perform a given behavior, and

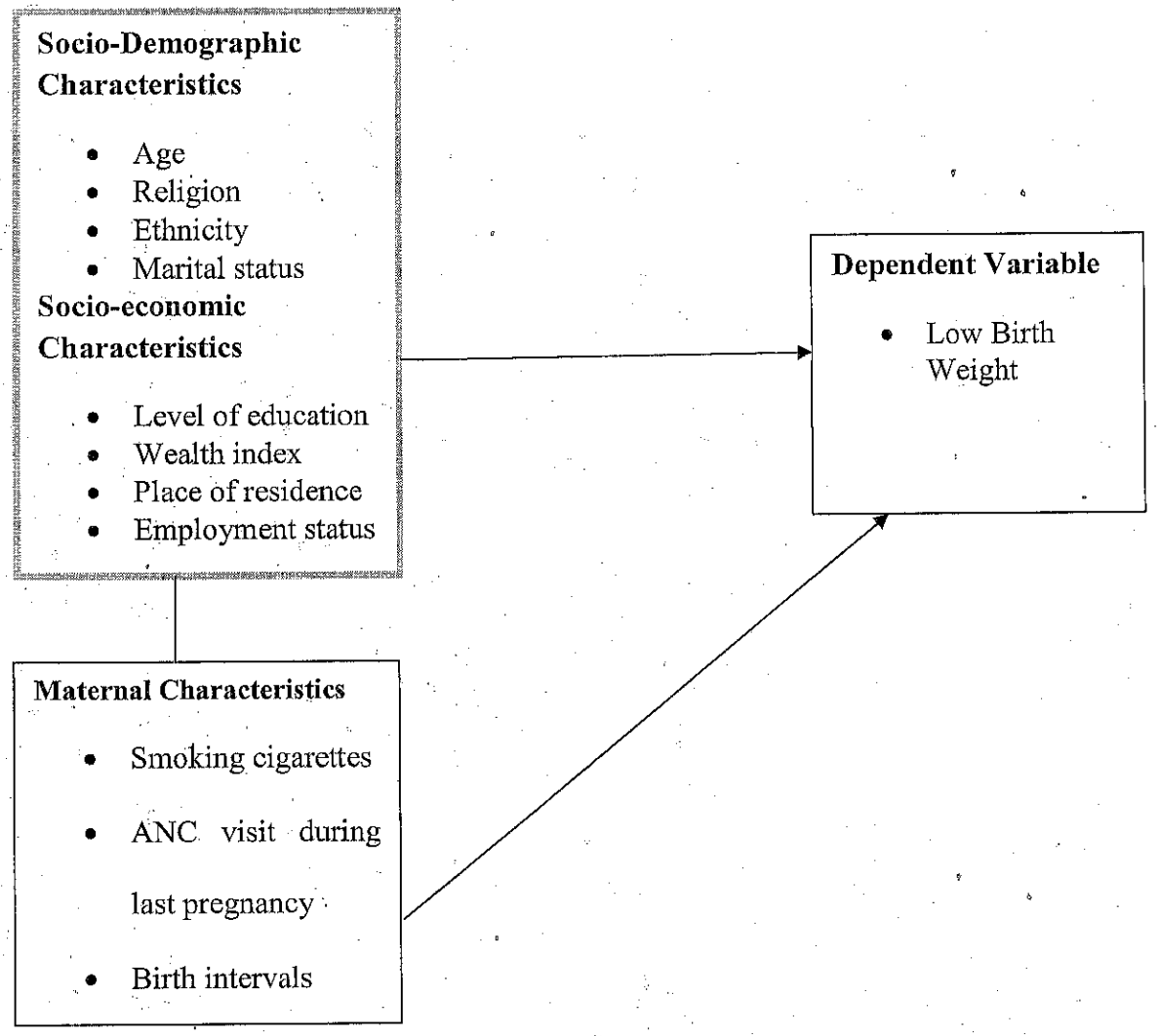
it is considered to be the immediate antecedent of behavior. This intention is determined by three things: their attitude toward the specific behavior, their subjective norms and their perceived behavioral control. The theory of planned behavior holds that only specific attitudes toward the behavior in question can be expected to predict that behavior. In addition to measuring attitudes toward the behavior, we also need to measure people's subjective norms – their beliefs about how people they care about will view the behavior in question. To predict someone's intentions, knowing these beliefs can be as important as knowing the person's attitudes. Finally, perceived behavioral control influences intentions. Perceived behavioral control refers to people's perceptions of their ability to perform a given behavior. These predictors lead to intention. A general rule, the more favorable the attitude and the subjective norm, and the greater the perceived control the stronger should the person's intention to perform the behavior in question. This would be used in examine the effect of maternal socio-demographic characteristics that had effect on the issue of low birth weight in terms of the rational behaviour in planning for the interval and timing of births.

2.8 CONCEPTUAL FRAMEWORK

The diagram below illustrates the independent variable and maternal socio-demographic variables which has effect on the dependent variable positively or negatively. Factors related to mother's characteristics include age, marital status, educational attainment, wealth status, place of resident and region. A number of studies show that mother's age (at the time of giving birth) is associated with LBW (Mahumud, Sultana, and Sarker 2017). Factors related to mother's health-related behaviors include: whether the mother smokes cigarettes, whether the mother perceived any problems in accessing health care services, number of antenatal care (ANC) visits

during pregnancy, and whether the m other received ANC with nutritional counseling. Quality of ANC is also included in some studies as a potential risk factor of LBW.

CONCEPTUAL FRAMEWORK



Source: Author's construct, 2018

2.9 STATEMENT OF HYPOTHESIS.

H_1: There is a relationship between women's socio demographic characteristics and low birth weight in Nigeria.

H_0: There is no relationship between women's socio demographic characteristics and low birth weight in Nigeria.

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 INTRODUCTION

This chapter seeks to explain the plan and approach for executing the research work. It covers the description of the study area, target population, source of data, sampling design and sample size, method of data collection, measurement of variables and method of data analysis.

3.1 DESCRIPTION OF THE STUDY AREA

Nigeria is a West African country located between latitudes 4°16' and 13°53' north and longitudes 2°40' and 14°41' east. It is extends from Gulf of Guinea in the south to the fringes of the Sahara Desert in the north. The country is bordered by Niger Republic and Chad in the north, Cameroon on the east, and the Republic of Benin on the west. With a population of 140,431,790 (NPC, 2006), Nigeria is the most populous country in Africa and the 14th largest in land mass (World Bank, 2012). Nigeria has great geographical diversity, with its topography characterized by two main land forms: lowlands and highlands. The uplands stretch from 600 to 1,300 meters in the North Central and the east highlands, with lowlands of less than 20 meters in the coastal areas. The lowlands extend from the Sokoto plains to the Borno plains in the North, the coastal lowlands of western Nigeria, and the Cross River basin in the east. The highland areas include the Jos Plateau and the Adamawa Highlands in the north, extending to the Obudu Plateau and the Oban Hills in the southeast. Other topographic features include the Niger-Benue Trough and the Chad Basin.

Nigeria has a tropical climate with wet and dry seasons. Its climate is influenced by the rain-bearing southwesterly winds and the cold, dry, and dusty northeasterly winds, commonly referred to as the Harmattan. The dry season occurs from October to March with a spell of cool, dry, and dusty Harmattan wind felt mostly in the north in December and January. The wet season occurs from April to September. Nigeria marked its centenary in 2014, having begun its existence as a nation-state in 1914 through the amalgamation of the northern and southern protectorates. Before this time, there were various cultural, ethnic, and linguistic groups, such as the Oyo, Benin, Nupe, Jukun, Kanem-Bornu, and Hausa-Fulani empires. These groups lived in kingdoms and emirates with sophisticated systems of government. There were also other strong ethnic groups such as the Igbos, Ibibios, Ijaws, and Tivs. The establishment and expansion of British influence in both northern and southern Nigeria and the imposition of British rule resulted in the amalgamation of the protectorates of southern and northern Nigeria in 1914.

Current, local data are crucial to inform priorities and drive scale-up. This national level profile provides the most current national-level information on the status of prevention and care for preterm birth and low birth weight in Nigeria. Data presented highlight a number of risk factors relevant to preterm and low birth weight in Nigeria as well as the coverage of important care for women and newborns from pregnancy, labor and delivery and the postnatal period. There is also information that provides insights into the health workforce, health policies, health information and community mobilization relevant to preterm birth and low birth weight. The information provided here can be used to understand the current situation, increase attention to preterm births in Nigeria and to inform dialogue and action among stakeholders. Data can be used to identify the most important risk factors to target and gaps in care in order to identify and implement solutions for improved outcomes.

3.2 TARGET POPULATION

The category of eligible respondents in this study focus currently on women aged 15-49 years, which was collected by the Nigeria Demographic Health Survey (NDHS) 2013.

3.3 QUANTITATIVE DATA SOURCE

This study analyses data from women recode of Nigeria Demographic and Heath Survey (NDHS) 2013 dataset.

3.4 SAMPLE DESIGN FOR THE 2013 NDHS

The sample for the 2013 NDHS was nationally representative and covered the entire population residing in non-institutional dwelling units in the country. The survey used as a sampling frame the list of enumeration areas (EAs) prepared for the 2006 Population Census of the Federal Republic of Nigeria, provided by the National Population Commission. The sample was designed to provide population and health indicator estimates at the national, zonal, and state levels. The sample design allowed for specific indicators to be calculated for each of the six zones, 36 states, and the Federal Capital Territory, Abuja. The 2013 NDHS sample was selected using a stratified three-stage cluster design consisting of 904 clusters, 372 in urban areas and 532 in rural areas. A representative sample of 30,327 households was selected for the survey, with a minimum target of 943 completed interviews per state. A fixed sample take of 45 households were selected per cluster.

All women who were either permanent residents of the households in the 2013 NDHS sample or visitors present in the households on the night before the survey were eligible to be interviewed. In a subsample of half of the households, all women age 15-49 who has a child that

is within the age range of 0-59 months that were either permanent residents of the households in the sample or visitors present in the households on the night before the survey were eligible to be interviewed (Nation Population NPC&ICF International Commission, 2014).

3.5 SAMPLE SIZE

All women age 15-49 who were either permanent residents of the households in the 2013 NDHS sample or visitors present in the households on the night before the survey were eligible to be interviewed. The sample size of women age 15-49 years that were used are 2,390.

3.6 DEPENDENT VARIABLE: LOW BIRTH WEIGHT

The dependent variable, low birth weight will be coded as children whose weight at birth is below 2,500 grams (2.5Kg) from the reference population median. The variable low birth weight will be recode into 2500/9000=0 "No" and 700/2460=1 "Yes" (Nation Population NPC & ICF International Commission, 2014), which will generate low birth weight.

The growth standards were generated through data collected in WHO Multicentre Growth Reference Study (WHO, 2011). Low birth weight (LBW) is one of the major problems in the developing world, including Nigeria. The WHO defines LBW as birth weight less than 2,500 g irrespective of the gestational age (World Health Organization, 2011).

3.7 INDEPENDENT VARIABLES

The independent variables considered are the direct proxies for maternal socio demographic characteristics. The variable is measured two broad categories the socio-demographic characteristics and the maternal characteristics.

3.8 MATERNAL CHARACTERISTICS

Maternal Health Related Behaviors

Smoking cigarettes: This reveal the number of women that take cigarettes. The responses are classified into two. If the respondents say No, it was coded as '0', if yes it was coded as '1'.

Problem in accessing care: This shows proportion of women that had problem in getting medical help for themselves, which involves in getting permission to go, getting money needed for treatment, distance to health facility, not wanting to go alone and attitude of the health workers. The responses are classified into two. If the respondents say Not a big problem, it was coded as '0', if yes it is a big problem was coded as '1'.

Antenatal care visit during last pregnancy: This shows the proportion of women that go for antenatal care during pregnancy. The responses are classified into two. If the respondents say No, it was coded as '0', if yes it was coded as '1'.

Baby's Characteristics

Birth interval: The shows the interval between the first birth and the next. The responses are classified into seven. If the respondents say <12 months, 1year, 2years, 3years, 4years, 5years and lastly is 6years and above. Sex will be classified as male '1' and female '2'.

3.9 DATA MANAGEMENT AND VARIABLE MEASUREMENT

The table below shows the various level of data manipulation and measurement of selected variables for the purpose of analysis.

NAME OF VARIABLE	VARIABLE MEASUREMENT AND CODES	DATA RECORDED AND MANIPULATION
Dependent Variable: • Low Birth Weight	M19_1	= ≥ 2.5Kg = < 2.5Kg
INDEPENDENT VARIABLE: **Socio economic factors:** • Level of education	v106(Categorical) No education, primary, secondary, Higher.	The same categories
• Wealth index	v190(categorical) Poorest, Poorer, Middle, richer, richest.	Poor Middle Rich
• Place of residence	v025(Categorical) Urban Rural	The same categories

• Employment status	v705 (categorical) not working, sales, professional/technical/managerial, agricultural, household and domestic service, manual, clerical (working)	
Demographic factors: • Religion	v130(Categorical) Catholic, Other Christian, Islam, Tradition, Others	Three main ethnic group: Yoruba, Hausa, Igbo and other Minority ethnic groups
• Ethnicity	v131(categorical) Fulani, Hausa, Ibibio, Igala, Igbo, Ijaw/izon, Kanuri/beriberi, tiv, Yoruba, Others.	Three main ethnic group: Yoruba, Hausa, Igbo and other Minority ethnic groups
• Marital status	v501(categorical) never in union, married, separated, divorced, widowed, living with partner.	Single,married,widowed, divorced/separated

Maternal Characteristics: • Availability of health care services	m57f_1 (categorical) Government health care services	 No Yes
• Child spacing	V604 (categorical)	<12 months 1 year 2 years 3 years 4 years 5 years 6+ years
• Smokes Cigarettes	V463a (categorical) Yes, No	The same categories

3.10 DATA PROCESSING AND ANALYSIS

The NDHS datasets from 2013 women recode will be processed and analyzed using Stata application package (STATA 13.0). The data processing will be necessary before the proper analysis in order to measure the variables in this study accurately as well as to make the analysis well presentable and easily interpretable. The tools for data manipulation were employed on the STATA application package to achieve this task. To ensure reliable data, sample weights and STATA survey command (SVY) were applied to adjust for stratified sample design and the effect of over-sampling or under-sampling of some regions or areas.

The general binary logistic regression model used for the multivariate analysis is:

$$\log\left(\frac{p}{1-p}\right) = \beta_o + \beta_1 x_1 + \beta_2 x_2 + \ldots \beta_n x_n$$

Where p = probability of exposure to low birth weight

X_1-xn = predictor variables

βo, β1 - βn = regression coefficients

Univariate analysis was carried out using tables of frequency distribution to describe the background characteristics of the respondents and the bivariate analysis was carried out using the Pearson Chi-square (χ^2) test to show the association between low birth weight and women socio-demographic characteristics that are categorical variables in the datasets. Furthermore, binary logistic regression was used in the multivariate analysis to identify the strength of association and examine the influence of women socio-demographic characteristics on low birth weight among women in Nigeria.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND INTERPRETATION.

4.0 INTRODUCTION

This chapter deals with presentation, analysis and interpretation of the data collected from secondary sources Nigeria Demographic and Health Survey (NDHS, 2013) to show the socio-demographic influence of low birth weight among reproductive women in Nigeria. For the purpose of analysis, this study makes use of descriptive analysis and inferential analysis.

The descriptive analysis describes the relevant aspects of the phenomena under consideration and provide detailed information about these variables such as; socio-demographic characteristics and low birth weight. However, in supportive of descriptive statistics, inferential analysis, pearson Chi-square test was used to ascertain relationship while logistic regression analysis was used in testing the study hypothesis.

4.1 Distribution of Respondents by Socio-Demographic Characteristics by Weighted Percentage.

Results in Table 4.1 below showed women age 25-29 years by 36.8%, 30-34 years by 27.1%, 20-24 years by 17.7%, 35-39 years by 12.9%, age 15-19 years by 2.5%, the least were age 40-44years and 45-49 years by 2.4% and 0.7% respectively. Women reported to be from urban area by 73.8% and rural area by 26.2%. They had secondary education by 55.2%, higher education by 27.5%, primary by 11.8% and the least were those with no formal education by 5.5%. Igbo women dominate the study area by 30.4%, Yoruba by 28.9% and the least were Hausa by 9%. Also, women reported from southern region were by 70.4% and northern region by 29.6%. Christian women reported by 73.2%, Muslim women by 26.5% and traditional women

by 0.3%. The rich women reported by 83.6%, middle wealth status by 10.9% and the poor women reported by 5.5%. It was reported that women were employed by 77.7% and not employed by 22.3%. Women reported to be married were 96.8%, single by 1.9%, divorced and separated were 0.7% respectively. It was reported that women had no low birth weight by 90.8% and had low birth weight by 9.2%. Women attend antenatal care visit by 21.7% and no antenatal care visit by 78.3%. Women that space their children by less than 12 months were 27.7%, 2 years were 26.9%, 3 years by 21.3%, 1 years by 11.5%, 4 years by 7.2%, 5years and 6years above were 4.3% and 1.1%. Women that smoke cigarettes were 0.3% and those that did not smokes by 99.7%.

Table 4.1: Distribution of Respondents by Socio-Demographic Characteristics by Weighted Percentage.

Background Characteristics	Frequency	Percent (%)
LOW BIRTH WEIGHT		
No	2170	90.8
Yes	220	2.2
Age		
15-19	59	2.5
20-24	423	17.7
25-29	880	36.8
30-34	647	27.1
35-39	309	12.9
40-44	57	2.4
45-49	15	0.7
Place of residence		
Urban	1,763	73.8
Rural	627	26.2
Highest educational level		
No formal education	131	5.5
Primary	282	11.8
Secondary	1,320	55.2
Higher	657	27.5

Ethnicity		
Yoruba	691	28.9
Hausa	215	9.0
Igbo	728	30.4
Others	756	31.6
Region		
North-Central	240	10.0
North-East	147	6.2
North-West	319	13.4
South-East	541	22.6
South-South	355	14.9
South-West	787	32.9
Religion		
Christianity	1,740	73.2
Islam	629	26.5
Traditional	7	0.3
Wealth status		
Poor	130	5.5
Middle	262	10.9
Rich	1,997	83.6
Occupation		
Not employed	532	22.3
Employed	1,849	77.7
Marital status		
Single	45	1.9
Married	2,312	96.8
Widowed	17	0.7
Separated	16	0.7
Antenatal care visit:		
No	1,854	78.3
Yes	515	21.7
Child spacing		
Less than 12 months	662	27.7
1 year	276	11.5
2 years	643	26.9
3 years	509	21.3
4 years	173	7.2
5 years	102	4.3
6+ years	26	1.1
Smokes cigarettes		
No	2,383	99.7
Yes	7	0.3

Total	**2,390**	100.0

4.2.: Distribution of Respondents by Socio-Demographic Characteristics and Low Birth Weight.

There is significant association between socio-demographic characteristics and low birth weight ($P<0.05$). There is significant association between highest level of education and low birth weight (X^2 =25.82, P =0.0010) whereby women with secondary education had low birth weight with 50.5%, higher education by 22.4%, primary education by 14.7% and no formal education by 12.5% compare to those that did not had low birth weight. There is strong significant association between ethnicity and low birth weight (X^2 =74.18, P == 0.0000) whereby hausa women had low birth weight by 18.3%, igbo by 17.8% and Yoruba by 14.6% compare to those that did not had low birth weight. There is strong significant association between region and low birth weight (X^2 =219.71, P =0.0000) whereby north-west by 44.4%, south-south by 15.6%, south-west by 11%, south-east by 10.9%, north-central by 9.4% and north-east by 8.7% compare to those that did not had low birth weight. There is significant association between wealth status and low birth weight (X^2== 23.44, P =0.0017) whereby the rich had low birth weight by 76.6%, poor women by 12.6%, middle wealth status by 10.7% compare to those that did not had low birth weight.

Table 4.2.: Distribution of Respondents by Socio-Demographic Characteristics and Low Birth Weight.

Background Characteristics	Low Birth Weight		Statistics
	No	Yes	
Age			
15-19	2.2	5.1	
20-24	17.3	21.5	
25-29	37.3	31.9	$\chi2$ =**14.17**
30-34	26.9	28.9	**Pr=0.1243**
35-39	13.1	10.8	
40-44	2.5	0.8	
45-49	0.6	0.9	
Place of residence			
Urban	73.9	72.5	$\chi2$=**0.20**
Rural	26.1	27.5	**Pr=0.7226**
Highest educational level			
No formal education	4.8	12.5	
Primary	11.5	14.7	$\chi2$=**25.82**
Secondary	55.7	50.5	**Pr= 0.0010**
Higher	28.0	22.4	
Ethnicity			
Yoruba	30.4	14.6	
Hausa	8.1	18.3	$\chi2$=**74.18**
Igbo	31.7	17.8	**Pr=0.0000**
Others	29.9	49.3	
Region			
North-Central	10.1	9.4	
North-East	5.9	8.7	$\chi2$=**219.71**
North-West	10.2	44.4	**Pr=0.0000**
South-East	23.8	10.9	
South-South	14.8	15.6	
South-West	35.2	11.0	
Religion			
Christianity	73.8	67.7	$\chi2$= **4.57**
Islam	25.9	32.3	**Pr=0.3675**
Traditional	0.3	0 .0	
Wealth status			
Poor	4.7	12.6	$\chi2$=**23.44**
Middle	11.0	10.7	**Pr=0.0017**
Rich	84.3	76.7	
Occupation			
Not employed	22.2	23.6	$\chi2$= **0.22**

Employed	77.8	76.4	**Pr=0.6915**
Marital status			
Single	1.9	0.8	
Married	96.6	98.6	**$\chi 2$=3.31**
Widowed	0.8	0.0	**Pr=0.4160**
Separated	0.7	0.7	
Antenatal care visit:			
No	78.1	79.7	**$\chi 2$=0.26**
Yes	21.9	20.3	**Pr=0.6567**
Child spacing			
Less than 12 months	28.4	20.4	
1 year	11.9	8.0	
2 years	26.6	29.7	**$\chi 2$=15.12**
3 years	20.7	27.7	**Pr=0.1281**
4 years	6.9	9.5	
5 years	4.3	4.5	
6+ years	1.2	0.3	
Smokes cigarettes			
No	99.7	1.0	**$\chi 2$=0.69**
Yes	0.3	0.0	**Pr= 0.3942**

4.3: Odds Ratio Based on Logistic Regression Analysis of Socio-Demographic Characteristics and Low Birth Weight.

Table 4.3 below showed the result of logistic regression of the effect of socio-demographic factors on low birth weight. Result from Model 1, reveals that women age 40-44 years were 0.16 times less likely to had low birth weight to women in age 15-19 years (RC). Women from north-west were 5.66 times more likely to had low birth weight than women from north-central (RC). Women from south-west were 0.34 times less likely to had low birth weight to women from north-central (RC).

Result from Model 2, reveals women that space their child birth by 2 years were 95% more likely to had low birth weight than women that space child by less than 12 months (RC). Women age 40-44 years were 0.17 times less likely to had low birth weight to women in age 15-19 years (RC). More so, women from north-west were 4.91 times more likely to had low birth

weight compare to women to from north-central (RC). Women from south-west were 0.32 times less likely to had low birth weight compare to women from north-central (RC). There is significant influence of socio-demographic characteristics of women age 15-49 years on low birth weight, p-value less than 0.05 (Yisak, Abera, Solomon and Haftom, 2017).

Table 4.3: Odds Ratio Based on Logistic Regression Analysis of Socio-Demographic Characteristics and Low Birth Weight.

	Model 1		Model 2	
Background Characteristics	**Odd Ratio**	**Upper-Lower confidence interval**	**Odd Ratio**	**Upper-Lower confidence interval**
Antenatal care visit:				
No (RC)			**1.00**	
Yes			1.12	(0.70-1.78)
Child spacing				
Less than 12 months (RC)			**1.00**	
1 year			1.21	(0.52-2.81)
2 years			1.95*	(1.13-3.33)
3 years			1.63	(0.89-2.97)
4 years			1.64	(0.69-3.85)
5 years			1.73	(0.72-4.11)
6+ years			0.48	(0.06-3.88)
Smokes cigarettes				
No			**1.00**	
Yes			1.00	(0-0)
Age				
15-19 (RC)	**1.00**		**1.00**	
20-24	0.7	(0.28-1.75)	0.62	(0.24-1.59)
25-29	0.61	(0.25-1.47)	0.58	(0.22-1.47)
30-34	0.64	(0.23-1.81)	0.62	(0.21-1.84)
35-39	0.5	(0.2-1.25)	0.52	(0.19-1.37)
40-44	0.16*	(0.03-0.83)	0.17*	(0.03-0.92)
45-49	0.96	(0.17-5.43)	1.13	(0.21-6.03)
Place of residence				
Urban (RC)	**1.00**		**1.00**	
Rural	0.85	(0.52-1.37)	0.85	(0.53-1.38)
Highest educational level				
No formal education (RC)	**1.00**		**1.00**	

Primary	0.76	(0.39-1.47)	0.83	(0.4-1.71)
Secondary	0.63	(0.34-1.18)	0.69	(0.35-1.36)
Higher	0.71	(0.35-1.42)	0.75	(0.34-1.62)
Ethnicity				
Yoruba (RC)	**1.00**		**1.00**	
Hausa	0.45	(0.18-1.1)	0.48	(0.19-1.22)
Igbo	0.65	(0.32-1.29)	0.71	(0.35-1.41)
Others	0.96	(0.51-1.8)	1.05	(0.54-1.98)
Region				
North-Central (RC)	**1.00**		**1.00**	
North-East	1.66	(0.76-3.65)	1.51	(0.67-3.41)
North-West	5.66***	(3.13-10.26)	4.91***	(2.71-8.89)
South-East	0.75	(0.29-1.88)	0.71	(0.27-1.81)
South-South	1.27	(0.66-2.45)	1.17	(0.59-2.32)
South-West	0.34**	(0.17-0.68)	0.32**	(0.15-0.64)
Religion				
Christianity (RC)	**1.00**		**1.00**	
Islam	1.05	(0.6-1.82)	1.09	(0.62-1.93)
Traditional	1		1	
Wealth status				
Poor (RC)	**1.00**		**1.00**	
Middle	0.53	(0.23-1.22)	0.51	(0.22-1.15)
Rich	0.59	(0.29-1.2)	0.6	(0.29-1.22)
Occupation				
Not employed (RC)	**1.00**		**1.00**	
Employed	1.04	(0.66-1.66)	1.05	(0.65-1.70)
Marital status				
Single (RC)	**1.00**		**1.00**	
Married	1.93	(0.44-8.39)	1.75	(0.41-7.51)
Widowed	1		1	(0-0)
Separated	3.45	(0.40-29.68)	2.83	(0.34-23.06)

RC means the reference categories *P<0.05 **p<0.01 ***p<0.001

HYPOTHESIS TESTING

H_1: There is a relationship between women's socio demographic characteristics and low birth weight in Nigeria.

H_0: There is no relationship between women's socio demographic characteristics and low birth weight in Nigeria.

Decision

From the binary logistic regression, the relationship between socio demographic characteristics and low birth weight is statistically significant in ($P< 0.05$), from this, we can conclude that there is a significant relationship between socio-demographic characteristics (Age of women, Region) and low birth weight. Likewise there is a significant relationship between intervening variable (Child spacing) on low birth weight. Therefore we fail to accept the null hypothesis.

4.4 DISCUSSION OF FINDINGS

The decision rule had showed that there was partial statistical relationship between unadjusted result between socio-demographic characteristics and low birth weight whereby there is significant relationship between adjusted result between socio-demographic characteristics and low birth weight.

From the findings the unadjusted result showed that women age 40-44 years were 0.16 times less likely to had low birth weight to women in age 15-19 years (RC).The adjusted result revealed that Women age 40-44 years were 0.17 times less likely to had low birth weight to women in age 15-19 years (RC). This findings was supported by Sharma et al. 2008, it was stated that there is significant relationship between maternal age and low birth weight, whereby infants born to adolescents and women above 35 years tend to be smaller (Sharma, Katz, Mullany, Khatry, LeClerq, Shrestha, Darmstadt and Tielsch, 2008). The determinants of LBW can be broadly classified as genetic, constitutional, obstetric, nutritional, related to maternal morbidities in the antenatal period, toxic exposure-related, and linked to antenatal care (ANC). The adjusted result reported that women that space their child birth by 2 years were 95% more

likely to had low birth weight than women that space child by less than 12 months (RC). It was reported that birth spacing influencing low birth weight (Deshpande, Phalke, Bangal, Peeyuusha and Sushen, 2011).

Further research is needed across the states to generate a broader evidence base of the underlying causes of low birth weight(age of women, region and child spacing) that can inform the design of interventions to tackle these causes at large. Other socio-demographic factors should be tested to know the core causes of low birth weight in the study area.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECCOMENDATIONS

5.0 INTRODUCTION

This chapter is devoted to the presentation of the summary of findings, conclusion and recommendations drawn from the analysis of the research study. The overall objective of this study is to explore the influence of socio demographic characteristics and low birth weight among women in Nigeria. The study was based on the sample size of 2,390 women of reproductive ages in the study area.

5.1 SUMMARY OF THE FINDINGS

With respect to socio-demographic characteristics of women who had low birth weight to those who did not had low birth weight. Results from table 4.1 showed women age 25-29 years by 36.8%, 30-34 years by 27.1%, 20-24 years by 17.7%, 35-39 years by 12.9%, age 15-19 years by 2.5%, the least were age 40-44years and 45-49 years by 2.4% and 0.7% respectively. Women reported to be from urban area by 73.8% and rural area by 26.2%. They had secondary education by 55.2%, higher education by 27.5%, primary by 11.8% and the least were those with no formal education by 5.5%. Igbo women dominate the study area by 30.4%, Yoruba by 28.9% and the least were hausa by 9%. Also, women reported from southern region were by 70.4% and northern region by 29.6%. Christian women reported by 73.2%, muslim women by 26.5% and traditional women by 0.3%. The rich women reported by 83.6%, middle wealth status by 10.9% and the poor women reported by 5.5%. It was reported that women were employed by 77.7% and not employed by 22.3%. Women reported to be married were 96.8%, single by 1.9%, divorced and separated were 0.7% respectively. It was reported that women had no low birth

weight by 90.8% and had low birth weight by 9.2%. Women attend antenatal care visit by 21.7% and no antenatal care visit by 78.3%. Women that space their children by less than 12 months were 27.7%, 2 years were 26.9%, 3 years by 21.3%, 1 years by 11.5%, 4 years by 7:2%, 5years and 6years above were 4.3% and 1.1%. Women that smokes cigarettes were 0.3% and those that did not smokes by 99.7%.

Furthermore, there is a significant association between the following socio- demographic characteristics (level of education, ethnicity, region, religion, wealth index) and low birth weightp-value less-than 0.05.

In the multivariate analysis result showed the effect of socio-demographic characteristics on health care utilization. From model 1, women age 40-44 years were 0.16 times less likely to had low birth weight to women in age 15-19 years (RC). Women from north-west were 5.66 times more likely to had low birth weight than women from north-central (RC). Women from south-west were 0.34 times less likely to had low birth weight to women from north-central (RC).

Result from Model 2, reveals women that space their child birth by 2 years were 95% more likely to had low birth weight than women that space child by less than 12 months (RC). Women age 40-44 years were 0.17 times less likely to had low birth weight to women in age 15-19 years (RC). More so, women from north-west were 4.91 times more likely to had low birth weight compare to women to from north-central (RC). Women from south-west were 0.32 times less likely to had low birth weight compare to women from north-central (RC).

5.2 CONCLUSION

Without any doubt that there is significant influence of socio-demographic characteristics of women age 15-49 years on low birth weight, p-value less than 0.05 (Yisak,Abera,Solomonand Haftom, 2017). Thus this study conclude that base on the facts from the result that some factors such age of women, region, child spacing on low birth weight influenced low birth weight where p-value less than five percent level of significant.

5.3 RECOMMENDATION

The findings suggest that there should more attention on low birth weight of women considering these socio-demographic factors associated with low birth weight such as age of women, region, child spacing. The reduction in low birth weight among women will reduce maternal death during and after birth and also improve the nutritional status of children.

The findings from the study, I would recommend that

1. Different partners in partnership with the Government to address the issue of low birth weight, hence for them to be able to take care of themselves as well as their children.
2. To conduct a qualitative study in the community especially rural settings in or them to have an in depth discussion with regard to low birth weight and in order to compliment the findings from this study.
3. Health care providers should provide information, education; communication programs and improvements in counseling are needed to have knowledge on low birth weight

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