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Impact of Free Maternal and Child Health Services on Health Care Utilization in Jigawa State, Nigeria

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Walden University
2018

Abstract

Impact of Free Maternal and Child Health Services on Health Care Utilization in Jigawa

State, Nigeria

by

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MPH, Ahmadu Bello University, 2005

MBBS, University of Ilorin, 1995

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Health Services

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Abstract

In spite of a decrease globally, the maternal mortality rate (MMR) in Nigeria and its Jigawa State has remained persistently high. Few efforts to address the MMR in Nigeria have been undertaken. The purpose of this study was to investigate the impact of Jigawa State's Free Maternal and Child Health Program (JSFMCHP), education, employment, and parity of pregnant women on health care utilization (the outcome variable), as measured by antenatal care (ANC) visits. Anderson's behavioral model served as the study's theoretical framework. The sample size included 400 antenatal records of pregnant women who were randomly selected from the state's Health Management and Information data collected between 2011 and 2015. Chi-square tests showed a significant association between those who did not participate in the JSFMCHP, education, employment, with ANC. There was no association between parity and the number of ANC visits. The odds ratio suggested that pregnant women who did not participate in the program were 5.53 times as likely to have 4 or more visits compared to those who participated. Furthermore, the recommended number (4 or more) of ANC visits was predicted by tertiary education and employment. This study's findings indicate the need for a reevaluation of JSFMCHP policy, with a focus on ensuring a minimum recommended number of ANC visits for all program participants. These results can influence positive social change if used by policy makers to strengthen policies that have a beneficial impact on maternal morbidity and mortality in Jigawa State, in particular, and Nigeria, in general.

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Dedication

To my late father, Alhaji Ibrahim Dandoka Salisu, in blessed memory.

May his soul rest in peace.

Acknowledgments

I thank almighty Allah for giving me health and the means to reach this stage of the doctoral process successfully. I remain grateful to my family (Maryam, Asmau, Anisa, Habib, Ibrahim, Maimuna, Ishaq, Khadija, Bilkisu, Fatima, and Ummu Kulthum) for the unwavering love and support they offered me throughout the course. I could not have succeeded without their sustained support, understanding, and prayers.

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Chapter 1: Introduction to the Study

Introduction

In most developing countries, conception, pregnancy, and childbirth, all of which are natural processes of human reproduction, contribute significantly to maternal morbidity and mortality as compared to the developed world. Several attempts have been made in the past to reduce the number of maternal deaths using different strategies. The World Health Organization (WHO) reported 289,000 maternal deaths globally in 2013, indicating a 45% reduction from 1990 (WHO, 2010). Ninety nine percent of these deaths occur in developing countries, with the Sub Saharan region having the largest percentage of 62%, and South Asian countries (Afghanistan, Bangladesh, Pakistan, India, and Indonesia) accounting for 24% of maternal deaths (WHO, 2010). India accounts for 17% of the global maternal mortality rate (MMR), while Nigeria accounts for 14% of all maternal deaths (WHO, 2010).

Although the global maternal death rate has gone down from 380 in 100,000 live births in 1990 to 210 in 100,000 live births in 2013, maternal mortality rates in developing countries is still 14 times higher than in the developed world (WHO, 2010). The estimated lifetime risk of maternal mortality is one in 160 in developed nations compared to 1 in 37,000 in the developing world (WHO, 2010). The WHO reported 6.3 million perinatal deaths (3.3 million still births and 3 million early neonatal death) and four million neonatal death in 2006 (WHO, 2006). One third of stillbirths occur during childbirth, and 92% of all these deaths are recorded in the developing world (WHO, 2006). The high MMR and the unacceptably high neonatal mortality rates have raised

concerns about the efficiency and effectiveness of public health programs in the developing world. These concerns were raised in an annual meeting of Africa's ministers of health in Abuja on ways to reduce maternal death in 2009 (Federal Ministry of Health, 2009).

Better maternal and neonatal indices are linked to the utilization of maternal and child health services (MCHS) in low income and middle income countries (Anderson, Axelson, & Tan, 2011). Therefore, high maternal and neonatal mortality are associated with lack of access, unavailability, and poor quality of services delivered across health facilities. Culture in developing countries plays a significant role in the reproductive life of many women, and by extension, influences maternal and child health indices. Early marriage, teenage pregnancy, lack of women's autonomy, and preference for home delivery over institutional delivery all contribute to the poor maternal and child health indices (Adeoye, Anayade, & Fatusi, 2013; UNICEF, 2012).

Access, utilization, quality, and patient satisfaction are key to attaining the United Nations' maternal- and child-related Millennium Development Goals (MDG). While some countries have achieved this target, others are still overcoming challenges in doing so. A progress assessment conducted on MDG 5A (which set a target of a 5.5% annual reduction in MMR from 1990 to 2015) showed that 11 countries were on track, 63 were making progress, 13 were making insufficient progress, and two were making no progress at all (WHO, 2013). To fast track goal attainment, leaders of many developing countries adopted user fee exemption policies to promote and improve access hitherto denied to many poor households in low- and middle-income countries.

Bohren et al. (2014) highlighted the role that free health care played towards actualization of health-related MDGs. Bohren et al. further pointed to the role that out-of-pocket spending for health care played in impoverished households. This cost serves as an additional barrier for use of maternal and child health services. Similarly Ben Ameer, Ridde, Bado, Ingabire, and Queuille (2012) conducted a comparative study in Burkina Faso to demonstrate the impact of out-of-pocket spending on household economy. These researchers showed a decreased level of financial stress on households attending facilities running free health care compared to those charging for services (Ben Ameer et al., 2012).

This chapter is divided into the following section: (a) background information with an overview of MCHS services globally and efforts to improve these services through different mechanisms, including user fee exemption policies; (b) the problem statement; (c) the purpose of the study, including the goals of the study aimed at creating social change; (d) the research questions and hypotheses for the study; (e) the conceptual framework; (f) a description of the study design and methodology; (g) definitions of terms; (h) the assumptions which I presumed to be true in the study; (i) the scope and delimitations of the study; (j) the limitations of the study; (k) the significance of the study; and (l) a summary.

Background

Governments and NGOs have made many efforts to try to improve and/or sustain policies that directly impact the health of mothers and newborns. In 1987, the World Bank, in collaboration with the WHO and the United Nations Population Fund,

introduced the Safe Motherhood Strategy in an attempt to improve the health and wellbeing of mothers and newborns in response to the high maternal and infant mortality rates in many poor nations of the world (WHO, 2003). In order to achieve the set objectives, the Safe Motherhood Strategy has guidelines, management protocols, and series of initiatives to achieve better health for pregnant women, fetuses, and infants (WHO, 2001). The Abuja Declaration followed in 2000 and was ratified by 189 heads of states to improve the socioeconomic condition in the world's poorest countries by the year 2015 (WHO, 2001). The declaration advocated for an increase in the health care budget to 15% from 5% (WHO, 2001). The UN expanded this declaration into the MDGs with eight goals and 18 targets, which were complimented by 48 technical indicators for monitoring (WHO, 2001). MDGs 4 and 5 focused on infant and maternal mortality reductions. While many countries attained the set goals, many have not achieved their target, including those implemented in Nigeria.

In 2010, the MDG Office of the Presidency, in partnership with National Health Insurance Scheme (NHIS), selected seven states as pilots for MCHS user fee exemption programs (NHIS, 2010). Jigawa State is among those that embraced the free MCHS program as a way of reducing the high maternal and infant mortality rates in the state and further positioning itself to achieve the health-related MDGs. Jigawa State is one of the poorest states in Nigeria. In an effort to reduce the high maternal and infant mortality in the state, officials in the state launched the Jigawa State Free Maternal and Child Health Program (JSFMCHP) through the Ministry of Health (MOH) in addition to a NHIS-MDG program to improve access and utilization (MOH, 2011). The program is aimed at

reducing the inequality in access posed by the lack of finances faced by a majority of state citizens (MOH, 2011).

Dzakpasu, Powell-Jackson, and Campbell (2014) conducted a study on user fee impact on utilization and found an increase in hospital deliveries and managed complications but no evidence regarding inequality. The authors reviewed 20 studies, many whose authors did not take into consideration potential bias such as secular trends (Dzakpasu et al., 2014). Some of the studies were devoid of statistical significance (Dzakpasu et al., 2014). In contrast, Ganle, Parker, Fitzpatrick, and Otupiri (2014) demonstrated the importance of both the demand and supply aspect of the user fee exemption program, rather than focusing solely on patient related factors. The authors demonstrated the importance of quality, availability of drugs, and staff motivation (Ganle et al., 2014).

Although many studies have been conducted in neighboring countries and researchers have indicated that the user fee exemption improved access and utilization, there has been no attempt in Jigawa State thus far, according to my review of the literature, to assess the impact of the JSFMCHP on utilization. The JSFMCHP program provides free health care services to pregnant women, lactating mothers, and children under the age of 5. Services rendered included antenatal care, health education, cesarean section, delivery services, immunization, nutrition services, folate, and fersolate supplementation, growth monitoring, and management of complications.

Problem Statement

The Nigerian health care system's ineffectiveness and inefficiency are largely due to poor budgetary allocation and mismanagement of meager resources allocated to health care, according to NHIS (2010). High out-of-pocket expenditures and poverty are the main barriers identified in accessing health care services in Nigeria (NHIS, 2010).

According to the WHO, Nigeria has a MMR of 630/100,000 live births, although there are disparities across the country's six geopolitical zones (NHIS, 2010). This rate is high compared to other African nations. South Africa has a MMR of 300/100,000; Namibia, 200/100,000; Algeria, 97/100,000; and Egypt, 66/100,000 (WHO, 2005). According to the Jigawa State Ministry of Health (2010), the MMR for the state in 2010 was 1000/100,000 live births.

Over 80% of the Nigerian population lacks any form of insurance. These individuals bear the most significant burden of health problems such as malaria, hypertension, diarrheal diseases, whooping cough, antepartum hemorrhage, puerperal sepsis, anemia, and acute respiratory tract infections (NHIS, 2010). Because pregnant women are the most vulnerable group within this population, it is critical to address their needs, access, and desired outcomes. A study conducted in Sierra Leone showed an increase in utilization of hospital services by pregnant women participating in a free MCHS program (De Allegri et al., 2011). However, authors of another study in Burkina Faso observed no effect on utilization, despite the user fee exemption (Treacy & Sagbakken, 2015). Bado et al. (2015) demonstrated an increased demand for treatment

and delayed reduction to access to care with user fee exemptions in community case management of malaria in rural Burkina Faso.

Although there are studies on free health care and pregnancy outcomes in other countries, there is, as of yet, no study on whether Jigawa State's free health care program has any impact on utilization, particularly on the number of antenatal visits in the state. Many experts feared that both federal and state governments in Nigeria, including donor agencies, might not be able to sustain free maternal and child health (MCH) services across the country (Nove, Hulton, Martin-Hilber, & Mathews, 2014). Others contended that such programs might compromise quality, as the money realized from services is used for daily activities that promote quality of services (Amnesty International, 2011).

Researchers have yet to study the impact on health care utilization of the NHIS-MDGs and free maternal health services in some states across the country (WHO, 2014b). Amid dwindling resources, the MMR (1000/100,000 live births) has remained high in the state. I addressed this issue by examining the impact of free MCHS programs on utilization as measured by ANC visits in Jigawa State, Nigeria.

Purpose of the Study

The purpose of this cross-sectional quantitative study was to investigate the impact of the JSFMCHP on antenatal visits. The period of study was from 2011 to 2015 (5 years). The independent variables were JSFMCHP, education, employment, and parity, while the dependent variable was ANC visits. In conducting the study, I sought to fill in the gap identified in the literature with the goal of adequately informing policy makers on the need to continue, modify, or terminate JSFMCHP.

Research Questions and Hypotheses

The research questions that informed this study are as follows:

RQ1: What is the association between JSFMCHP and the number of ANC visits?

H₀1: There is no association between JSFMCHP and the number of ANC visits.

H₁1: There is an association between JSFMCHP and the number of ANC visits.

RQ2: What is the association between the education of pregnant women in Jigawa State and the number of ANC visits?

H₀2: There is no association between the education of pregnant women in Jigawa State and the number of ANC visits.

H₁2: There is an association between the education of pregnant women in Jigawa State and the number of ANC visits.

RQ3: What is the association between the employment of pregnant women in Jigawa State and the number of ANC visits?

H₀3: There is no association between the employment of pregnant women in Jigawa State and the number of ANC visits.

H₁3: There is an association between the employment of pregnant women in Jigawa State and the number of ANC visits.

RQ4: What is the association between parity of pregnant women in Jigawa State and the number of ANC visits?

H₀4: There is no association between parity of pregnant women in Jigawa State and the number of ANC visits.

H₁4: There is an association between parity of pregnant women in Jigawa State

and the number of ANC visits.

Theoretical Framework for the Study

A theoretical framework can serve as a vehicle to understand complex human behavior (Fishbein & Ajzen, 2010). The Andersen model was used for this study. This model offers a flexible way of exploring both environmental and individual factors that explain the usage of health services (Andersen & Newman, 2005). The model also indicates how individual decisions are influenced toward health care service utilization (Andersen, 1968).

The model consists of three main features: (a) predisposing characteristics, (b) enabling characteristics, and (c) need characteristics. Following revision by Andersen, the three tenets were grouped as population characteristics (Andersen, 1995). The ideas around health care systems, use of health services, and customer satisfaction were developed later, and further revision included primary determinants, health behavior, and health outcomes (Andersen, 1995).

Andersen's model is all encompassing in presenting the parts played by health care systems, socioeconomic status, demographics, and the utilization of health services. In my study, JSFMCHP, education, employment, and parity were the key constructs used in the model to explain the use of health care services measured by the number of ANC visits. Table 1 shows how the three Andersen model constructs are linked with the study's independent and outcome variables.

Table 1

Linkages between the Andersen Model Constructs and the Independent and Dependent Variables

Tenets	Independent variable	Outcome
Predisposing characteristics	Education Employment Parity	Number of ANC visits
Enabling characteristics	JSFMCHS	Number of ANC visits
Need characteristics	Parity	Number of ANC visits

Nature of the Study

The study was a quantitative, cross-sectional design. The independent variables are JSFMCHP, education, employment, and parity, while the dependent variable is the number of ANC visits. A cross-sectional study was used across five years (2011 – 2015). The study therefore measured the effect of the independent variables on the dependent variable (number of ANC visits).

Secondary data from the state ministry of health contained in the Health Management Information database was used, because the antenatal records of all those who were admitted to the 12 state general hospitals and 10 primary health centers are stored in the database. In addition, socio-demographic data on age, sex, marital status, geographic location, education, and employment will also be available from the records, as well as information on immunization, inpatient admissions, and under-five, mortality records. My study is largely an impact assessment effort for JSFMCHP.

Definitions

Antenatal care: Services rendered to a pregnant woman by health care providers (doctors, nurses, and midwives), which include physical examination, immunization, disease screening, health education, antimalarial (sulphadoxine and pyrimethamine combination), and hematinics (fersolate) drug provision, and treatment. It usually begins the first trimester and extends to the third trimester.

Antenatal care visit: A visit to health facility by pregnant mothers for the purpose of a safe pregnancy and delivery (WHO, 2006).

Autonomy: The degree to which a woman can assert her rights on issues of reproductive health.

Health care utilization: Health care services used by those in need of those services (Segen, 2005).

Home deliveries: An instance of giving birth at home rather than in a hospital (UNICEF, 2014).

Institutional deliveries: Hospital deliveries (UNICEF, 2014).

Lifetime risk: The probability of a woman dying from childbirth in her lifetime.

Maternal death: “The death of a woman while pregnant or within 42 days of termination of pregnancy, from any cause related to or aggravated by pregnancy or its management, irrespective of the duration and site of the pregnancy, but not from accidental or incidental causes” (WHO, 2013).

Maternal mortality rate: “Annual number of female deaths per 100,000 live births from any cause related to or aggravated by pregnancy or its management, excluding

accidental or incidental causes” (WHO, 2013).

Maternal mortality ratio: Number of maternal deaths per 100,000 live births in a given year (WHO, 2013).

Neonatal mortality rate: “Number of deaths in the first 28 days of life per 1000 live births” (WHO, 2010).

Out-of-pocket payment: Cash payment made by patients at the point of receiving health care services (MOH, 2010).

Parity: “Number of times a woman gave birth to a twenty-four weeks or above fetus regardless of whether alive or stillborn” (UNICEF, 2014).

Traditional birth attendant: Otherwise called a local midwife; usually an old woman who provides pregnancy and child-care in the community

Health worker: Trained personnel (doctor, nurse, midwife, or community health extension worker) who offers health care services.

Skilled birth attendant: A health worker who provides health care services during pre- and postnatal periods (UNICEF, 2014).

User fee: A mandatory payment made by patients for receiving health care services (MOH, 2010).

Use Fee Exemption Policy: A deliberate government plan to provide health care services free for patients (MOH, 2010).

Assumptions

I made the following assumptions to guide this study:

1. Secondary data (antenatal records) from the 12 general hospitals and 10

primary health centers captured those pregnant women who used the MCH services during the assigned time period.

2. The advantages (saving time and money) of using secondary data far outweigh the disadvantages of using such data.
3. The use of ANC services depends on predisposing factors as shown by the Andersen model that include biological (parity) factors and socioeconomic (education, employment) factors. These predisposing factors dictate whether a woman uses antenatal services provided.
4. The use of ANC services is based on enabling factors (availability of health care services, access, and cost of services). This is important as a determinant in health care utilization.
5. The use of ANC services depends on health care delivery system characteristics that include policies (JSFMCHS), resources, organization, and financial arrangements influencing uptake of ANC services.

Scope and Delimitations

For this study, I used data from the state's 12 general and 10 primary health centers using the free health care program in the state; as such, I did not include data from many primary health centers as well as the few private hospitals operating in the state. The Health Management and information data indicated utilization patterns of ANC services across five years (2011 to 2015) in the state; because the goal of the study was to prove relationship rather than causation, the study's conclusions did not indicate that the policy change (JSFMCHP) caused changes in ANC visits.

Limitations

When analyzing facilities' ANC records, I assumed there would be the usual methodological flaws inherent in primary data collection. In the beginning, there were problems with the data set not known to the investigator, and convenience sampling in secondary data affected the external validity of the study because the results could not be generalized. Validity and reliability of results were affected by incorrect entries, duplicate entries, and incompleteness of the data set. Another important limitation of the study was the exclusion of many (685) primary health care facilities and private health care providers in the data set. This omission is significant as most pregnant mothers live in rural areas with no secondary care facilities.

Significance

The study was significant because it assessed the effectiveness of the JSFMCHP program with regard to utilization measured by ANC visits. In addition, the study produced new information on the role of other covariates touching on biological, socioeconomic, and need characteristics. The impact assessment offered evidence-based findings to policy makers to make informed decisions on how best to reposition, adjust, modify, or, in a worst-case scenario, terminate the program. Recommendations arising from the study would enhance and facilitate the reduction of morbidity and mortality in pregnant women, and by extension, their unborn children.

Summary

Research conducted on the impact of user fee removal as a vehicle of improving and enhancing utilization have mixed outcomes (Maini et al., 2014). While some studies

showed remarkable improvement in health care utilization, others demonstrated reduced quality, workers fatigue, and decreased motivation in health care workers (Ganle et al., 2014). The study revealed the impact of JSFMCHP on utilization by answering the research questions, with the aim of better understanding the role of other factors. The Andersen Model served as the theoretical foundation for this study, as all variables in the study are captured by three tenets of the model. Finding the role user fees played in health care utilization in Jigawa State will help modify, adjust, and strengthen the state health care delivery system in general.

In Chapter 2, I present an introduction, followed by the literature search strategy, theoretical framework, and review of the literature. The review includes background information on Jigawa State background and a discussion of the literature on health care financing, ANC visits, education, employment, and parity. A summary and conclusion form the last segment of the chapter.

Chapter 2: Literature Review

Introduction

Jigawa State is among the poorest in Nigeria, alongside Kebbi, Zamfara, Adamawa, and Sokoto, with a poverty rate that was over 70% in 2013 (National Bureau of Statistics, 2014). Incidentally, it also has one of the highest MMRs (1000/100,000 live births) in the country (NHIS, 2010). The intent of this chapter is to review the most recent literature on the effect of free health care on access and utilization of maternal and child health services. The review will cover the role of health care financing on access and utilization, as well as the quality of MCH services globally. The review will include studies whose authors evaluated user fee roles on MCH service utilization. Access, utilization, and quality are key components of any viable health care delivery system (WHO, 2010). Access promotes prevention. Prompt diagnosis and timely intervention have a positive impact on the quality of life, longevity, and maternal morbidity and mortality (WHO, 2010).

Use of the JSFMCHSP may result in increased use of MCH services. As a poor state, its citizens are faced with financial challenges in accessing care on a daily basis. Thus, the JSFMCHSP program may ultimately remove such barriers and reduce household impoverishment, which has the potential to profoundly impact MCH utilization and serve as a vehicle for attaining MDG Goals 4 and 5. In this study, I also examined constructs of interest (education, employment, and parity) to learn about their impact on utilization, as measured by ANC visits. In this chapter's literature review, I holistically consider the role of free MCH services, education, employment, and parity on

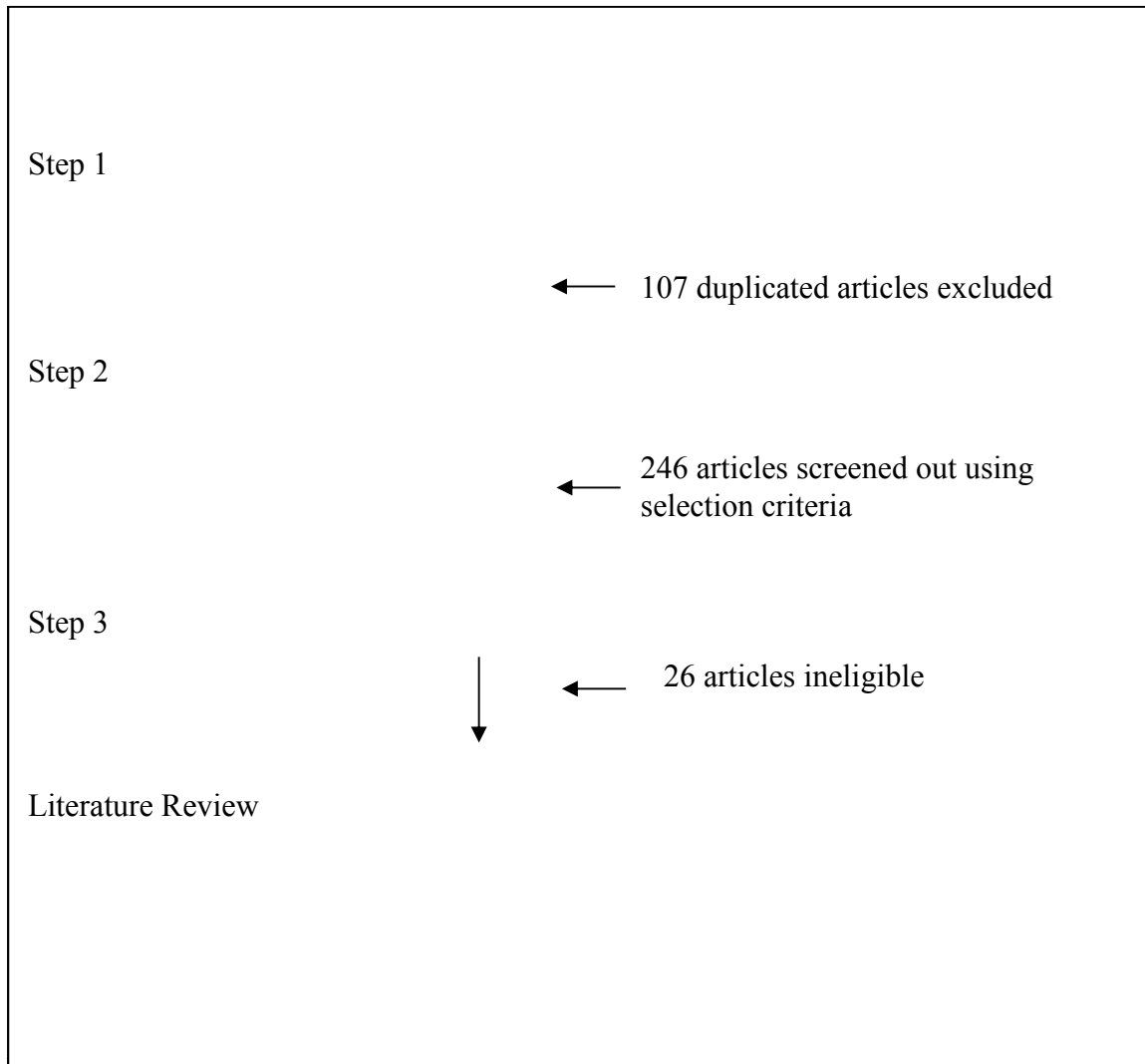
service utilization, as measured by ANC visits, in the developing world, and in middle-income countries like Nigeria.

Literature Search Strategy

As I searched the literature, I specifically sought out research related to the impact of user fees on utilization of MCH services in low- and middle-income countries. I used Walden University Library databases for this study. These included Social Science Direct, MEDLINE, CINAHL, SAGE, Nursing and Allied Health Source, and the ISI Web of Science databases. I also searched the United Nations websites for the World Health Organization, the United Nations International Children's Emergency Fund, and the United Nations Population Fund; developmental agencies websites USAID and DFID; and websites of the Federal Ministry of Health, National Primary Health Care Development Agency (NPHCDA), and the National Health Insurance Scheme (NHIS). Additionally, I used the PubMed, ProQuest, and EBSCOhost search engines. I also included peer-reviewed articles from PsycArticles and PsycINFO and peer-reviewed papers presented at conferences and symposia. Search terms used were *user fee, free health care, community based health insurance, health insurance, health care utilization, health care access, maternal health, antenatal care, perinatal care, parity, employment, education, middle and low income countries, developing countries, Sub Saharan Africa, and Nigeria*.

From these sources, I obtained a total of 450 articles, 107 of which I removed because they were duplicates. I removed another 246 because they were qualitative studies or had been conducted in the developed world. In the end, I chose 73 articles for

review because the authors focused more on supply side rather than demand aspect of the health care delivery that deals with the free health care policy (see Figure 1 for an illustration of my search strategy process).



Theoretical Framework

User fees are one of many factors responsible for the use of health services in general, and MCH services in particular. Researchers over the years have not used any theories or conceptual framework in explaining reasons behind health care service utilization (Asch et al., 2006; Dao, Waters, & Le, 2008; Gillum, Jarrett, & Obisesan, 2009; Peltzer, 2009); some have adhered to the usage of conceptual and theoretical framework for their studies as the basis for explaining health care utilization. The role of poverty on health care utilization was explored through four dimension of access theory (Peters et al., 2008). Hoerster, et al. (2011) used a combination of behavioral and economic models to find the impact of several factors on utilization. Sofaer and Firminger (2005) used the Patient Perception of Quality Model to explain factors responsible for utilization. Many studies fall short of using models that utilized multiple characteristics rather than isolated factor in explaining usage. For example Young (1981) used the Choice Making Model on illness gravity, Suchman's (1965) employed the Stage of Illness and Medical Care Model. These all fall short in looking at environmental factors responsible for health care utilization, as the model do not incorporate the environmental tenet. Straus, Tetrue and Grahams (2011) used the Knowledge-to-Action Cycle to explain knowledge translation, defined as putting knowledge to action, or using knowledge in decision making. In that study it was found that knowledge of available services ultimately led to health care utilization (Straus et al., 2011). The Use of Health Belief Model was used by Salifu (2016) to explain delivery outcomes in Sierra Leone under the free health care services in the West African country. On the other hand, Umar

(2016) used the Andersen Model in explaining use of maternal services among women in Nigeria.

The most common framework used in the analysis of health care utilization by patients is the Andersen model (Andersen, 2000; Umar 2016). This framework encompasses individual, environmental, and provider-related factors that influence health care utilization under a system (Andersen, 2000; see Figure 3). The model consists of three components: predisposing factors, enabling factors, and need factors (Andersen, 1968). The predisposing factors are comprised of demographic information (age, gender, etc.); social structures are defined by education, employment, income; and attitudinal beliefs (Andersen, 1965). While enabling factors include family resources and community characteristics, need factors include perceived and evaluated needs as branches (Andersen, 1968). Andersen (1968) posited that individuals' use of health services is impacted by three factors: how likely they are to use the service, what might enable or impede their use of the service, and how much they need the service. The framework was later revised in 1995 to cater to environmental variables that comprise health care delivery system characteristics, external environment, and community-level enabling variables (Andersen & Newman, 2005). The health care delivery system characteristics of the framework fall under the environmental variables. They include policies, resources, organizations, and financial arrangements that influence acceptability, access, and usage of health services (Andersen & Newman, 2005). The JSFMCHP as a state policy falls under health care service delivery, while parity, education, and employment all are within population characteristics. JSFMCHP and parity, education,

and employment all have linear relationships with MCH service usage.

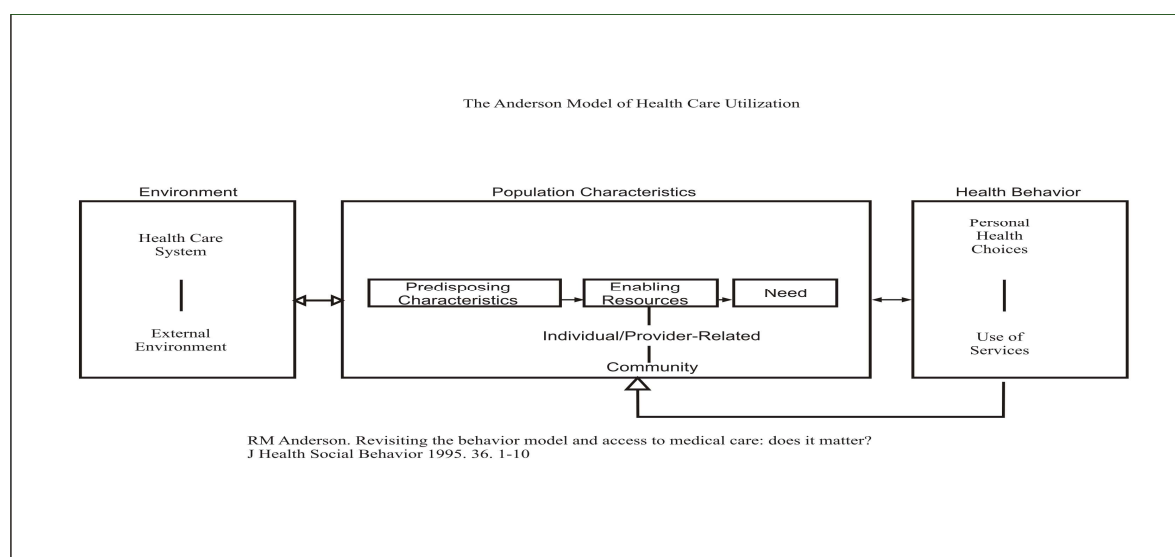


Figure 3. The Anderson model of the use of health care. Adopted from Umar, 2016, use of maternal health services and pregnancy outcome in Nigeria.

Literature Review Related to Key Variables and Concepts

Background of Jigawa State

Geography. Jigawa State is one of the 36 states of Nigeria and was carved out of Kano State on August 27, 1991. It is located in the northwestern geopolitical zone of Nigeria, which is comprised of seven states that include Kano, Katsina, Jigawa, Kaduna, Sokoto, Kebbi, and Zamfara (see Figure 2). The state has borders with Kano and Katsina in the west, Bauchi in the east, and Yobe in the northeast, and it shares an international boundary with Niger Republic in the north. Jigawa's dry season runs from October to May, and the rainy season is from June to September, with record temperatures as high as 42⁰C during the dry season from March to September, and lower temperatures (10⁰C) during Harmattan from November until the end of February (JSMOH, 2009).



Figure 2. Map of Jigawa State.

Population size, distribution, and composition. Jigawa is the 8th most populous state in Nigeria according to 2006 census figures. With a population of 4,348,649, it is comprised of 51% (2,215,897) males, and 49% (2,132,752) females (National Population Commission, 2006). Over 85% of the people live in rural areas. Life expectancy according to the National Bureau of Statistics is 47.8 years for men and 48.5 years for women. The state has a homogenous distribution of the major tribes. Hausa/Fulani tribes are found all over the state, with Mangawa and Badawa predominantly found in the northeastern part of the state. Hausa is the most widely spoken language in the state.

Political landscape. The state has 27 local governments, each headed by a democratically elected local council, comprised of a chairman, vice chairman, and 10 counselors representing 10 wards. Jigawa, like its sister states in the Nigerian federation,

is governed by a governor as the head of the executive arm, a speaker of the house as head of the legislators, and the state chief judge overseeing the judiciary (MOH, 2010).

Socioeconomic environment. According to the National Bureau of Statistics, 68.7% of the state indigenes are self-employed, and 70% of them engage in subsistence agriculture. In the rainy season, rainwater is utilized for farming purposes, and the citizens engage in irrigation during the dry season. Most of the indigenes have a Quranic education, 81.3% of households do not have any form of formal or western education, and only 4.4% have a tertiary education (JSMOH, 2009). Most state revenue (80%) comes from federal transfer while 10% is generated internally, and the remaining 10% comes from loans from the African Development Bank, the Islamic Development Bank, and the International Bank for Reconstruction and Development (JSMOH, 2009).

Health care system. There are three levels of care in Jigawa state. The federal government is responsible for the tertiary care provided through the Federal Medical Center located at Birnin Kudu, and the state is responsible for providing secondary care through one specialist hospital, 12 general hospitals, and three cottage hospitals, while the local governments are responsible for primary health care services. There are few private health care facilities in the state due to its indigent nature. The state Ministry of Health and the primary health care agency are responsible for formulating and executing health policies, as well as translating federal health policies for local implementation. At present, the state is the pace setter for implementing primary health care under one roof, where each ward in the state is expected to have one primary health center. It is pertinent

to mention that the health sector was allocated over 15% of the state budget in 2017, as recommended by the World Health Organization.

Health Care Financing

Health care disparities, access, utilization, and quality of care are all directly related to health care financing. Cost remains the biggest barrier to accessing health care globally, and the degree to which it serves as a barrier depends on the health care financing approach adopted by different countries. Health insurance (public, private, and community health insurance), user fees, donor funding, development agency funding, tax finance, and out-of-pocket spending are the various ways countries finance their health care. While some used combinations of private and public insurance systems as in the US, others chose public insurance alone to cover all citizens like in the UK. It is worth mentioning that social health insurance as a vehicle for accessing health care is still in its infancy in most parts of Sub-Saharan Africa. User fees are the most common way citizens in developing countries finance their health care, and hence, families and individuals only access health care if they have the finances. In the end, this creates inequality, as only those with money have access to health care services (Ponsar et al., 2011). In a study of non-maternal ailments among women in rural India, it was found that 68% of the respondents were barred from accessing health care services due to financial constraints, and the majority (67.9%) borrowed to take care of their medical bills (Gopalan & Durairaj, 2012). Costs associated with user fees were further shown by Johnson, Goss, Beckerman, and Castro (2012) to create inequality and household

financial insecurity. As part of the advantages to user fees, the authors argued that they promote and sustain quality and positive health outcomes (Johnson et al., 2012).

A population-based survey conducted from 2003 to 2006 by Medicins Sans Frontiers (MSF) in the Democratic Republic of Congo, Chad, Mali, Sierra Leone, Burundi, and Haiti studied the impact of user fees on health seeking behavior and access. It was found that 30 to 60 % of those in need of health care were actually barred due to lack of money, and the user fee abolition increased access across all socio-economic groups, although its impact among the poor and vulnerable groups was only between 1% and 3.5% (Ponsar et al., 2011). The findings of Ponsar et al. (2011) were similar to Maluka's (2013), who found that pro-poor exemption policies and programs were better implemented in some regions, largely due to provider incentives, and constant supervision. In addition, inability to identify poor households in some regions resulted in poor implementation, in contrast to other regions where the poor were identified all through from the villages, wards, health facilities, up to the districts (Maluka, 2013). In developed countries, antenatal care services are linked with provider incentives. There was evidence of improved antenatal care in terms of quality and the quantity of services offered alongside provider incentives, but no evidence was found on either maternal or newborn mortality (Eichler et al., 2013).

A pilot study on performance-based financing (PBF) in Yobe State, Nigeria further showed the impact of performance-based financing (PBF) on antenatal care and skilled birth deliveries (Ashir, Doctor, & Afenyadu, 2013). The findings were in agreement with Ponsar et al. (2011) and Maluka (2013). The findings were in line with

efforts toward attaining Millennium Development Goals for maternal and child health in the state (Ashir et al., 2013). Study results noted increased and improved utilization of antenatal care services and skilled delivery (Ashir et al., 2013). A similar move to fast track MDGs attainment in Rwanda was initiated through pay for performance (Basinga et al., 2011). The findings of that study showed an increase in facility delivery by 23%, and an increase of 56% for preventive visits to health care providers for children under 23 months, but showed no improvement in women completing four antenatal visits or children receiving full immunization (Basinga et al., 2011). As argued by Ashir et al. (2013), on the need to increase utilization of maternal and child health services through provider incentives, Stanton, Higgs, and Koblinsky (2013) hold same view. In 2012, with support from United States Agency for International Development (USAID) and the Institute of Health, experts reviewed evidences on financial incentives on both the demand and supply side (Stanton et al., 2013). The authors concluded that increased usage and quality of maternal and health services were linked to pay for performance, while there was no evidence linking positive pregnancy outcomes to financial approaches (Stanton et al., 2013). Although performance based initiative brought about improvement on targeted services like institutional delivery, no evidence was found on neonatal health service, maternal mortality ratio, or neonatal mortality rate (Eichler et al., 2013). The findings of Stanton et al. (2013) is similar to that of Eichler et al. (2013) on improved content of antenatal care under performance based initiatives. Provider incentives serve as catalysts for performance in user fee exemption policies in many low-income countries. In Tanzania, financial incentives offered to health care providers were found to

increase uptake of maternal and child health services as well as quality (Morgan et al., 2013). User fee exemption strategies together with financial incentives provided a two way solution by allowing access to maternal and child health services hitherto denied due to finances, and at the same time served as a relief to providers faced with increasing numbers of patients (Morgan et al., 2013).

Two studies conducted in Ghana and Senegal in 2006 and 2007 showed the role of user fees on exemption policies (Witter, Armar-Klemesu, & Dieng, 2008). The focus of the studies were to reduce the financial barriers for maternal and child health services in poor regions, and later augment using national resources in the two countries (Witter et al., 2008). The findings showed increases in the number of antenatal care visits, facility delivery, and cesarean sections, and marked reduction in access inequality (Witter et al., 2008). It is worth noting that at no time did the exemptions go down to zero due to insufficient budgetary provision in Ghana, and reimbursement failure in Senegal (Witter et al., 2008). It was concluded that geographical access, provider incentives, and strong committed leadership was needed for user fee exemption policies to have significant impact (Witter et al., 2008). Similarly, Xu et al. (2006), using data from the National Household Survey conducted in 1997, 2000, and 2003 in Uganda, found that there was marked increases in utilization of health services by the poor compared to rich citizens. However, the researchers cautioned countries adopting user fee exemptions to note which services were paid for with user fee proceeds, with the aim of finding ways to continue financing such activities (Xu et al., 2006). Witter, Arhinful, Kusi, and Zakariah-Akoto (2007) showed how the lack of sustained budgetary allocation affects the sustainability of

user fee exemption policies, as Witter et al. (2008) also did in Ghana.

While efforts to ease the burden that user fees imposed on the poor were desirable, it was important to look into the effect of user fee removal. In Afghanistan, pre- and post-user fee exemption data was scrutinized regarding utilization and quality of services (Steinhardt et al., 2011). Results from that study showed a 400% increase in utilization in those facilities that did not charge for services and drugs, with no difference in quality as well as facility delivery (Steinhardt et al., 2011). Steinhardt et al. (2011) noted the need for more staff, and other consumables, in order to create sustainability for the increasing number of patients due to the fee removal. A systematic review of the literature on the aftermath of user fee removal by Ridde, Robert, and Meessen (2012) concurred with Steinhardt et al. (2011). The authors demonstrated increased utilization of services, increased workload leading to decreased morale of health workers, lack of information on services captured under the program, drug shortages, insufficient funding, and poor planning and organization (Ridde et al., 2012). These issues arising from user fee exemptions should be borne in mind during planning, organisation and execution for the target audience to maximally benefit from the program. The effect of user fee exemption on out-of-pocket expenditure was investigated in Burkina Fasso (Ridde et al., 2015). Findings showed a general decline in out-of-pocket spending across all socio-economic groups, not limited to the poorest (Ridde et al., 2015).

Dzakpasu, Powell-Jackson, and Campbell (2013) showed increases in facility delivery, and the number of complications associated with managed deliveries with user fee removal, with little evidence on health outcome and inequalities. Also, a systematic

review of 47 articles by Salam et al. (2014) showed proportional increases in utilization of maternal health services, and skilled birth delivery with user fee exemption policies, maternal vouchers, and a community health insurance scheme. Similarly Dzakpasu and Powell-Jackson (2014) found an increase in facility delivery with user fee removal, but its impact on inequality in access could not be ascertained. Another study conducted by McKinnon, Harper, & Kaufman in ten Sub-Saharan African countries was in agreement with the findings of Salam et al. (2014) and Dzakpasu and Powell (2014). The authors found increases in facility deliveries by 5%, and a reduction in neonatal mortality rate by 9% (McKinnon, Harper, & Kaufman, 2015). However a study conducted in South Africa showed only increased utilization of maternal health services measured by ANC, not skilled birth delivery (Gilson & Schneider, 2006). A study on the outcome of user fee exemption and why the program produces such outcomes in African countries further supports the findings of Salam et al. (2014) on increase utilization affecting ANC, and skilled birth delivery (Robert, Ridde, Marchal, & Fournier, 2012). In spite of increased utilization due to user fee exemption policies, quality of maternal and child health services remain a concern in the quest to attained MDG goals 4 and 5 (Richard, Witter, & De Brouwere, 2010).

Masiye, Chitah, and McIntyre (2010) conducted a study in Zambia on the impact of user fee abolition fifteen months after its inception. The findings showed increases in utilization among those aged five years and above in rural areas, and in the poor socio-economic class (Masiye et al., 2010). The study further revealed that in spite of pressure on drugs, quality perception with regard to services was quite positive. There is a need to

not trade off utilization with some key issues related to user fee exemption policies.

McPake, Brikci, Cometto, Schmidt and Araujo (2011) cautioned not to rush implementation of user fee exemption policies without considering their impact on human resources, revenue gaps, drugs and other consumables, and staff workload.

Another study, conducted two years after user fee exemption policies were launched in Ghana, Nepal, Sierra Leone, Zambia, and Zimbabwe, supported these findings, and added that coordination between human resources for health and health care financing was key to the success of the free health care policy (McPake et al., 2013). Opwora et al. (2015) shared the same view with respect to the revenue loss that was used for staff support, non-drug needs, and travel. In essence, countries introducing user fees had to carefully plan to mitigate what could come up, secondary to the policy execution.

Similarly Lang'at and Mwanri (2015) demonstrated that increases in facility delivery in Kenya were complicated by bottlenecks, like stock-out in drugs and other consumables, staff shortages, increased workloads, and delayed reimbursement.

In another study, conducted by Leone, Cetorelli, Neal, & Matthews in Nigeria, Ghana, Burkina Faso, Zambia, and Cameroon, the authors found a 27% increase in facility delivery compared to cesarean sections, with a 0.7% increase among people from low socio-economic class, less educated individuals, and the poor (Leone, Cetorelli, Neal, & Matthews, 2016). In spite of increasing access generally, equal access to all remained a big challenge. El-Khoury, Hatt, and Gandaho (2012) found that wealthy women accounted for 58% of cesarean sections, compared to 27% completed for poor women under the free maternal and child health services in Tanzania. The impact of the user fee

exemption was more pronounced in Burkina Faso compared to Ghana, and was attributed to income and level of education (Leone et al., 2016). To further show the impact of free MCH on facility delivery, Johri, Ridde, Heinmüller, and Haddad (2014) found maternal mortality was decreased through increased institutional delivery. Bosu et al. (2007) studied two poor rural communities in Ghana, where free maternal and child health services were offered. Those authors, like Johri et al. (2014), discovered a reduction in maternal mortality rate in the two districts studied, although the findings were not statistically significant. The methodology they utilized was trained midwifery staff documenting women's deaths from the ages of 15 to 49 years during the study period. Their findings cannot be directly linked to the user fee removal. Statistically significant findings were uncovered in a different region in Ghana by Dzakpasu et al. (2012), using a digital surveillance system that covered all women within the reproductive age bracket in the area studied. However, the authors focused on the percentage of facility deliveries, the percentage of women enrolled in the program, and socioeconomic measures, not maternal mortality rates.

Perinatal mortality was decreased through oral dehydration therapy for diarrhea, antibiotics for pneumonia, and Artemisia for malaria (Johri et al., 2014). Similarly, the effect of user fee exemption was shown by James, Morris, Keith, and Taylor (2005) to decrease under five mortality by 230,000 annually. In contrast, Hatt, Makinen, Madhavan, and Conlon (2013) found no effect on maternal mortality and perinatal mortality, but recorded increases in facility delivery and cesarean sections. These findings by Hatt et al. (2013) came from a review of research conducted over three

decades on the impact of user fees on both maternal and perinatal morbidity. The authors demonstrated inconclusive impact of user fee removal on quality and input sufficiency (Hatt et al., 2013). Delamou et al. (2015) demonstrated an increase in hospital admissions from 49% to 66% in four years after the introduction of free obstetric care in Guinea. These admissions were for all complications in rural areas, and only those with severe complications in urban areas. Delamou et al. (2015) further showed a decrease in maternal deaths from 1.5% in 2008 to 1.1% in 2012, and an increase in neonatal deaths by 3% in the same period.

In a bid to attain maternal MDG, efforts must be balanced on both the demand and supply side of any MCH program in developing countries. Ganle, Parker, Fitzpatrick, and Otupiri (2014) observed that putting more emphasis on issues affecting patients alone downplays the lack of capacity in hospitals running free MCH services in dealing with quality obstetric services in the event of complications. Although the authors showed increases in supervised delivery by 8% over three years, there were decreases in skilled attendance, and increases in maternal deaths (Ganle et al., 2014). In addition, the authors brought to the forefront the importance of inequality, access, and utilization of MCH services as impediments to achieving maternal MDG goals (Ganle et al., 2014). Distance to facility, antenatal care staff attitude, and waiting time were additional barriers for maternal MDG, even with the best free MCH services (Hadley, 2011).

Study findings on user fee abolition in many countries are inconsistent. While many showed positive effect, others dwelled more on the negative outcome of the policy. Abdu, Mohammed, Bashier, and Eriksson (2004) and James et al. (2006) showed mixed

effects of user fee removal on access and utilization. However, studies by Akashi et al. (2004), Masiye et al. (2010), and Dzakpasu (2014) showed a positive effect on both access and utilization of maternal health services. Inconsistencies were further demonstrated by Audibert and Mathonnat (2000), Liu and Mills (2002), Meuwissen (2002), Jacobs and Price (2004), and Laterveer et al. (2004), who showed negative effect of user fee removal on health care access and utilization.

De Allegri et al. (2011) found that the policy promotes equity in access across all socio-economic strata, and increased the number of antenatal visits, alongside facility delivery. This, of course, is not enough as many factors has to be taken into consideration to ensure success of the policy (De Allegri et al., 2011). Carasso, Lagarde, Cheelo, Chansa, and Palmer (2012) agreed with the findings of De Allegri et al. (2011), and further found increased staff motivation in spite of increased workload with the user fee exemption. There is need for balance in demand and supply aspects of the policy for sustainability, and desired outcome (Carasso et al., 2012). Similarly, Bohren et al. (2014) found that user fee exemption policies increased facility delivery, decreased maternal mortality ratio, and perinatal mortality rates. Among other things, distance to the facility, resource availability, quality perception, and socio-cultural influences were identified as barriers that should be looked at to augment the impact of the user fee policy (Bohren et al., 2014). A study conducted in Burkina Faso concluded that regardless of the type of user fee exemption policy, women did incur additional expenses at the facility (Ben Ameer, Ridde, Bado, Ingabire, & Queuille, 2012). This serves as a hidden financial bottleneck that barred access and negatively affected household economy (Ameer et al.,

2012).

The observed decrease in maternal deaths and improved pregnancy outcomes were linked to the improved access to MHS, largely due to the increase in the number of skilled staff providing MHS (WHO, 2005). This improved access to MHS, in terms of ANC and post-natal care, occasioned by increases in the number of skilled health care workers in developing countries resulted in the decrease in maternal death from 543,000 in 1998 to 287,000 in 2010 (WHO, 2013b). Furthermore, it directed national governments' efforts to collaborate with partners in developing countries toward improving women's status, in terms of education, employment, and reproductive choices. This was another factor responsible for the recorded achievements in MMR following the Beijing conference in 1994 and the Millennium Development Goals in 2000 (UNICEF, 2012). Mixed results regarding outcome of free health care policy further strengthen my resolve to find the real impact of free maternal and child health services on utilization, measured by antenatal visits in Jigawa State Nigeria.

Antenatal Care

The whole essence of ANC is to promote healthy pregnancy and ensure that safe child birth is the outcome of any pregnancy, while maintaining the health of mother (Ekabua et al., 2011). According to Ekabua et al. (2011), the major goals of ANC include:

- Maintaining the overall health as defined by the World Health Organization (state of complete physical, social, and mental wellbeing) of the mother and the unborn baby.

- Early detection and management of complications.
- Working out a parturition and complication plan.
- Preparing the mother for breast-feeding, sound puerperium, and the overall health and wellbeing of the child.

In the 1950s and 60s, Lawson and Stewart started maternal and child health services in Nigeria, but this effort was slowed in the 1990s, as a result of the economic downturn pushing people to traditional and spiritual options (Fagbamigbe & Idemudia, 2015b).

ANC is measured by three tenets; the number of visits, timeliness of service, and components (Joshi, Torvaldsen, Hodgson, & Hayen, 2014). Focused antenatal care components include, detection and treatment of obstetric complications like pre-eclampsia, tetanus toxoid immunization, intermittent preventive treatment of malaria during pregnancy, insecticide treated bed nets, iron and folic acid supplementation to prevent anemia in pregnancy, early detection and treatment of infections like HIV, hepatitis, syphilis and other sexually transmitted diseases, mental health problems, and related stress as well as domestic violence (Lincetto et al., 2013). Other important aspects of the ANC components are, skilled birth attendant, good behavioral practice, like breast feeding, and family planning (Lincetto et al., 2013). The World Health Organization made four ANC visits the standard. A significant proportion of women do not go for ANC, and among those who do, not all make the recommended four visits. According to the World Health Organization report from 2005 – 2012, the percentage of pregnant women with single ANC visit was 81%, and only 55% completed the mandatory four visits (WHO, 2013b). The Americas and European regions have attained 90% and 84%

respectively, of pregnant women attending four ANC visits. African and the east Mediterranean regions have a record that falls below 50%. The World Health Statistics Analytic Review from 2006 to 2013 on ANC revealed an indirect relationship between ANC and maternal mortality rate. The analysis showed countries with higher ANC coverage have lower MMR (Fagbamigbe & Idemudia, 2015a). United Arab Emirates had 100% ANC coverage and a MMR of 8 in 100,000 live births, Ukraine had 98% ANC coverage with MMR of 23 in 100,000 live births (Fagbamigbe & Idemudia, 2015a). By way of comparison, similar patterns can be seen in Sub-Saharan Africa. Ghana had 96% ANC coverage and 380/100,000 MMR, Chad had 43% ANC coverage and 980/100,000 MMR, and Nigeria had 61% ANC coverage with 560/100,000 MMR (Fagbamigbe & Idemudia, 2015a). Nigeria's MMR was above both African and Global values of 500/100,000 live births and 210/100,000 live births respectively (Fagbamigbe & Idemudia, 2015a). ANC utilization in Nigeria may be linked to the poor maternal health outcome, even though information on quality of ANC may not be provided by coverage (Fagbamigbe & Idemudia, 2015a). Studies have shown varying degrees of compliance with the required number of visits prescribed by the WHO and UNICEF, largely due to late booking by pregnant mothers. A study conducted in Nigeria in one of the tertiary health facilities in Niger Delta have shown that many pregnant women booked late for ANC (Ebeigbe, Ndidi, Igberase, & Oseremen, 2010). The study further revealed that 73.6% of the study participants booked in the second trimester, 26.4% in the third trimester, and 80% of those who had babies before booked late in one of their pregnancies (Ebeigbe et al., 2010). A large proportion (65.6%) of those who booked late

were ignorant of the preventive role ANC plays, and viewed it as curative service (Ebeigbe et al., 2010). This view is corroborated by another Nigerian study, where late ANC was evident (Ezugwu, Agu, Nwike, & Ezugwu, 2014; Wang et al., 2011). The results showed 25% booked in the first trimester, 64% in the second trimester, and 11% booked in the third trimester. This showed that over 70% of pregnant women booked late. Late booking for ANC denies many pregnant women the opportunity for early detection and treatment of pregnancy related conditions, which may be the reason for high maternal mortality in Nigeria (Wang et al., 2011). In another study in Tanzania, Gross, Alba, Glass, Schellenberg, and Obrist (2012) reported similar findings with Ebeigbe et al. (2010) where the practice denied them full benefits of ANC in terms of preventive, curative, and access to skilled birth attendant at the time delivery. Tribal affiliation, poor support from spouses, perceived poor ANC quality, and late recognition of pregnancy were linked to the late booking practice in the Tanzanian study (Gross et al., 2012). To reveal the reasons behind late timing of ANC visits, a study was conducted in Kigali, Rwanda (Hagey, Rulisa, & Pérez-Escamilla, 2014). Those findings were in agreement with Gross et al. (2012) on the role of spouses and the quality of ANC. A study conducted in Uganda also showed a lower proportion of pregnant mothers registering for ANC in the first trimester (Bbaale, 2011). That study showed that only 17 % booked in the first trimester of pregnancy, and only 47% participated in the mandatory four ANC visits. In contrast to most studies in Sub Saharan Africa on the four ANC visits, a study in Gabon showed a higher than average performance (Bouyou-Akotet, Mawili-Mboumba, & Kombila, 2013). The findings showed that 71.5% completed the required four ANC

visits, although 70% of the participants booked in the second trimester (Bouyou-Akotet et al., 2013). The first ANC visit should occur in the first trimester, and the last visit should be close to the delivery period, around 37 weeks to ensure adequate preparations for a safe delivery. In Nigeria, about half (51%) attained the mandatory four ANC visit, 36% delivered at the health facility, and only 38% of the births within five years preceding the NDHS were supervised by skilled birth attendants (Fagbamigbe & Idemudia, 2015a). The level of ANC utilization and deliveries assisted by skilled birth attendants was below many African countries, since 71% of pregnant women in Africa attended at least one ANC, and 48% of the deliveries were assisted by skilled birth attendants (Fawole et al., 2012; Fagbamigbe & Idemudia, 2015a).

To derive the maximum benefit from the recommended four visits, the antenatal care must have the required components (Lincetto, Mothebesoane-anoh, Gomez, & Munjanja, 2013) as noted earlier. In Nigeria midwives, nurses, and doctors are saddled with the responsibility of providing ANC services. It is important to mention that vibrant ANC depends on capable health care workers within a functional health system that is equipped with referral and laboratory services. Focused ANC studied was for uncomplicated pregnancies, but in cases where there were complications, ANC visits should occur more than four times, and possibility of referral should be made (Bbaale, 2011). In Nigeria, Ifenne and Utoo (2012) showed that for each pregnant woman attending ANC, the staff spent about 40 minutes on the first visit, and 30 minutes on subsequent visits. A study in Tanzania supported this findings (Lincetto et al., 2013). The authors showed that between 46 and 36 minutes were spent on the first and successive

ANC visits respectively (Lincetto et al., 2013).

Lincetto et al. (2013) demonstrated that quality ANC directly reduces the number of stillbirths and neonatal deaths. The result showed that 14% of neonatal deaths would be averted in Africa if 90% of pregnant women attended ANC (Lincetto et al., 2013). In another study in Tanzania, similar reduction was reported for women attending regular ANC (Zegeye, Bitew, & Koye, 2013). However, the authors in this study attributed this direct reduction of neonatal deaths only to quality ANC; all their components targeted patient satisfaction (Zegeye et al., 2013). ANC was found to reduce the number of death of pregnant mothers and their unborn children indirectly by ensuring healthy pregnancies and postnatal periods considered to be high risk by obstetricians (Lincetto et al., 2013). ANC serves as the first point of contact for pregnant women with health careprofessionals, and serves as an integrated care point where promotive, preventive, curative, and healthy behavioral services are offered (Zegeye et al., 2013).

In Nigeria, the National Aid and Reproductive Household Survey (NARHS) conducted in 2012, and the National Demographic Health Survey (NDHS) conducted in 2013 showed that 34.9% and 33.9% of pregnant women did not attend ANC respectively (Fagbamigbe & Idemudia, 2015a). Among women of child bearing age (15 to 49 years) who had live births five years preceding the NDHS survey, only 60.9% were supervised by skilled birth attendants; doctors, nurses, midwives, or auxiliary nurses (Fagbamigbe & Idemudia, 2015a). In comparison, Mali, a neighboring West African Country, women participated in 57% of four ANC visit five years preceding the survey in 2001, and Indonesia, had 66% of pregnant women attending four ANC visits five years before the

survey in 2007 (Fagbamigbe & Idemudia, 2015a). Nigeria did not attain the ANC success recorded by Mali over ten years ago, and Indonesia recorded five years ago (Fagbamigbe & Idemudia, 2015a). Many reasons were advanced for why pregnant women in Nigeria were not attending ANC. An inability to pay for services, distance from the health facility, education, income/employment, parity, and urban/rural settings were major factors responsible for the low usage of ANC services (Hagey et al., 2014).

Economic and political developments also impacted the level of utilization of ANC services across regions within countries in Africa. This was demonstrated in a study conducted in Nigeria, Kenya, and Tanzania, where the levels of utilization were higher in urban than rural settings; probably due to the misdistribution of health facilities favoring the urban regions (Tey & Lai, 2013). The ratios of urban to rural utilization of ANC services in Nigeria, Kenya, Niger, Uganda, Ghana and Tanzania were 70.7%, 8.3%, 88.6%, 21.2%, 72.1%, and 22.1% respectively (Tey & Lai, 2013). Similar findings were reported in a study in southwestern Nigeria, where urban dwellers were twice as likely to use ANC services than rural dwellers (Daira & Owoyokun, 2010). Using the 2008 Demographic Health Survey, a study was done in Nigeria to look at the differences between rural and urban utilization of ANC services (B. I. Babalola, 2014). Rural pregnant women were less likely to use ANC services than their urban counterparts as shown by logistic regression analysis; O. R = 0.53, C. I = 0.48 – 0.59 (B. I. Babalola, 2014). Disparities in utilization of ANC services were evident across the six geo-political zones (north central, northwest, northeast, southwest, southeast, and south). Pregnant women in the southern region were three times more likely to use ANC services than

their counterparts in the northwest and northeastern regions.

Mothers' education and ANC use. Women's education is all encompassing, and covers general education, technical, vocational, health, professional education and more. It aims at improving and enhancing the knowledge and skills of women and girls. The skills of writing, reading and effectively getting along, or communicating, position women strategically in our communities (UNESCO, 2010). Education, according to women, is the opportunity to step forward and contribute meaningfully to the economic development of their societies, and equally gives them the opportunity to be free from over-dependence on men economically. Education opens doors for employment opportunities that afford women financial independence and a degree of autonomy to make important decisions on the utilization of ANC services, family planning. It is pertinent to mention that primary school education is a fundamental right that needs to be supported by all countries globally, and should not be seen as a privilege. Women's education has a profound positive impact on violence, and other forms of injustice against women like forced prostitution, female circumcision, and child marriage (UNESCO, 2010). Women's education brings honor, dignity, justice, socio-economic and political independence, and a voice.

According to the WHO's pooled data spanning from 2005 to 2010, the global literacy level stands at 84%, with WHO regional figures noted at 70%, 69%, and 63% for South East Asia, Eastern Mediterranean, and Africa respectively (WHO, 2013a). About 153 million adults in Africa, representing 38% of the total population, are illiterate, and 2/3 of them are women (UNESCO, 2013). Zimbabwe has the highest literacy rate at

90.7%. Nigeria fared better than its West African neighbors with a literacy rate of 68% (UNESCO, 2013). Burkina Faso, Gambia, Guinea-Bissau, Senegal, Mali, Ghana, Benin, and Niger have less than a 50% literacy rate (UNESCO, 2013). According to the National Population Commission, the female literacy rate stands at 61%, with remarkable geopolitical differences within the country. The northwest and northeast part of the country have less than 20% female literacy level (National Population Commission, 2009). Education is linked to employment, and by extension, women's incomes and social status. It also impacts their reproductive health choices, and their use of ANC services after controlling for other covariates (Ahmed et al., 2010; Fawole et al., 2012; Wang et al., 2011). Generally, education not only helps with reproductive decisions, but helps women to gain respect from family members, including spouses and other community members (Gharoro & Igbafe, 2000). Furthermore, education improves self-confidence, a necessary component for informed decisions regarding women's health and that of their families (Abosse, Woldie, & Ololo, 2010). Many studies have demonstrated the role of illiteracy on poor pregnancy outcomes (Olanrewaju, 2013; Orye et al., 2013; & Wang et al., 2011). Educated women decide on the number of children they will have, and the method of birth control they will adopt in the spirit of health promotion, which reduced death resulting from pregnancy complications (Awusi, Anyanwu, & Okeleke, 2009). Education reduced the lifetime risk of women dying from pregnancy and its attendant complications (UNICEF, 2012; & WHO, 2010).

A cross-sectional study conducted in Ethiopia, where only three out of ten pregnant women attended ANC, education was found to be the major predictor of ANC

usage (Abosse et al., 2010). The study showed that 69% of women attending ANC services in the southern region were educated, and the remaining 31% did not have any form of western education (Abosse et al., 2010). Another survey done between January and February 2012 among women who attended ANC three years preceding the survey in Central Ethiopia showed that education was the major determinant of ANC use among the women studied (Birmeta, Dibaba, & Woldeyohannes, 2013).

Similarly, a descriptive cross-sectional study done in southwestern Nigeria to ascertain the factors responsible for early booking, singled out education as the main factor responsible for early booking of ANC services in that region (Adeyemi et al., 2007). The study results showed 60% of the women utilizing the MCH services had secondary and tertiary education (Adeyemi et al., 2007). In Ghana, a study was done to assess the quality of the ANC services delivered (Atinga & Baku, 2013). The authors demonstrated that the odds of reporting good ANC quality was high in those pregnant mothers with junior and higher levels of education (Atinga & Baku, 2013). To uncover the link between ANC quality and the education of pregnant women mediated by the number of ANC visits, a study was conducted to demonstrate the link using demographic health surveys in Kenya, Malawi, and Nigeria (B. I. Babalola, 2014). The findings showed that a significant proportion of the effect of education on the quality of ANC is direct (S. Babalola, 2014). A study was conducted in a rural community in Nigeria to look into factors responsible for ANC use (Awusi et al., 2009). Of the total population studied, 57% attend ANC and 43% did not, and those that attended ANC services included 69% had attained secondary education, 96% had tertiary education, 69% had

husbands with a secondary education, and 82% had husband with tertiary education (Awusi et al., 2009).

Many studies have demonstrated that secondary and post-secondary education are linked to increased utilization of ANC services, facility delivery, and child spacing and family planning methods in developing countries like Nigeria (Ahmed et al., 2010; Atinga & Baku, 2013; B. I. Babalola, 2014; Fawole et al., 2012). However, there was no agreement among researchers and the scientific community at large, on the mechanisms which impacted the health seeking behavior of pregnant mothers translated through ANC visits and institutional delivery. Cleland and Van Ginneken (1998) postulated that ANC visits were a result of a high level of income/wealth through employment guaranteed by education.

Research was conducted in southwestern Nigeria on the utilization of ANC services (Iyaniwura & Yusuf, 2009). The study used 392 pregnant women, their pattern of ANC use, and the factors responsible for use of maternal health services as measured by ANC use. The study revealed that the usage of ANC increased with increasing levels of education and levels of income in the area studied (Iyaniwura & Yusuf, 2009). This implied that women with educational levels higher than secondary school certificates used antenatal care services more as compared to those with lower educational levels. The better the socio-economic standing of pregnant women in the community, the more the use of ANC services (B. I. Babalola, 2014).

Another study was conducted by Kabir et al. (2005), in northern Nigeria, on factors associated with the use of ANC services. The descriptive study used 200 women

of childbearing age in Kumbotso , Kano. The authors found that 59% of the women used antenatal care, and 41% did not (Kabir et al., 2005). The authors further found that the use of antenatal care services was positively linked to women's education and that of their spouses. Women with tertiary educations used antenatal care services more than those with primary and secondary educations (Kabir et al., 2005). The findings further buttressed the importance of education on the use of ANC services.

Elo (1992) suggested that place of domicile coupled with family/community social structures were responsible for ANC use. Contrary opinions were advanced by S. Babalola (2014), where it was shown that educated pregnant women attend ANC more than their uneducated counterparts irrespective of place of domicile (urban or rural). Having said this, there was evidences in the literature that showed education was not a guarantee to increased use of ANC services (Sharp, Ross & Cockerharn , 1983). To buttress this point, Sharp, Ross & Cockerharn documented that educated women engaged in self-treatment and failed to make follow up or recommended visits compared to their uneducated peers with the same incomes living in the same community (Sharp, Ross & Cockerharn , 1983). It suffices to say that utilization of ANC services is a product of many factors.

Employment and use of ANC. Women in Nigeria constitute about half of the Nigerian population, and by extension, half of its workforce. They are engaged in work that men do, or do far more. However, the type of work and the condition under which they do the work differ greatly with that of men, and this includes opportunities for advancement (ILO, 2009). Women are denied equal opportunities for employment

compared to their male counterparts, and often times opt not to work due to pressing family issues. Thus, the removal of any barrier that guarantees equal opportunities in employment for women is a right step towards advancing women's position in the global socio-economic sphere. The Beijing Declaration affirms the national resolve on the rights, advancement, and empowerment of women and girls in all areas of human development, including the economic sphere (UNESCAP, 2010). The Beijing platform for action recognizes the importance of women in the economy, and thus calls out the need for them to receive equal employment opportunities and resources. In addition, the provision of employment for all is part of MDG 1 for eradicating extreme poverty and hunger. According to the National Bureau for Statistics (NBS), the national labor participation rate for women between the ages of 15 and 64 is 64.5% compared to men's rate of 70.3%. Most state civil service work force was dominated by men, with exception of few states, like Rivers, Delta, Lagos, Abia, Gombe, Taraba, Oyo, Ogun, and Benue (NBS, 2013). Jigawa State was among the states in the country with the lowest number of employed women (NBS, 2013).

A cross-sectional quantitative study was conducted in Ekiti, Nigeria, where eighteen primary health centers were randomly selected, including rural and urban primary health centers to ascertain factors responsible for early ANC booking (Ajayi & Osakinle, 2013). The study noted that the employment status of the participants included; 51.2% with skilled occupations, 26% with unskilled occupations, and 22% were not employed (Ajayi & Osakinle, 2013). According to the authors, unskilled workers were 1.8 times less likely to book in the first trimester as compared to the unemployed (OR =

0.6, 95% CI = 0.31 – 0.98), in the same vein, skilled workers were 2.6 times less likely to book in the first trimester compared to the unemployed (OR = 0.39, 95% CI = 0.23 – 0.66). Similarly, another cross-sectional study was conducted in Delta, Nigeria to determine the factors responsible for utilization of ANC services (Awusi et al., 2009). The findings showed that 100% of civil servants, 75% of traders, and 48% of farmers used ANC services, but only 36% of housewives, in other words unemployed, utilized ANC services (Awusi et al., 2009).

S. Babalola (2014) completed a study on the factors responsible for differences in utilization of ANC services among rural and urban dwellers. The study used the 2008 Nigerian Demographic Health Survey to look at socio-demographic factors responsible for ANC uptake in rural and urban residents. The result showed that employed rural women were 1.22 more likely to use ANC services as compared to unemployed rural women (B. I. Babalola, 2014). An Ethiopian study was conducted to determine the factors responsible for non-usage of maternal health services (Fekede & Mariam, 2007). That study was conducted between January and February 2006. The result showed those engaged in farming were four times more likely to use maternal health services than those not engaged in any form of employment (OR = 2.74, 95% CI = 1.37 – 4.38). However, not all the studies concurred with their being a direct relationship with employment. Fagbamigbe and Idemudia (2015b) found that 96% of non-users of ANC services were those employed.

Employment was linked to women's autonomy in their health and that of their children in many communities across Sub-Saharan Africa. Bako et al. (2012) found that

women in Sub-Saharan Africa lacked the autonomy to make informed decisions regarding their health and that of their children, but rather, depended on their spouses, relatives, and friends. Doing so brought about delay in accessing maternal and child health care that resulted in maternal and child deaths. Employment also afforded women the choice of where to go for delivery at the end of their antenatal care (Fotso, Eze & Essendi, 2009). Although employment was critical in accessing care, spousal, community, and family factors played an important role for pregnant women in accessing such care (Stephenson et al., 2009).

To some, autonomy has to do with empowerment (Ahmed et al., 2010; Ibrahim & Akhire, 2007; Mason & Smith, 2003), to others it has to do with independent decision making (Aowitz et al., 2002), and to many, it touches on volitional control (Burchardt, Evans & Holder, 2010). Autonomy under the sphere of maternal health, was the ability of a woman to make an informed choice regarding their reproductive health (Burchardt et al., 2010). Therefore, autonomy was about whether to be pregnant, when to be pregnant, the number of children to have, where and when to go for ANC, natal, and post-natal care, including family planning or child spacing. It may mean making decisions and taking actions that may be in conflict with those close to them (Mason & Smith, 2003). Due to the divergent definitions of the word autonomy, it becomes practically impossible to make comparisons between different regions. All the same, it is a result of the interaction between socio-economic, political, religious, and cultural factors that directs the behavior of an individual in different communities.

Autonomy was measured indirectly by social scientist by assessing educational

level, employment status, age at first cohabitation, age difference between women and their partners, owning landed properties and ornaments, living with in laws in same house, children enrollment in school, cooking, and seeking permission before going out (Amowitz et al., 2002; Bloom et al., 2001; Cook & Dickson, 2002; Mason, 1986). These variables define the environment where the women were born, grow, work, or got married, and was what influenced how they thought, acted, and behaved, not only regarding reproductive choices, but in all aspect of their lives. It is on record that behaviors adopted as a result of these interactions within our social environment have a profound impact on individual health and that of the family.

My focus on autonomy dwells more on socio-economic variables that allow women to go for ANC visits, deliver at health facilities under the supervision of skilled birth attendant, and utilize post-natal services including family planning. Many studies showed that women have diminished autonomy in personal and household matters. However, socio-economic standing was shown to have synergistic effect, or rather direct influence on female autonomy as it affects reproductive choices (Babalola & Fatusi, 2009; Olarenawaju, 2013; Shah, Din & Ali, 2012; Montagu et al., 2011; Mumtaz, Salway, Shanna, Zaman & Laing, 2012).

Lack of autonomy has a negative impact on the mother and the unborn child, and mostly lead to maternal and neonatal death as a result of delay in accessing care. The lack of autonomy can cause any, or all the three delays identified in the 3D model. The 3 D model advocated timely action for all the three stages in the intervention pathway that to reduce maternal morbidity and mortality during pregnancy, labor, and puerperium

(Thaddeus & Maine, 1994). The three stages are: a) delay in making the decision to seek care, b) delay in reaching a health facility providing MHS, c) delay between reaching the facility and commencement of obstetric care.

Family, socio-economic level, and recognition of danger signs and symptoms all play a role in decision making to seek medical care (Acharya, Bell, Simkhada, Van Teijlingem & Rengem, 2010; Belton, Myers & Ngana, 2014; Magoma et al, 2010; Thaddeus & Maine, 1994). The abilities of traditional birth attendants operating in the community to refer or recognize danger signs greatly helped in not ignoring the severity of problems, as observed in many parts of Africa (Ebuehi & Akintujoje, 2012; Essendi, Mills, & Fotso, 2011; Ghebrehiwet & Morrow, 2007; Jammeh et al., 2011; Thorsen et al., 2012). The common feature in these studies is the limited autonomy of women, irrespective of educational and employment status, that suggested the possible role of cultural and religious factors. For example, in Pakistan and India (Senatra & Gunawerdena, 2009), and in Nepal (Acharya et al., 2012), elderly women, in-laws, and women with many children were allowed to make decisions on household and reproductive issues compared to younger mothers and those with fewer children than three. This suggests that women with autonomy and power in the family may use ANC services more than those with limited power or autonomy within the family setting (Beegle, Frankenbers & Thomas, 2001). However, this is in contrast to the findings in Kenya (Fatso et al., 2009; Fatso, Eze & Oronje, 2008), and Nepal (Fatura & Sanway, 2006) where women's autonomy was defined by financial independence, free movement, independent decision making had no impact on usage of MHS as measured by ANC.

A study conducted in Pakistan that cut across different social strata found that the freedom of going out of the matrimonial home did not translate to women's autonomy because it was permissible for women to go out to the fields and visit relatives frequently (Mumtaz & Salway, 2009). This finding was in sharp contrast to a study in kano, where women had to have permission to go out of either their family home or to the hospital (Adamu & Salihu, 2002). This indicated that use of freedom of movement as proxy for women's autonomy varied greatly due to cultural and religious differences regarding the position of women in society, even when it came to pregnancy and childbirth.

After passing the first hurdle with regard to permission to go out, a second form of delay arose before a pregnant woman could go to the facility for ANC. This may be due to distance, bad terrain, lack of transportation, and lack of transport fare (Belton et al., 2014; Essendi et al., 2011; Ghebrihiwet & Morrow, 2006, Jammeh et al, 2011; Thorsen et al., 2012). These barriers dictated how early a woman in rural area accessed obstetric care. Even after controlling for socio-economic status, women in rural areas faced a high risk of maternal death and morbidity as compared to their urban counterparts. This was as a result of terrain (mountains, swampy area, and lack of access roads), lack of a functional public transport system, and in some instances, families who needed to use animals for transportation which increased the transportation time, and invariably increased the risk of death (Nour, 2008, Ramos, Karolinski, Romero & Mercer, 2007). Another reason for the second delay was the lack of ambulance services, telephone, health workers, or skilled birth attendants to make referrals to other health facilities (Belton et al, 2014). In Jigawa State, the Ministry for Women's Affairs provides

motor vehicles for transporting women in labor to reduce the problems faced by such women.

Delays in starting obstetric management may be in the form of long waiting times for pregnant woman to be seen by health worker (Umar, Ocheh & Umar, 2011), misdiagnosis (Ramos et al., 2007), and out of stock blood products, pharmacy supplies, and surgical packages (Garba & Umar, 2013; Ramos et al., 2007). There were instances where cases were referred to another hospital, and this would further increase the delay that, in turn, increased the likelihood of maternal and fetal death as was observed in Sokoto, Nigeria (Garba & Umar, 2013).

Knight et al. (2013) reviewed 32 articles on pregnant women receiving treatment after reaching the hospital. The most common problem seen was the lack of skilled health workers, emergency obstetric drugs, diagnostic technology like ultrasound, and demotivated staff due to work overload and lack of incentives. This resulted in poor quality of care in most facilities in the developing world as observed in Tanzania where less than 50% of women who delivered in health facilities, and those that had post-partum hemorrhage were given oxytocin (Magoma et al., 2010; Nelissen et al., 2013) which was in conflict with WHO recommendations regarding post-partum hemorrhage management (WHO, 2007).

Cultural health capital was a factor responsible for the third delay. It comprises cultural skills, friendliness, verbal and nonverbal skills, and levels of confidence deployed to receive favorable responses from the health care providers (Shim, 2010). Patient/client and provider relationships are based on knowledge, belief, attitude,

behavior, and practice regarding specific disease conditions. Literacy equipped a woman with the ability to communicate effectively with health care providers to access care easily (Acharya et al., 2010).

Although these three stages of delay were interconnected, they all stood on their own independently. It was documented that the relationship between autonomy and use of ANC was not same across regions and cultures. For instance, in Pakistan the use of ANC was not a pointer to women's autonomy because of their lack of control on household income, and their freedom to go outside of their homes was tolerated in large scale (Mumtaz & Salway, 2009) and this is same in Somalia (Ghebrehewet & Morrow, 2007). All the same, many studies showed that women from rural areas, brides, polygamous linkages, nulliparous, and those with few children faced all kinds of delays, and were less autonomous. Therefore, specific interventions should be directed along the delay pathways to allow pregnant women access to ANC, as done in Jigawa State with *haihuwa lafiya*, meaning safe pregnancy and delivery.

Kabir et al. (2005) showed a positive association between employment and the use of antenatal care services. The authors revealed that 95% of those employed used antenatal care services as compared to full-time housewives whose utilization was 33% (Kabir et al., 2005). Fawole et al. (2012) agreed with Kabir et al. (2005), where over 80% of those employed used antenatal services. Employment in women was central when it came to autonomy and a voice in using ANC services in the developing world.

Parity and use of ANC. Studies conducted globally showed a strong association between parity, fertility rates, and the use of antenatal care services. While the fertility

rate of Africa is 4.8%, that of high-income nations remained at 1.8%, and this difference explained the low position accorded to women in Africa, and cultural differences responsible for such behavior (WHO, 2013a). It is important to note, inter and intra country differences between countries in Africa, Asia, and the Americas. In Africa for example, Niger Republic has the highest fertility rate of 7%, closely followed by Somalia and Zambia at 6.3%, Mali at 6.2%, Uganda at 6.1%, and Nigeria at 5.5% (Umar, 2016). Although the national fertility rate was 5.5%, it was not surprising to see women in both urban and rural areas with 10 or more children; culture, religion, region, and ethnicity notwithstanding (Umar, 2016).

In general, the health seeking behavior of young and older women differed greatly. While the young were more exposed to modern and current health care approaches due to a higher level of education, the older women had more experience with pregnancies and childbirth, and tended to be more confident (Navaneetham & Dharmaligam, 2002). In other words, primigravidas tended to place more importance on their first pregnancy through maternal health service utilization than multigravidas.

Close to one quarter of all deliveries in the developing world were among teenagers who were reported to have a fertility rate of 192 per 1000 girls (WHO, 2013b). This was in contrast to most developing countries where the fertility rate was 10 per 1000 girls, with exception of the UK and the US with 25 and 39 per 1000 respectively (WHO, 2013b). These findings further demonstrated the higher risk of death that teenagers face during pregnancy, labor, and puerperium. Interestingly, this trend is changing across many developing countries including Nigeria, where studies on risks of maternal neonatal

death have shown no statistical difference between teenagers and other age groups (Fawole, 2012). However, this finding must be treated with caution because it is hospital based, and the tendency for selection bias would be there due to the fees charged. It is important to note that the study site did not offer free ANC services, as such, less privileged pregnant women would not enjoy the services rendered in such an institution. In Nigeria like in India, women usually go to their parents to manage the first pregnancy until delivery. Consequently, the parents ensured proper and adequate ANC visits as well as facility delivery (Idris & Sambo, 2012).

Women with five pregnancies or more have a higher risk of maternal death because of complications associated with pregnancies in this stage. Studies across the globe demonstrated that obstetric performance of multiparous women was poor compared to women with five or fewer pregnancies (Ory & Van Poppel, 2013; Umar, 2016; Yego et al., 2014). For instance, in the United States, women with five or more pregnancies had a nine-fold increase in obstetric complications as compared to those with fewer pregnancies (Rochat, 1991). The study further found that the higher the parity of the woman the more use of ANC (Rochat, 1991). Fawole et al. (2012) findings were similar to Rochat (1991).

In Bangladesh, multiparous women had a twofold increase in ANC usage as compared to women with parity in the range of 1 – 4 after controlling for cofounders (Chen et al., 1979). In Nigeria, a threefold increase of ANC use for multiparous women as compared to those with a parity range of 1 – 4 was demonstrated through a quantitative study using ANC records in 10 hospitals in northern Nigeria (Idris & Sambo, 2013).

There was strong association between parity and use of ANC services. Studies in Nigeria (Adeyemi et al., 2007; Dahiru & Oche, 2015; Fawole et al., 2012), Ethiopia (Birmeta et al., 2013) and Zambia (Chama-Chiliba & Koch, 2015) all showed strong associations between parity and the use of ANC services. However, some authors showed a negative association (Dairo & Owoyokun, 2010; Fekede & Mariam, 2007; Gharoro & Igbafe, 2000).

In a cross-sectional study in Kassala, in Sudan, 900 women were used for a study to assess the factors responsible for antenatal usage in the district (Ali et al., 2008). The authors found that those women with high parity used less antenatal care services in the district, with logistic regression (OR =2.0, CI = 1.1 – 3.5; P = 0.01) showing high parity associated with inadequacy of ANC use. Similarly, low usage of antenatal services was associated with parity in a different study in east Africa (Ali et al., 2008). The authors found that multiparous women used less ANC services as result of prior experiences with previous pregnancies, poor socio-economic standing, and illiteracy (Simkhada, Teijlingen & Simkhada, 2008).

A quantitative study was conducted in Ghana in 2008, three years post implementation of the free maternal and child health policy in the country (Arthur, 2012). The findings buttressed the important role socio-economic status had on the use of antenatal care alongside parity of the women. The author found that the higher the number of pregnancies the better the use of antenatal care in all the respondents that took part in the study. Similarly, Ansariadi and Manderson (2015) agreed with the position of Arthur (2012). It was found that parity played a significant role on the usage of ANC.

The authors further demonstrated that multiparous women used antenatal services four times more than nulliparous women (Ansariadi & Manderson, 2015).

Summary and Conclusions

The literature review examined the current knowledge of health care utilization under user fee free policy, and the influence of education, employment, and parity. The review identified a gap in the literature regarding the role JSFMCHP played in utilization of health care services measured by the number of ANC visits from 2011 through 2015. The main sections of the chapter were: a) introduction, b) the literature search strategy, c) the Jigawa state background, d) literature review related to key variables (health care financing, education, employment, and parity). In Chapter 3, I presented the research method in detail.

Chapter 3: Research Method

Introduction

The intent of this study was to examine the utilization of maternal and child health services as measured by the number of ANC visits across 5 years, spanning from 2011 to 2015 in Jigawa State. Several studies have demonstrated how user fee exemption policies in the developing world led to increased utilization of services (Bohren et al., 2014; Da Costa et al., 2013; Hatt, Makinen, Madhavan, & Conlon, 2013; Melaku et al., 2014; Gilson & Schneider, 2006) and quality of maternal services (Basinga et al., 2011; Bassani et al., 2013; Morgan et al., 2013; Philibert, Ridde, Bado, & Fournier, 2014; Ridde, Robert, & Meessen, 2012). Based on my review of the literature, researchers had not yet evaluated the impact of the JSFMCHP since its inception. I conducted this study in order to address this gap in the literature.

This chapter includes the detailed steps I followed to conduct the study. I provide details on the study design and approach, study site and population size, sampling method, data collection and analysis procedures, ways of ensuring data protection and privacy of participants, and plans for the dissemination of study findings. The chapter concludes with a summary of important points.

Research Design and Rationale

This study was a cross-sectional survey of HMIS data from 2011 to 2015. The four independent (predictor) variables were JSFMCHP, education, employment, and parity while the dependent (outcome) variable was the number of antenatal visits. The aim was to find out whether the independent variables (in isolation or jointly) were

statistically related to the dependent variable, antenatal visits. The hypothetical link between the five constructs is shown in Figure 4.

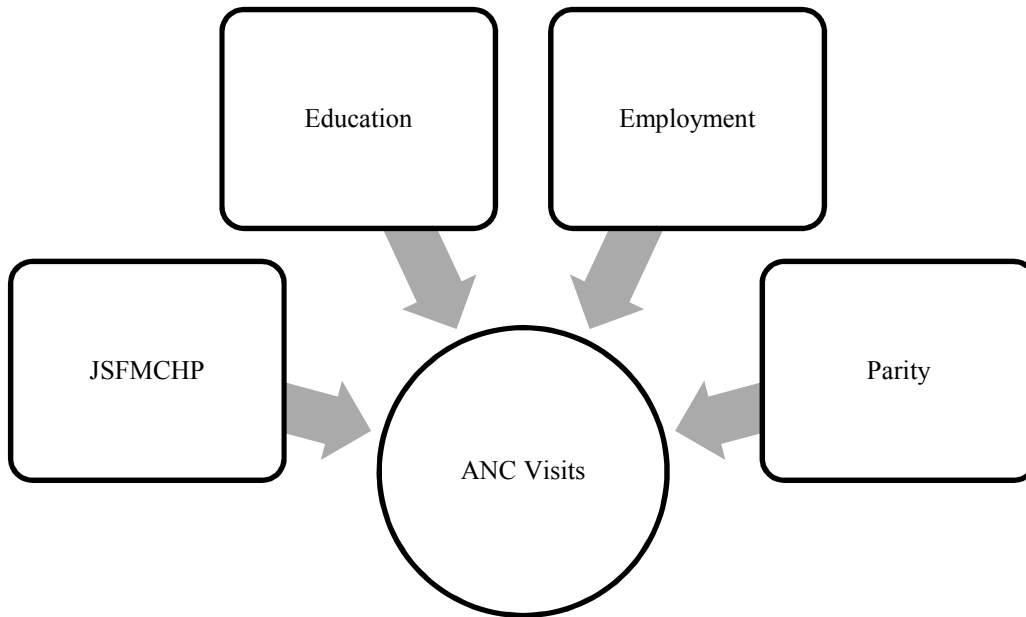


Figure 4. Model depicting the association between independent variables and dependent variable.

Table 2 shows the definitions and categorization of these constructs as they were used in the study.

Table 2

Definition and Categorization of Variables Used in the Study

Variable type	Variable description	Category
Dependent variable		
ANC visits	Number of ANC visits during pregnancy	0 = one to three visits 1 = four or more visits
Independent variables		
JFSMCHP	Jigawa State Free Maternal and Child Health Program	0 = participation in the program 1 = non-participation in the program
Education	Level of educational attainment of pregnant mothers in the study	0 = no formal education 1 = primary education 2 = secondary education 3 = tertiary education
Employment	Working status of pregnant women	0 = not employed 1 = employed
Parity	Number of times woman has been pregnant	0 = first pregnancy 1 = two to four pregnancies 2 = five or more pregnancies

I used secondary data for the study for many reasons. The antenatal record of all pregnant mothers attending hospitals offering the free maternal and child health program are recorded daily by the respective health facility records clerks. These records are summarized monthly by each health facility and sent to the planning and research department of the state ministry of health. The monitoring and evaluation unit under the planning department of the state ministry summarizes the data for quarterly comparison, and also enters it alongside other health information in the HMIS data manually. The database contains many years of data on ANC utilization as well as other morbidity and

mortality information from all health facilities across the state that allows for annual comparison (MOH, 2010). Secondary data is more economical in terms of time and resources as compared to primary data, and it allows for past records to be reviewed and used in studies that otherwise would rely very much on individual recall (Boslaugh, 2007; Mccaston, 1998).

Methodology

Population

I selected Jigawa State as the focus for the study because it had a user fee policy for maternal and child health to a fee free policy, otherwise called JSFMCHP. There has been no attempt to evaluate the program since its inception (MOH, 2011). The target population for the study was pregnant women who attended 12 general hospitals and 10 primary health centers where free health care for pregnant women and children under the ages of 5 is offered. The inclusion criteria, therefore, were pregnant mothers attending ANC in those targeted hospitals between 2011 and 2015. The 5-year period included pregnant women who participated in the program or otherwise. Pregnant women attending private hospitals were not included because they pay for service. Also excluded were all other pregnant women using health institutions not covered by the program as well as those outside the period of the study.

Sampling and Sampling Procedures

At first, the alpha level, or level of precision, was set at 0.05 in order to have a 5% chance of having a Type 1 error (rejecting the null hypotheses when it is true), and the statistical power at 95%. This means that one can expect an association between the

independent variables and number of ANC visits 95% of the time, and not by chance. I adopted Maxwell's (2000) approach to arriving at a sufficient sample size but increased the sample size to 400 to increase the influence of my study. This increase in sample size conferred a higher degree of representativeness of the population attributes from which the sample was drawn (see Van Voorhis & Morgan, 2007). Accordingly, I used 400 as my sample size to increase the generalizability of my study. I used the Statistical Package for Social Science (SPSS) for analysis.

Procedures for Recruitment, Participation, and Data Collection

To access the secondary data of ANC visits in the state that contained information on other variables of interest (employment status, educational level, and parity) that spanned from 2011 to 2015, I approached the custodian of the data, the Department of Planning Research and Statistics of the State Ministry. After writing formally about my desire to access the data contained in the HMIS, the permanent Secretary of the Ministry granted permission for me to access the data. The Ministry of Health records clerk helped me draw a random sample of 400 ANC records from the HMIS data, which included bio, and socio-economic data and the number of ANC visits for each pregnant woman. I transferred the information to a spreadsheet document and later to SPSS for analysis. My aim was to assess the utilization of maternal and child health services measured by ANC visits in the state, bearing in mind the four independent variables across 5 years. I sought and obtained Institutional Review Board (IRB) approval on November 06, 2017 (IRB approval number 10-06-17-0301339), prior to data usage.

Data analysis plan. I used SPSS to analyze the data and answer the research questions and hypotheses.

It is important to note the issue of missing data when dealing with secondary data. Although researchers try to avoid dealing with incomplete data, it sometimes happens for reasons beyond their control. Missing data above 5% will affect statistical authority, sample size, and study conclusions (Pigott, 2001). To find the percentage of missing data, I ran frequency on each variable, per Graham (2012).

Many researchers have used the following approaches to manage missing data during analysis: listwise deletion, pairwise deletion or advance case analysis, and mean (either grand mean for all participants in dataset for the variable, or group mean when one splits the dataset into groups to find the group mean). The last is the use of prior knowledge, or best educated guess based on experience. I used complete case analysis/listwise deletion where the missing data was above 5%.

RQ1: What is the association between JSFMCHP and the number of ANC visits?

H_0 1: There is no association between JSFMCHP and the number of ANC visits.

H_1 1: There is association between JSFMCHP and the number of ANC visits.

RQ2: What is the association between education of pregnant women in Jigawa state and the number of ANC visits?

H_0 2: There is no association between education of pregnant women in Jigawa state and the number of ANC visits.

*H*₁₂: There is association between education of pregnant women in Jigawa state and the number of ANC visits.

RQ3: What is the association between employment of pregnant women in Jigawa state and the number of ANC visits?

*H*₀₃: There is no association between employment of pregnant women in Jigawa state and the number of ANC visits.

*H*₁₃: There is association between employment of pregnant women in Jigawa state and the number of ANC visits.

RQ4: What is the association between parity of pregnant women in Jigawa state and the number of ANC visits?

*H*₀₄: There is no association between parity of pregnant women in Jigawa state and the number of ANC visits.

*H*₁₄: There is association between parity of pregnant women in Jigawa state and the number of ANC visits.

I conducted data analysis in three stages. The first stage was a descriptive analysis using 0.05 alpha levels to determine the frequency of ANC visits across the predictor variables from 2011 to 2015. The second stage involved a cross-tabulation to assess whether the independent variables are statistically related to the outcome variable at .05 significance levels. In interpreting chi-square, McDonald (2015) showed that SPSS uses a

degree of freedom, represented as one less the number of categories (df-1). It is important to note the value of Goodman and Kruskal's lambda; a value of 1 would indicate one variable predicts the other, and 0 indicates one variable do not predict the other (McDonald, 2015).

The third stage of data analysis determined whether an association exists between the predictor variables (JSFMCHP, education, employment, and parity) and ANC visits, using multiple logistic regressions. Utilization of maternal and child health services as measured by ANC visits was a binary variable, where 0 = one to three visits, and 1 = four or more visits. Logistic regression, as argued by Trochim and Donnelly (2011), found the best fitting model to describe the relationships between the dependent or outcome variable, and a set of independent/predictor variables. I ran a chi-square test to find the statistical relationship between each predictor variable and the dependent variable (ANC visits), followed by multiple logistic regressions to determine statistical relationship between the four independent variables (JSFMCHP, education, employment, and parity).

Instruments and materials. I used a cross-sectional descriptive design with archived secondary data contained in HMIS database for the study. This database contains information on all health services delivered across all health facilities in the state, including antenatal care utilization spanning a decade. The flow of the data originates from various health facilities on a daily basis using a standardized reporting document. All the information collected is summarized monthly and sent to the Ministry of Health (Planning, Research and Statistics Department) a week preceding the month of reporting (MOH, 2010). For example, January reports should be at the ministry by the

end of the first week of February. Specifically, the monitoring and evaluation officer enters all the information gathered monthly in the HMIS document, and develops a monthly state report.

Threats to Validity

Ethical Procedures

Secondary data contained in the HMIS database does not contained any personal information, and as such cannot be traced to any individual. Therefore, informed consent was not sought for the study. I obtained approval to access the HMIS database from the state Ministry of Health (see Appendix A), as well as IRB approval from Walden University. I only used the data on ANC visits and other constructs of interest for the purpose of this study, and I stored information on my personal, password-protected computer.

Dissemination of Findings

This study provided information on the utilization of antenatal care services as measured by the number of ANC visits between 2011 to 2015 in hospitals offering free maternal and child health service programs in the state to policy makers, health care professionals, academicians, and the general public. I will inform the public of the study's findings through electronic (television, and radio) and print (newspapers, posters, and billboards) media. I will inform the academic community, students, and other health care actors through scientific journals and conferences. I will also hold a sensitization meeting with stakeholders in the state to inform them of the findings, and I will write a technical report to the state Ministry of Health. The aim of this reporting is to enhance

and sustain the social change that the program was designed to produce by removing financial barriers and encouraging the subsequent positive impacts on pregnancy outcomes.

Summary

In Chapter 3, I presented the research method in detail for a quantitative, non-experimental, cross-sectional study whose intent was to investigate how the IVs (JSFMCHP, education, employment, and parity) singly or in combination were related to the DV (number of ANC visits) between 2011 and 2015. Archival data from HMIS database were obtained and analyzed using chi-square and multiple logistic regressions. I also describe the methodology including the study design, sampling, data collection, and analysis strategies. Human subject protection and dissemination of study findings are also part of this chapter. In chapter 4, I, presented the result of the study

Chapter 4: Results

Introduction

The purpose of this study was to investigate the impact of JSFMCHP on health care utilization. I conducted a secondary data analysis of Jigawa State antenatal records to explore the relationship between some key variables and the JSFMCHP. The analysis was done in three stages: I first computed descriptive statistics. After doing so, I analyzed the chi square to find out if the independent variables in the study were related to the dependent variable. Finally, I performed a multiple logistic regression to detect whether there was an association between the four independent variables (JSFMCHP, education, employment, and parity) and the dependent variable (ANC visits).

I also explored the role of a key determinant of health utilization, distance. The committee added this key determinant during proposal defense because of the important role it plays in health care utilization. My committee members stated that it would be good to review the impact, if any, of distance on health care utilization even though it was not included as an independent variable in the proposal. For this reason, I incorporated it during the data collection process.

The research questions and the hypotheses for this study were as follows:

RQ1: What is the association between JSFMCHP and the number of ANC visits?

H_01 : There is no association between JSFMCHP and the number of ANC visits.

H_11 : There is association between JSFMCHP and the number of ANC visits.

RQ2: What is the association between education of pregnant women in Jigawa state and the number of ANC visits?

H₀₂: There is no association between education of pregnant women in Jigawa state and the number of ANC visits.

H₁₂: There is association between education of pregnant women in Jigawa state and the number of ANC visits.

RQ3: What is the association between employment of pregnant women in Jigawa state and the number of ANC visits?

H₀₃: There is no association between employment of pregnant women in Jigawa state and the number of ANC visits.

H₁₃: There is association between employment of pregnant women in Jigawa state and the number of ANC visits.

RQ4: What is the association between parity of pregnant women in Jigawa state and the number of ANC visits?

H₀₄: There is no association between parity of pregnant women in Jigawa state and the number of ANC visits.

H₁₄: There is association between parity of pregnant women in Jigawa state and the number of ANC visits.

This chapter includes a description of the study sample and descriptive statistics. It also includes results of the chi-square analysis and multiple logistic regressions, along with a summary of the analysis. I conducted the analysis using SPSS (Version 21).

Data Collection

The study sample included women who attended antenatal care in the 12 general and 10 primary health centers in the state of Jigawa from 2011 to 2015. Using Maxwell's (2000) approach to sample size determination, I randomly selected a total of 332 women from the antenatal records of the state ministry of health contained in the HMIS database after I received approval from the state's Ministry of Health through the permanent secretary. I then increased the selection from 332 to 400 pregnant women to increase the generalizability of the study. I received IRB approval from Walden University (approval number: 10-06-17-0301339) on October 10, 2017, and before commencing data collection.

With the help of the Ministry of Health records clerk, I entered the data into a Microsoft Excel spreadsheet using information on the study variables (those who benefitted from the program, those who did not, educational level, employment status, and parity). Although distance from the health facility was not among the study variables, I included it at the request of my committee. I checked the data for coding errors, missing data, and duplication. After doing so, I imported the spreadsheet into SPSS Version 21 and then ran descriptive, chi-square, and multiple regression tests. Although the designated points (12 general hospitals and 10 primary health centers) offered JSFMCHP, participation is voluntary, meaning the ANC staff sometimes cannot enroll all the pregnant women who seek ANC due to inadequate funding. The comparison group was the women who did not participate in the program. Zero ANC visits was not a possibility

because the first contact with ANC staff is marked as the first ANC visit for all pregnant women, irrespective of whether or not they participated in the program.

Predicting ANC Visits

The goal of this analysis was to examine how the JSFMCHP as well as education, employment, and parity contributed to ANC visits during pregnancy. I conducted the analysis in three steps. First, I calculated descriptive statistics and one-way chi-square tests. Second, I calculated Pearson's chi-square tests to examine whether each variable of interest individually had an association with the outcome variable (ANC visits). Finally, I conducted a multiple logistic regression to see if the variables simultaneously had an influence on the binary outcome of ANC visits.

Results

Descriptive Statistics

The majority of participants in the study had one to three ANC visits during pregnancy, as opposed to four or more visits, and this difference was statistically significant, $\chi^2 (1) = 32.49, p < .001$. The majority of participants had five or more pregnancies (49.5%), while 41.9% of participants had two to four pregnancies, and, for 8.6% of participants, it was their first pregnancy. This difference in frequencies between these categories was statistically significant, $\chi^2 (2) = 111.63, p < .001$. The majority of participants (52.6%) had no formal education, while 21.9% of participants had a primary school education, 14.8% had a secondary education, and 10.7% had a tertiary education, and these differences were statistically significant, $\chi^2 (3) = 168.82, p < .001$.

With respect to employment status, 74.8% of the sample was not employed, while 25.2% were employed. The difference in frequencies between these two categories was statistically significant, $\chi^2 (1) = 95.76, p < .001$. Forty-six percent of the sample lived less than 2 km (a walking distance of 30 minutes) from a health facility, while 54% of participants lived more than 2 km from a health facility, but this difference was not statistically significant $\chi^2 (1) = 2.56, p = .11$. Finally, 189 participants were covered by the JSFMCHP, while 206 were not, and this difference was not statistically significant, $\chi^2 (1) = .73, p = .39$. Because of a small amount of missing data across all variables, all subsequent analyses were performed using listwise deletion of missing values.

Frequency distributions for major study variables are presented in Table 3 and Figures 5 through 9.

Table 3

Frequency Distributions for Major Study Variables

JSFMCHP	Frequency	Percent
Participation in the program	189	47.8
Non participation in the program	206	52.2
Total	395	100
Missing	6	
Parity	Frequency	Percent
First pregnancy	34	8.6
Two to four pregnancies	165	41.9
Five or more pregnancies	195	49.5
Total	394	100
Missing	7	
Education	Frequency	Percent
No formal education	206	52.6
Primary education	86	21.9
Secondary education	58	14.8
Tertiary education	42	10.7
Total	392	100
Missing	9	
Employment Status	Frequency	Percent
Not employed	291	74.8
Employed	98	25.2
Total	389	100
Missing	12	
Distance	Frequency	Percent
Less than 2km from health facility	184	46.0
More than 2km from health facility	216	54.0
Total	400	100

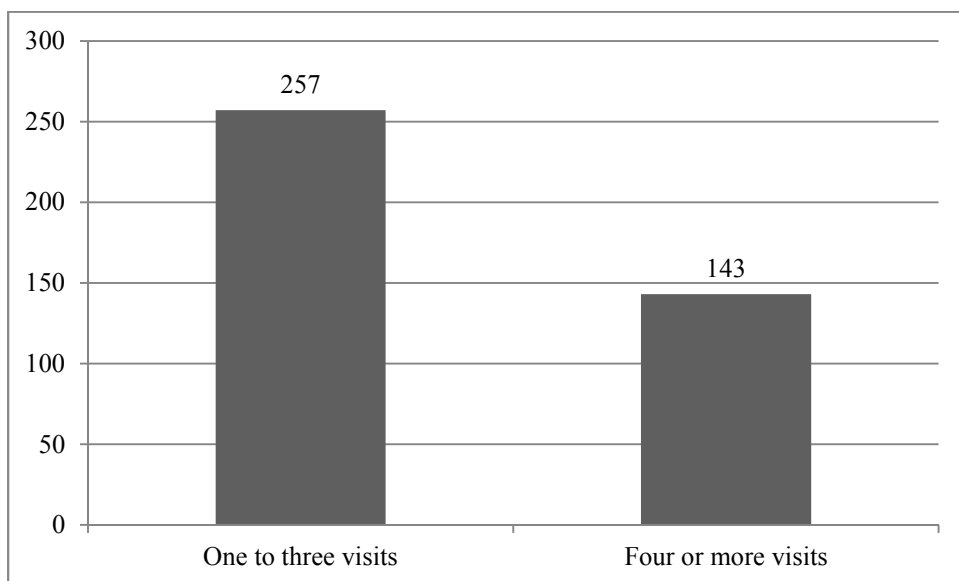


Figure 5. Histogram displaying frequencies for ANC visits.

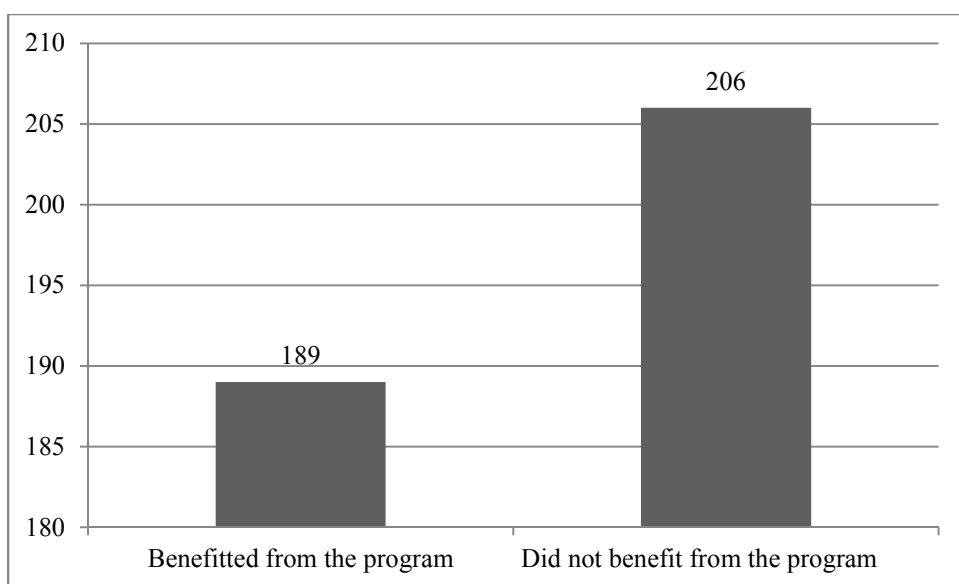


Figure 6. Histogram displaying frequencies for Jigawa State Free Maternal Child Health Program participation.

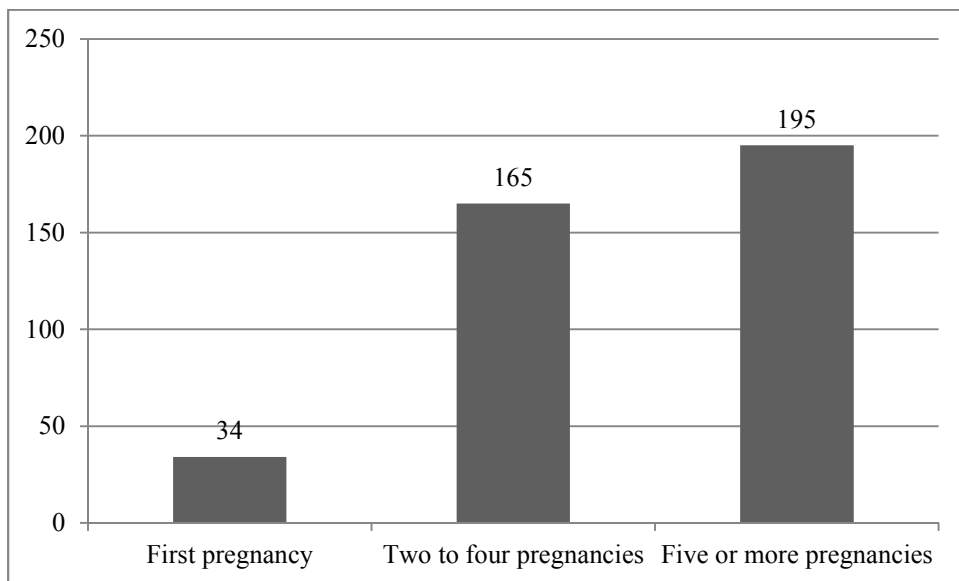


Figure 7. Histogram displaying frequencies for parity.

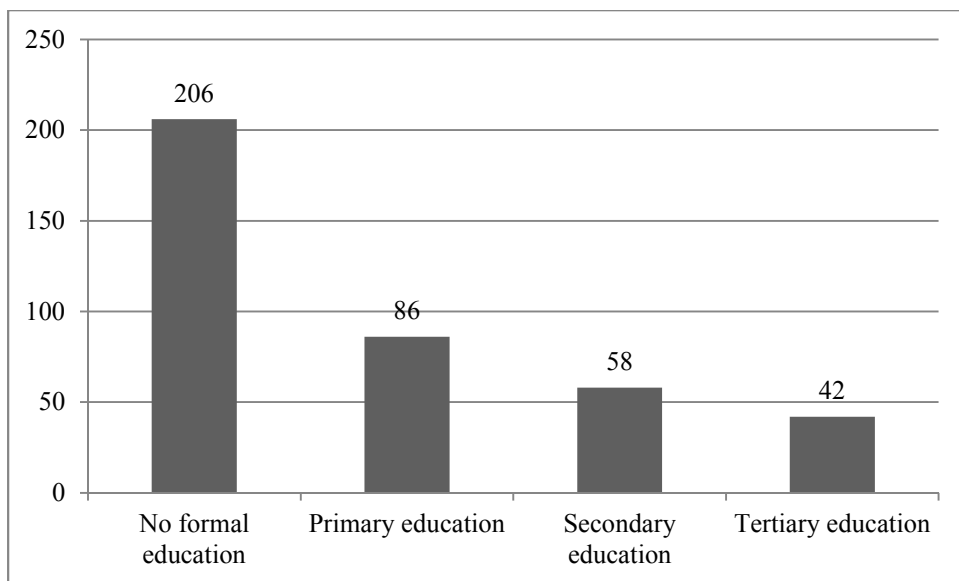


Figure 8. Histogram displaying frequencies for education level.

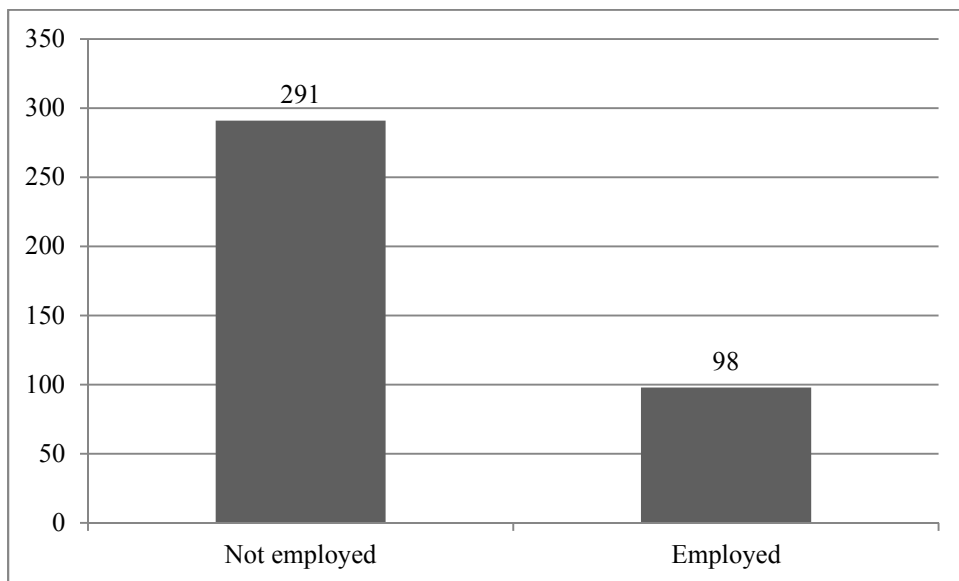


Figure 9. Histogram displaying frequencies for employment status.

Hypothesis 1

RQ1: What is the association between JSFMCHP and the number of ANC visits?

I hypothesized that there would be statistically significant relationship between JSFMCHP and number of ANC visits. The findings illustrated in Table 4 showed that there was a statistically significant association between JSFMCHP participation and ANC visits, such that those who participated in the program were less likely to have four or more ANC visits, $\chi^2 (1) = 52.05, p < .001$. I rejected the first null hypothesis.

Table 4

Cross-Tabulation Results for JSFMCHP and Number of ANC visits

JSFMCHP	Number of ANC visits	
	One to three visits	Four or more visits
	n%	n%
Participated	155 (62.0)	97 (38.0)
Did not participate	34 (24.0)	109 (76.0)

Note: Percentages reported above are within JSFMCHP. The number of ANC visits differs across program status, $\chi^2 (1) = 52.05, p < .001$.

Hypothesis 2

RQ2: What is the association between the education of pregnant women in Jigawa State and the number of ANC visits? I hypothesized that there was a statistically significant relationship between education and the number of ANC visits. Table 5 shows that there was a statistically significant association between education level and ANC visits, such that those with higher levels of education were more likely to have four or more visits, $\chi^2 (3) = 78.47, p < .001$. Thus, I accepted the alternative hypothesis.

Table 5

Cross-Tabulation Results for Education and Number of ANC visits

Education level	Number of ANC visits	
	One to three visits	Four or more visits
	n%	n%
No formal education	161 (78.0)	45 (22.0)
Primary education	55 (64.0)	31 (36.0)
Secondary education	29 (50.0)	29 (50.0)
Tertiary education	4 (10.0)	29 (50.0)

Note: Percentages reported above are within educational level. Number of ANC visits differed significantly across educational level, $\chi^2 (3) = 78.47, p < .001$.

Hypothesis 3

RQ3: What is the association between the employment of pregnant women in Jigawa State and the number of ANC visits? I hypothesized that there was a statistically significant relationship between employment and number of ANC visits. Table 6 shows that there was a statistically significant association between employment status and ANC visits such that those who were employed were more likely to have four or more visits, $\chi^2 (1) = 45.92, p < .001$. Therefore, I rejected null hypothesis 3.

Table 6

Cross-Tabulation Results for Employment and Number of ANC Visits

Employment status	Number of ANC visits	
	One to three visits	Four or more visits
	n%	n%
Employed	34 (14.0)	212 (86.0)
Not employed	64 (45.0)	75 (55.0)

Note: Percentages reported above are within employment status. The number of ANC visits differed significantly across employment status, $\chi^2 (1) = 45.92, p < .001$.

Hypothesis 4

RQ4: What is the association between the parity of pregnant women in Jigawa State and the number of ANC visits? I hypothesized that there was a statistically significant relationship between parity and number of ANC visits. Table 7 shows that there was not a statistically significant association between parity categories and ANC visits, $\chi^2 (2) = 5.61, p = .06$. I did not reject the fourth null hypothesis.

Table 7

Cross-Tabulation Results for Parity and Number of ANC visits

Parity	Number of ANC visits	
	One to three visits	Four or more visits
	n%	n%
First pregnancy	20 (59.0)	14 (41.0)
Two to four pregnancies	96 (58.0)	69 (42.0)
Five or more pregnancies	36 (38.0)	59 (62.0)

Note: Percentages reported above are within parity status. Number of ANC visits did not differ significantly across parity level, $\chi^2 (2) = 5.61, p = .06$.

Although distance was not a variable considered in the study, I did assess its impact. A Pearson chi square revealed that distance was significantly associated with ANC visits, $\chi^2 (1) = 80.19, p < .001$, such that those who were less than 2km from a health facility were more likely to have four or more visits.

Predictors of Number of ANC Visits

In order to test the influence of each of the previous variables simultaneously, I used a multiple logistic regression model, with all variables predicting the categorical outcome of ANC visits (see Table 8). I dummy coded education, and set no formal education as the reference group. I also dummy coded parity, and set first pregnancy as the reference group. Distance, employment status, and tertiary education were all associated with ANC visits, such that being less than 2km from a health facility, being

employed, and having a tertiary education predicted a greater likelihood of having four or more ANC visits.

With respect to the major study variable, participation in the Jigawa State Free Maternal Child Health Program did predict ANC visits, such that those who *did not* participate in the program were *more* likely to have four or more ANC visits. The odds ratio suggested that people who did not participate in the program (as compared to those who did), were 5.53 times as likely to have four or more ANC visits. Stated differently, controlling for all covariates, those who did not participate in the program were 450% more likely to have four or more ANC visits than those who did not participate from the program. Participation in the program or not was not significantly related to the number of ANC visits on education, employment, parity, and distance to the health facility.

Table 8

Multiple Logistic Regression Analysis Predicting ANC Visits

Predictor variable	B	Odds ratio	SE	P	95% CI	
					Low	High
Year	0.31	1.36	0.14	0.00	1.12	1.65
Distance	1.71	5.54	1.85	0.00	2.88	10.67
Employment status	0.86	2.36	0.83	0.02	1.18	4.71
Two to four pregnancies	-0.26	0.77	0.38	0.59	0.29	2.02
Five or more pregnancies	-0.49	0.61	0.30	0.31	0.24	1.59
Primary education	-0.02	0.98	0.34	0.96	0.50	1.95
Secondary education	0.65	1.92	0.78	0.11	0.87	4.27
Tertiary education	3.18	23.97	15.48	0.00	6.76	85.01
JFSMCHP	1.71	5.53	1.76	0.00	2.97	10.31

Note. $N = 384$. Psuedo $R^2 = .40$.

Summary

I rejected null hypothesis 1, as there was a significant association between JSFMCHP and the number of ANC visits, such that those who did not participate in the program were more likely to have 4 or more visits. I rejected null hypothesis 2 because tertiary education was associated with a greater likelihood of having 4 or more visits. I rejected null hypothesis 3, as women who were employed were more likely to have 4 or more ANC visits. I did not reject null hypothesis 4, as in the multiple logistic regression model, neither of the parity variables were associated with ANC visits. Finally, those living in areas less than two kilometers from the health facilities had four ANC visits or more.

In Chapter 5, I present a detailed discussion of findings and analysis interpretation as it affects research questions. I also discuss the social change implications of the study, the conclusions I drew from the study, and recommendation for future studies in this last chapter.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

ANC is one of the ways that the dangers of high maternal mortality in the developing world can be contained through early diagnosis and treatment of ailments and ensuring safe delivery, according to experts (Johri, 2014; Riddie, 2012). Efforts to strengthen ANC through various means in resource-constrained countries have been in place for over two decades (Bassani, 2013; Okunfua, 2011; Salam, 2014). Examples of these efforts include user fee policies, the provision of education to women, the fostering of women's empowerment through employment, and family planning. Although significant progress has been made towards fulfilling MDGs 4 and 5 and reducing Nigeria's infant and maternal death rates, the set objectives for the goals achievement were not met. One reason for this failure is lack of access of maternal and child health services due to poverty. In 2010, over 50% of the estimated 8.3 million pregnant women in Nigeria did not receive ANC while, among those who did, 45% made fewer than the four ANC visits recommended by WHO (WHO, 2013a). In this study, the proportion of women who had four or more ANC visits was found to be 36%, which is far below the figure reported by WHO (WHO, 2013a).

The main purpose of this study was to investigate the impact of JSFMCHP, education, employment, and parity on utilization measured by number of ANC visits in 12 state general hospitals and 10 primary health centers in Jigawa State, Nigeria, between 2011 and 2015. I developed four research questions for this study:

RQ1: What is the association between JSFMCHP and the number of ANC visits?

RQ2: What is the association between the education of pregnant women in Jigawa State and the number of ANC visits?

RQ3: What is the association between the employment of pregnant women in Jigawa State and the number of ANC visits?

RQ4: What is the association between the parity of pregnant women in Jigawa State and the number of ANC visits?

To answer the research questions, I used the state's HMIS archival ANC data and sampled 400 pregnant women who attended ANC between 2011 and 2015. I computed chi-square and multiple logistic regression statistics to investigate the statistical relationship between JSFMCHP, education, employment, and parity with the number of ANC visits. Participation in JSFMCHP and parity had no statistically significant relationship with number of ANC visits. Only education and employment were found to be associated with number of ANC visits. In addition, non participation in the program, being actively employed, and having obtained tertiary education were significant predictors of number of ANC visits.

Interpretation of Findings

Research Question 1

The first research question was: What is the association between JSFMCHP and the number of ANC visits? The null and alternative hypotheses were as follows:

H_0 1: There is no association between JSFMCHP and the number of ANC visits.

H_1 1: There is an association between JSFMCHP and the number of ANC visits.

The results confirmed that those who participated in the JSFMCHP program were less likely to have four or more ANC visits compared to those who did not participate. The results are in contrast to the findings of many previous studies in which researchers found that free user fee policies led to a higher number of ANC visits compared to user fee policies (i.e. Gopalan & Durairaj, 2012; Johnson, Goss, Beckerman, & Castro, 2012; Ponsor et al., 2011). Although those who participated in the JSFMCHP attended more ANC visits (one to three visits) compared to those who did not participate in the program, those who did not participate in the JSFMCHP were more likely to attend four or more ANC visits.

The findings were supported by some studies whose authors found that free user fee policies resulted in fewer visits than the WHO recommendation of four visits per ANC cycle (Abdu et al., 2000; Audibert & Mathonnat, 2000; Jacob & Price 2004; Liu & Mills, 2002; Meuwissen, 2002). The likelihood of a pregnant woman having four or more ANC visits depends on the ability of the woman, her husband or relatives, or community members to pay for such services or on the existence of a free user fee policy such as JSFMCHP. The lack of universal health insurance coverage in Nigeria, and the removal of the health subsidy in the 1980s, resulted in fewer ANC visits as services were paid out of pocket (Obiechina & Ekenedo, 2013). Payment for health services accounted for over 50% of household expenditure in 2011 alone (WHO, 2014).

In spite of the importance that finance plays in improving access to health care services, results of this study showed that JSFMCHP participants compared to those who did not participate in the program recorded less than four ANC visits. Similar findings

were reported in a study conducted in Northern Cameroon on factors influencing uptake of maternal child health services. The researchers found that 63% of those exempted from payment recorded less than four recommended ANC visits (Anthony, 2013).

Research Question 2

The second research question was: What is the association between the education of pregnant women in Jigawa State and the number of ANC visits? The null and alternative hypotheses were as follows:

H₀₂: There is no association between the education of pregnant women in Jigawa State and the number of ANC visits.

H₁₂: There is an association between the education of pregnant women in Jigawa State and the number of ANC visits.

I accepted the alternative hypothesis based on the results that showed a statistically significant relationship between education and the number of ANC visits ($p < .001$). This result is corroborated by many other studies conducted in the developing world. Authors of an Ethiopian study found that over 60% of pregnant women who attended ANC visits had either secondary or tertiary education (Birmeta, Dibaba, & Woldeyohannok, 2013). Similarly, Adeyemi et al. (2007) found that over 80% of those having four ANC visits and above had a tertiary level of education. In another study done in Southwestern Nigeria on factors responsible for ANC uptake, 70% of pregnant women attending ANC possessed a secondary level of education; attendance was higher (91%) among those with tertiary education (Awusi et al., 2009). B. I. Babalola (2014) also found education to be the highest predictor of ANC visits in southern Nigeria. The

researcher found that 98% of those with four or more ANC visits had a tertiary level of education (B. I. Babalola, 2014).

This study demonstrated that education is a major factor in ANC usage. The low usage of MHS services as measured by the number of ANC visits in the North Western and North Eastern Nigeria seems to be attributable to the low adult female literacy rate of less than 22% (National Population Commission, 2009). In comparison, the adult female literacy rate is over 80% in the South West region of Nigeria (National Population Commission, 2009). Education greatly influences time of marriage, number of children, use of family planning, and other aspects of decision-making, autonomy, and independence. Shim (2010) found that education increases a woman's health cultural capital by increasing her ability to access relevant health information for making an informed decision regarding reproductive health. Although education relates to other socioeconomic variables such as employment, income, and family wealth, it has been found to be statistically significant in predicting the number of ANC visits even after controlling for other variables. Similar findings were observed in a study on the role of education, employment, and empowerment in the use of MHS in 31 African countries and Asia (Ahmed et al., 2012).

The findings in this study are consistent with other studies from Nigeria (e.g. Fawole et al., 2012; Onookpono & Odimegwu, 2014), Kenya (e.g. Deasi et al., 2013; Yego et al., 2014), Netherlands (e.g. Ory & Van Poppel, 2013), and other developing countries (e.g. Wang et al., 2011). The findings from these studies and my study show ample evidence to demonstrate that education is strongly related to number of ANC visits

even after controlling for JSFMCHP, employment, and parity. This might be because education expands women's perceptions of the world, enhance their levels of autonomy, improve their job opportunities, better position them to negotiate their fundamental and reproductive rights, and allow them to embrace values and norms that promote and improve their health.

Research Question 3

The third research question was: What is the association between the employment of pregnant women in Jigawa State and the number of ANC visits? The null and alternative hypotheses were as follows:

H₀₃: There is no association between the employment of pregnant women in Jigawa State and the number of ANC visits.

H₁₃: There is an association between the employment of pregnant women in Jigawa State and the number of ANC visits.

The results of this study showed a statistically significant relationship between employment and the number of ANC visits ($p < .001$). The findings correlate with results reported by studies conducted in the developing world on the impact of employment on ANC visits (i.e. B. I. Babalola, 2014; Bako et al., 2012; Fawole et al., 2012; Kabir et al., 2005). Employment, income, and wealth play a key role in accessing health care services in developing countries. Women belonging to higher income quintiles tend to use MHS by several folds compared to their colleagues in the poorest wealth quintile (Knights et al., 2013). Unfortunately, the poorest quintile are also those commonly practicing early marriage and bearing more children as well as adhering to local negative norms.

Although employment is linked with education, income, and wealth, the results of this study demonstrated a statistically significant relationship with the number of ANC visits. Similar findings were reported in a Knights et al.'s (2013) study conducted in five African countries. The researchers found that 78% of those employed recorded four or more ANC visits (Knights et al., 2013). This study's findings further correlated with other studies' findings from South Africa (i.e. Zulu et al., 2012; Anthony et al., 2014), Ethiopia (i.e. Taraleen, 2013), and sub-Saharan Africa (i.e. Bohren et al., 2015). These researchers all found that employment is key in removing financial barriers for maternal health services access, evidenced by the increase in the number of ANC visits.

Research Question 4

The fourth research question was: What is the association between parity of pregnant women in Jigawa State and the number of ANC visits? The null and alternative hypotheses were as follows:

H₀₄: There is no association between parity of pregnant women in Jigawa State and the number of ANC visits.

H₁₄: There is an association between parity of pregnant women in Jigawa State and the number of ANC visits.

The results revealed no statistically significant relationship between parity and the number of ANC visits ($p = .06$). The study findings were in line with many studies conducted in developing world on the relationship between parity and the number of ANC visits (i.e. Fawole et al., 2012; Idris & Sambo., 2012; Ory & Van Poppel, 2013; Umar, 2016; Yego et al., 2014). Similarly, this study results conformed to the result by B.

I. Babalola (2014) in a survey in Western Nigeria in where 70% of multiparous woman recorded less than four ANC visits.

Parity is a known factor associated with ANC use (Fatso et al., 2012; Ory & Van Poppel, 2013; Yego et al., 2014). The results of this study showed parity had no impact on the number of ANC visits after controlling for other covariates. In this study, grand multipara (a term referring to women who have had five or more children) had the lowest number of ANC visits. This might be due to a false confidence that having experienced more births affords a woman an understanding of pregnancy, its complications, and ability to deal with problems that may arise at home. Thus, grand multipara have a misconception that childbirth becomes easier with each successive delivery as was similarly reported in India (Singh, Kumar & Pranjali, 2014). These beliefs have no scientific basis and studies have shown that such women carry higher risk of complications such as severe hemorrhage and cardiovascular related disorders (e.g. Hgberg & Wall, 1986; Ory & Van Poppel, 2013; Royston & Armstrong, 1989; Yego et al., 2014).

However, in this study, elderly grand multipara have lower number of ANC visits in contrast with findings from Ethiopia (Mekonnen & Mekonnen, 2003) and pooled DHS survey from several African countries that made comparison on the use of MHS among extremes of ages (less than 20 years and above 34 years) among women of reproductive age groups (Magadi et al., 2007). However, the results of both studies showed discordance by reporting a high number of ANC visits, and ironically high maternal deaths. In particular, Magadi et al. (2007) used data from 21 African countries that were

conducted at different times and the different time span was not taken into consideration when interpreting their results.

Distance from Health Facility

I attempted to look at the factor of distance from the health facility in relation to the number of ANC visits. Chi-square test results showed there is a statistically significant relationship between distance to health facility and the number of ANC visits ($\chi^2 (1) = 80.19, p < .001$). Those who were less than 2km from the health facility recorded four or more ANC visits compared to those living in areas more than 2km from the health facilities. The finding is supported by many studies where free user fee policies were established (i.e. B. I. Babalola, 2014; Ekabua et al., 2011; Fagbamigbe et al., 2015; Gopalan et al., 2012).

Access to health care services in developing countries is an essential component in achieving MDGs 3 and 4, which set the goal of decreasing MMR and IMR by two thirds in 2015 (WHO, 2014). One critical variable that has consistently been shown to affect access to health care in developing countries is the distance of a patient's household from a health center (Daskin, 2008). Decreasing health care utilization with increasing distance to health facility is a phenomenon referred to as distance-decay effect (Gething et al., 2004). One of the strategies used by many countries to address this issue is the mobile clinic. According to Daskin (2008), the goal of a mobile clinic is to provide accessible health care services for vulnerable populations by reducing traditional barriers to access such as distance, distrust of health care system, and poor cultural practice. The

mobile clinic offers a similar range of services offered by fixed clinics, excluding admissions, and other complex services.

Another solution to health care access posed by distance from health facilities is telehealth, which according to WHO (2005) involves the use of telecommunications and virtual technology to deliver health care services outside of traditional health care facilities. Telehealth is the most basic element of “eHealth,” which uses a wider range of information and communication technology (KTs). Telehealth allows patients to receive guidance for managing certain diseases and other health conditions at home. It also allows for a health care provider to be guided by superior colleagues elsewhere in diagnosis, management, and referrals. Well designed telehealth schemes can improve health care access and outcomes particularly for those with chronic diseases and for vulnerable groups. Not only do they reduce demand on crowded facilities, but they also create cost savings, and make the health sector more resilient (WHO, 2014).

Limitations of the Study

The sample size used ($n = 400$) was small to allow for generalization to all pregnant women attending antenatal care in the twelve general hospitals and ten primary health centers operating the JSFMCHP in Jigawa state. It is important to note that all the secondary health centers (12 general hospitals) offer free MCH programs, but only ten out of 685 primary health centers are offering the program. Therefore, the vast majority of pregnant women attending primary health centers and private health facilities were not included in this study. Furthermore, not all pregnant women participated in the

JFSMCHP; while some declined voluntarily, others did not participate due to lack of adequate funding.

Not including private hospitals and many primary health centers in the sample used for this study might lead to results different from those that may have resulted if they were included. An accurate estimate of true association is not possible in this study because the sampling is not representative, leading to selection bias.

I used secondary data collected by the state ministry of health to assess MCH usage as measured by the number of ANC visits that made it not possible to define study variables, and the sample used may not be representative of the general population. In addition, the methodology (cross-sectional study) used in the study does not infer causation between the independent variables and the dependent variable (see Ansiridi, 2015; Babbie, 2011; Eichler, 2013; Engel & Schutt, 2013; Frankfort-Nachmias & Nachmias, 2008). Therefore, only association between variables could be established.

Another limitation was errors faced with manual entry of the antenatal information of pregnant women and management issues. Although it is assumed that the errors were random rather than systematic, there is no way to validate this position. The small sample size, the percentage (10%) of health facilities offering the program in the state, and the limitation inherent with secondary data all contributed to the outcome of the study.

Recommendations

Since the inception of the JFSMCHP, no study has been done to assess its impact on utilization. Therefore, I recommend the outcomes of this study be presented to the

following stakeholders: politicians, Ministry of Health staff, including those working at provider points, religious leaders, traditional rulers, Ministry of Education staff, Ministry of Women's Affairs staff, NGOs, and Ministry of Empowerment staff. Based on the study findings, I made the following recommendations:

- The state government must ensure that the ANC package is available at all times in all the facilities offering the free MCH program. In other words, there should be no out of stock issues, in terms of ANC drugs. This was observed by Dzakpasu et al. (2013) to be responsible for poor utilization.
- Jigawa State government should fulfill its pledge of expanding the JSFMCHP program by involving more primary health centers in the state to offer free services. Free MCH services have been linked to better utilization (Ben Ameer, 2014; Delamou et al., 2015; Dzakpasu et al., 2013; El-Khoury, 2012).

Furthermore, building one functional PHC in each ward of the state, as pledged by the present state government, will address the distance factor that is significant in this study. Babatunde (2014) found that close proximity of pregnant women's homes to health centers increases the likelihood of having four or more ANC visits threefold. Furthermore, the state government should start an obstetrics outreach program, using the community health extension workers to offer ANC services to women in rural areas to improve and increase access to health care services. In addition, the state should embrace the use of a mobile clinic to reach pregnant women and other vulnerable groups in rural areas to expand access.

Although telehealth is documented to increase access to health care, it cannot be

used in Jigawa state due to the state's very poor information and telecommunication infrastructure.

- NGOs working in MCH areas in the state such as maternal and newborn child health (MNCH) should be encouraged to increase the number of health facilities, particularly primary health centers, offering free MCH services.
- The ministry of health should develop an incentives program for the ANC staff to compensate them for additional work they face due to large turn out of pregnant women. Incentives programs promote quality MCH services and motivate health workers (Johnson et al., 2013; Melaku et al., 2014; Morgan et al., 2013).
- The state government should upgrade current hospitals' infrastructures, as free MCH alone cannot achieve much needed utilization and better pregnancy outcomes. Pasha (2013) found that poor infrastructure had a negative impact on utilization and pregnancy outcome in southern Kenya.
- The Ministry of Health, in partnership with the Ministry for Women's Affairs, should develop an awareness program on the role of ANC towards healthy pregnancy and safe delivery.
- The state government should increase its efforts towards the free girl-child education program. Many studies, including this one, have demonstrated the positive role women's education plays in utilization of MCH services. Education was found by many researchers to be the single most important factor that predicts MCH utilization (Bohren et al., 2014; Johri et al., 2014; Lang'at et al., 2015; Leone et al., 2016; Maini et al., 2014).

- The state government should prioritize employment as a key to women's empowerment as well as other women's empowerment programs that will ensure financial independence. Umar (2006) found that income from employment, formal or informal, played a significant role in MCH utilization.
- Religious and traditional rulers should continue to educate their subjects on the importance of ANC for pregnant mothers and their unborn children. These leaders command respect in the community.
- Future studies should investigate the role quality plays on MCH utilization with emphasis on the recommended minimum number of ANC visits put forth by the WHO.
- Future studies should also determine the cost of MCH services for households in Jigawa State to better understand its impact on ANC visits.
- Finally, future research would be desirable on not only the number of ANC visits, but on pregnancy outcomes in general.

Implications

This study was designed to gather statistical information on predictors of MCH utilization measured by the number of ANC visits. The intent of this inquiry was to investigate the relationship between JSFMCHP, education, employment, and parity with the number of ANC visits. The goal of this research was to equip policymakers and community at large with factual information on study outcome.

The findings indicated that education, employment, and distance from health facility significantly impacted the number of ANC visits in the state. Therefore,

policymakers should focus more on girl-child education programs, women's empowerment, and adhere to distances to health facilities as recommended by WHO as key drivers to increasing utilization of MCH services.

This study's results refute the notion that those who participated in the program were more likely to have four or more ANC visits than those who did not participate considering the role financial barrier plays in MCH utilization. The findings indicate a need for a review of policies affecting the free MCH program, directing more resources to staff welfare, and infrastructure. The state will review the program in 2018, and this study will guide the policy makers in the review process. The study findings will help policy makers and health professionals to improve the health of pregnant women and children with the aim of reducing maternal morbidity and mortality and perinatal mortality.

Conclusion

The purpose of this quantitative, cross-sectional study was to investigate the association between JSFMCHP, education, employment, and parity and the number of ANC visits between 2011 and 2015. Using HMIS data collected by the Jigawa State Ministry of Health, I used chi-square and multiple logistic regression tests to determine association between independent and dependent variables. While I found no correlation between parity and those who participated in JSFMCHP with the number of ANC visits, I observed a significant statistical relationship between education, employment, and those who did not benefit from the program. The findings with regards to education and

employment were consistent with findings in the reviewed literature. On the other hand, the findings with regards JSFMCHP were inconsistent with those found in the literature.

This study will provide policymakers with factual evidence on the role JSFMCHP on utilization, as well as contributions of other key variables. In the end, the policymakers should adopt evidence-based approach to review and reposition the state free MCH program with a view to increasing utilization measured by number of ANC visits.

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Appendix A: Approval Letter to Access Database



MINISTRY OF HEALTH

Block B - Q2/Q3, Ground & 1st Floors, New Secretariat Complex,
P. M. B. 1003 Dutse, Jigawa State, Nigeria
E-mail: smoh_jigawa@yahoo.co.uk

Our Ref:

Your Ref:

Date:

4th April, 2017

Kazaure Nura Ibrahim,
Government House Clinic
Dutse, Jigawa State.
Sir,

**PERMISSION TO ACCESS HEALTH MANAGEMENT INFORMATION
SYSTEM (HMIS) DATABASE**

Following your application to gain access to the Jigawa State HMIS Database, you are hereby authorized to use the aforementioned database for the purpose of your PhD in Health services (Public Health Policy) at Walden University, USA.

We sincerely hope your dissertation (Impact of free maternal and child Health programme on utilization in Jigawa State) would have a positive impact in the state Health Care delivery system.

Thank you and best regards.

MAH 4/5/2017
Dr. Muhammad Abdullahi Kainuwa
 Permanent Secretary
 For: Health, Jigawa State
 DATE