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Factors That Determine the Place of Childbirth in Lagos State, Nigeria

Ohiemi Emmanuel Adegbe
Walden University

Walden University

College of Health Professions

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Ohiemi Adegbe

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Dr. Jennifer Oliphant, Committee Chairperson, Public Health Faculty
Dr. Tina Cunningham, Committee Member, Public Health Faculty
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Sue Subocz, Ph.D.

Walden University
2021

Abstract

Factors That Determine the Place of Childbirth in Lagos State, Nigeria

by

Ohiemi Adegbe

MBBS, University of Benin, 1996

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Public Health

Walden University

June 2021

Abstract

Nigeria is among the 10 countries in the world with the worst maternal mortality. Though

most of these deaths can be prevented using antenatal care (ANC) and having

institutional deliveries, in Nigeria, ANC attendance and institutional delivery are

suboptimal. Research is lacking on the reasons for the disparity between the use of

antenatal services compared to deliveries at health centers. The aim of this study was to

determine the associations between sociodemographic, obstetric, and health service

factors and the place of delivery used by pregnant women in predominantly urban,

cosmopolitan Lagos, Nigeria. Because both service delivery and demand factor

categories contribute to utilization, the focusing on the barriers theoretical model—with

the constructs of availability, accessibility, affordability, and acceptability of health care

provision as contributors to utilization—was used along with the health belief model. For

this cross-sectional study, secondary data from the 2018 Nigeria Demographic Health

Survey were analyzed using logistic regression. The results showed that there are two

important predictors for a pregnant woman to have an institutional delivery. First is

having four or more ANC visits, OR = 9.2 [95% CI: 3.7, 22], and second is where ANC

was obtained with OR = 6.4 [95% CI: 2.3,18] if it was at a public health center, OR =

11.7 [95% CI: 4.1,33] if it was at a private facility, and OR = 15.3 [95% CI: 1.6, 146] if

ANC was at any other place. The evidence from this study may inform policies that cover

obstetric care across public, private, and informal providers, which can ensure

standardized care packages. It may also potentially empower women to modify their

behaviors toward having institutional deliveries, thereby reducing maternal mortality.

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Dedication

This research work is dedicated to God, who has blessed me and graced me to be able to contribute to the body of knowledge. It is also dedicated to my wife, who has gone through pregnancy and delivery on two occasions. Finally, it is to all women who died from complications while giving birth.

Acknowledgments

The desire and the decision to take on the doctoral journey at Walden was a tough one. In the end, I am very happy that it was all worth the sacrifice. Yet, I cannot boast in myself, "for who makes you any different? And what do you have that you did not receive"? I have received all the encouragement, help, and support required to pursue my doctorate and, specifically, the dissertation.

I start by giving all the credit to God for life, grace, wisdom, and resilience to carry through. To my chair, Dr. Jennifer Oliphant, who has painstakingly reviewed my work with the principle that it is always best to get it right the first time, I am incredibly grateful. I still remember your phrase "go slow to go fast." I want to say a big thank you to my committee member, Dr. Tina Cunningham, for the extra touch with the methods.

What would I have done without the support of my wife, Ojonoka Adegbe (PhD candidate), for making an enormous sacrifice during this period? To Shelter and Uruojo, you are the best children I know in the world. I am grateful, Dr. Mike Egwu, for the access to your library. Dr. Nathaniel Afolabi and Dr. Adamu Onu, for your early guidance with statistics. Thank you, Yvonne Nwokedi, for the backup. Ecorys and UNC/FP CAPE team gave me the best enabling work environment.

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Chapter 1: Introduction to the Study

Pregnant women are expected to safely go through the gestation period and have the desired outcome under the presumption that the body is programmed to accommodate the developing fetus while preparing the mother for labor and delivery (Soma-Pillay et al., 2016). The physiological changes in pregnant women are widespread, affecting every organ of the body, and include changes in the uterus, as well as body weight, hematological, cardiovascular, respiratory, renal, gastrointestinal, and endocrine changes (Shagana et al., 2018; Soma-Pillay et al., 2016). At the end of an uncomplicated pregnancy, most of the associated physiological changes resolve without much residual effect, but this may not be the case with all pregnancies.

Every pregnancy has associated risks, and none is entirely free from risk (Rothman, 2014). There can be pathological deviations from the routine anatomical and physiological changes of pregnancy, and any effort put in place to monitor specified signs during pregnancy could contribute to improving maternal and fetal outcomes (Shagana et al., 2018). Because of the potential risk during pregnancy, death in childbirth contributes to as many as 211 deaths per 100,000 live births globally, with 94% of all these maternal deaths occurring in lower- and middle-income countries (United Nations Children's Fund [UNICEF], 2019). Of these countries, sub-Saharan countries have a higher prevalence of pregnancy-related deaths, accounting for 60% of global maternal mortality (World Health Organization [WHO], 2016). Nigeria's maternal mortality ratio is estimated to be 560/100,000 women (WHO, 2014), so for every 13 pregnant women in Nigeria, there is a likelihood of having one death, which is about 8% of every pregnancy (UNICEF, n.d.).

Risk factors associated with increased maternal mortality have individual and country-specific variations, but being an adolescent and having high parity, or the number of times a woman has given birth, is generally associated with having the highest risk for complications and death during pregnancy and childbirth (UNICEF, 2019). Country-specific factors that predispose women to inequalities increase the risk of maternal mortality and tend to be more pronounced in low-income countries (UNICEF, 2019). Whatever the risk factors, the significant causes of death are severe bleeding, infections, high blood pressure during pregnancy, complications from delivery, unsafe abortions, and existing chronic diseases to a lesser degree (Adeoye et al., 2015; UNICEF, 2019). About 15% of all births globally are estimated to result in life-threatening complications, which may occur during pregnancy, delivery, or postpartum periods (Otolorin et al., 2015). When most women are pregnant, it is rarely possible to eliminate the known risk factors, but there is a general agreement that the known major causes of maternal death are preventable (Adeoye et al., 2015; Odetola, 2015; UNICEF, 2019). The implication is that despite the presence of inherent risks and associated risk factors of pregnancy, it is still possible to prevent maternal deaths that occur from the commonly known causes.

Using obstetric services influences and contributes to improvement in both maternal and child outcomes. Experts have advocated for specific utilization of skilled antenatal care (ANC) and birth attendants globally as the most crucial intervention to reduce maternal mortality (Odetola, 2015). Obstetric services for pregnant women, which are enmeshed in a continuum of care, include prenatal or ANC, care during delivery, and postnatal care that is guided by a minimum package of care as recommended by the

WHO, which covers routine and emergency care (United Nations Population Fund [UNFPA], 2019). Providing the recommended minimum package is determined mainly by the availability of trained or skilled attendants and support staff who can utilize available technology to prevent and manage complications (UNFPA, 2019). Moreover, this necessary element of skilled health providers is mainly available in designated health facilities or obstetric centers (Engjom et al., 2014). For a country to achieve a reduction in maternal deaths, pregnant women must have access to care, which is demonstrable in the actual utilization of antenatal services and, more importantly, delivery services.

This nonaccess to obstetric care highlights the need to give attention to why pregnant women in Nigeria use other locations outside health facilities with no trained health providers to deliver their babies. I conducted this study to address the gap in knowledge on factors accounting for the limited utilization of health facility services for childbirth in Nigeria (Yaya et al., 2018), specifically Lagos. This study contributes information that may help policy makers and other stakeholders device public health policies, strategies and interventions to bring about institutional and social changes to improve childbirth in health facilities. Chapter 1 includes background information on the study topic, the problem statement, the purpose of the study, research questions (RQs) and hypotheses, the theoretical foundation, and the nature of the study. I also define key terms and discuss the assumptions, scope and delimitations, limitations, and significance of the study.

Background

Nigeria contributes about 10% of maternal mortality worldwide and ranks among the top 10 countries with the worst cases of pregnancy-related deaths (Adeoye et al., 2015). Many of the reasons for the pregnancy-related complications and death are preventable, especially when women use obstetric services during pregnancy and deliveries. Indeed, measuring the functionality of a health system can be achieved by calculating how much it positively contributes to reducing maternal morbidity and mortality globally. The use of skilled ANC and birth attendance are proxy indicators (Odetola, 2015). Despite the proven effectiveness of skilled birth attendants (SBAs) in assuring a good outcome for pregnant women and their unborn children (Ezugwu et al., 2014), if the target population does not use the services, the intended results will not be achieved. According to Ezugwu et al. (2014), in situations where pregnant women do not use both antenatal and delivery services, there is a 10-times higher risk for pregnancy complications, including death.

In Nigeria, the utilization of these key obstetric services has been very variable across the six different geopolitical zones, showing good to very poor utilization for either ANC or both ANC and deliveries (Nigeria Demographic Health Survey [NDHS], 2013). The consensus is that pregnant women in Nigeria use health facilities suboptimally for ANC and deliveries (NDHS, 2013, 2018). In North-West Nigeria, pregnant women's ANC attendance was 41% in 2013 and 53.9% in 2018, while health facility deliveries were 11.5% and 15.6% in 2013 and 2018, respectively (NDHS, 2013, 2018). In North Central Nigeria, 67% and 66.2% of pregnant women attended ANC in

2013 and 2018, respectively, while 45.7% and 49.2% of the women had health facility deliveries for the corresponding years. In North-East Nigeria, 49.3% of women used ANC in 2013, and 58.5% used ANC in 2018. In the same zone, there were 19.5% and 25.4% of health facility deliveries for 2013 and 2018, respectively (NDHS, 2013, 2018). In comparison to the north, more women use obstetric services in the southern part of Nigeria, but there is still cause for concern despite the difference in the observations. For the South-South zone, ANC attendance had progressed from 73% to 77.1% between 2013 and 2018, while health facility delivery rarely changed over the period from 50.1% to 50.2%. The South-East zone has shown to be best performing for the use of obstetric services based on the NDHS surveys, with 90.6% and 89.2% of women attending ANC in 2013 and 2018, respectively. Similarly, 78.1% and 81.8% of women had health facility delivery in the zone during both periods. In the South-West zone, which includes Lagos State, ANC attendance dropped from 90.4% in 2013 to 88.2% in 2018, while health facility deliveries increased from 75% in 2013 to 76.3% in 2018. (NDHS, 2013, 2018).

The percentages from 2013 and 2018 show a broad distinction between the northern and southern zones that can reflect two perspectives. With less than 60% of women using ANC and less than 30% having institutional deliveries in northern Nigeria (NDHS, 2013, 2018), much attention is required across the full intervention spectrum for any possible changes to occur. On the other hand, 85% of women use ANC, and 68% use health facilities for childbirth in broad southern Nigeria (NDHS, 2013, 2018). This southern picture presents a more focused challenge to the health system to address the critical gap between women who have ANC and those who have institutional deliveries.

It would require a proper understanding of the associated factors, particularly for the use of ANC and not health facilities for delivery. Such knowledge and lessons from Lagos can be applied to other parts of southern Nigeria while being integrated into ongoing efforts to improve ANC use in northern Nigeria to mitigate the gap in institutional deliveries.

As a matter of policy, the Federal Ministry of Health in Nigeria had adopted the WHO recommendation for pregnant women to make at least four ANC visits, with further adaptation to the focused ANC approach that specifies fixed periods during the gestation period for the four visits (Dahiru & Oche, 2015). However, physical access to health facilities may not be the most critical when it comes to utilization. This is evidenced from findings in northern Nigeria that the proximity of health services to pregnant women does not guarantee utilization. Neither does it specifically address the gap between ANC attendance and health facility deliveries (Dahiru & Oche, 2015; Idris et al., 2013). This nonutilization depicts a behavior pattern by pregnant women with underlying socioeconomic and cultural influences that encourage deliveries outside health facilities even after using ANC (Iyaniwura & Yussuf, 2009). The choice to utilize obstetric services is influenced by interacting social, economic, and health system factors, operating at the household, community, and health provider level and broader social and political levels (Onah et al., 2006). On the demand side, sociodemographic/economic factors, which include place of residence, religion, educational status, tribe, marital status, employment status, husband's professional and educational levels, age, and parity, were statistically significantly associated with deliveries at health facilities in research by

Onah et al. (2006). On the supply side, the choice for utilization was statistically significantly associated with the cost of services, a client's waiting time, doctors' and specialist obstetricians' availability, and their competence (Onah et al., 2006).

This behavioral pattern in the use of obstetric services is consistent with the 2013 NDHS finding, which revealed that 60.6% of pregnant women had at least one ANC visit, while 35.8% of women with recent deliveries gave birth in a health facility (NDHS, 2013). Furthermore, despite national increases in ANC attendance and institutional deliveries in 2018 of 67% and 39.4%, respectively (NDHS, 2018), the gap between the two had widened from 24.8% to 27.6% between 2013 and 2018. Regarding the consequence of the nonutilization of obstetric services, generally, in about 85% of pregnant women, there are no major obstetric complications during childbirth. However, when it does happen, it is usually sudden and unpredictable so that without a skilled health professional who is generally in a health facility, the maternal and perinatal outcomes tend to be poor and could lead to mortalities (WHO, 2013). Although the research regarding the utilization of obstetric services for ANC and deliveries shows essential findings, there is a need to understand the dynamics between the supply and the demand side and how women's sociodemographics overlays in influencing the use of health facilities for childbirth.

Problem Statement

Pregnancy and childbirth are a series of socially encouraged and widely desired physiological activities by women worldwide for a variety of reasons (Soma-Pillay et al., 2016). Nigeria is one of the 10 countries responsible for 60% of all maternal deaths

worldwide while contributing 10% of all pregnancy-related deaths, and these deaths are

largely preventable (WHO, 2014). With a maternal mortality ratio of 560 per 100,000

women in the country (WHO, 2014), the situation is a public health issue that requires

attention. With appropriate behavior changes on the supply side by health providers) and

demand side by pregnant women and people associated with them, there may be hope to

reverse the trend. Two thirds of maternal deaths are thought to be caused by

complications around childbirth that were not predictable during pregnancy, with home

delivery being the single most significant contributing factor (Abera et al., 2016). With

only 42.9% of births occurring in the health facility (Abera et al., 2016), this continues to

be a challenge in Sub-Saharan Africa.

Meanwhile, experts affirm that the delivery of a pregnancy by an SBA is a

strategy that can lower maternal mortality by about 20% because of the likelihood of

reducing peripartum complications (UNICEF, 2019). It underscores the inclusion of

SBAs as one of the United Nations sustainable development goals indicators to monitor

efforts at reducing maternal mortality globally (UNICEF, 2019). However, the global

acknowledgment of ANC and skilled birth attendance as the most crucial intervention to

reduce maternal mortality (Odetola, 2015) does not always translate to expected behavior

patterns, especially institutional delivery. Because of this observed anomaly, the

underlying reasons and factors continue to demand answers, especially because it is a

negative trend.

The observed gap between ANC attendance and delivery at a health facility

(which is a proxy for delivery by an SBA) seems to have worsened over the years, with

23% of Nigerian women less likely to use skilled delivery services in 2013 compared to 2003. Particularly for Lagos, the index state, while 94% had attended ANC for their pregnancy, 77% of women were delivered in a health facility (NDHS, 2013). From a public health standpoint, this gap is vital because Lagos is the most populous state in Nigeria, with over 12 million persons in 2016 (NBS, 2018), with 7.2% of the population estimated to be pregnant (NDHS, 2013). When extrapolated, it shows that from an estimated 864,000 pregnant women in Lagos, nearly 200,000 of them had deliveries outside a health facility, which places them at a higher risk of complication and maternal death.

Two additional contextual issues, specific to Lagos State, highlight the observed gap in the use of health facilities for delivery. First is gross urbanization, which presents a unique physical and functional inaccessibility to health services, including for childbirth (Atuoye et al., 2017). Second is the relatively large number of private health providers compared to the public health facilities (Lagos State, 2017), which can potentially limit access to obstetric care, including deliveries. The predominance of private health facilities in Lagos State presents a unique problem for pregnant women who do not have enough money to meet the cost of delivery by a private provider. At the time of delivery, they will tend to have deliveries outside health facilities (Wong et al., 2018). Such a scenario typically describes Lagos State, where 56.1% and 21.1% of childbirths between 2011 and 2013 occurred in private and public facilities, respectively, while 21.7% took place at home (NDHS, 2013). Although there have been some studies conducted to understand the determinants for the utilization of ANC and institutional delivery by

pregnant women in Nigeria (e.g., Idowu et al., 2017), there are gaps in the literature

regarding why some pregnant women would use ANC but decline to have institutional

delivery.

In reviewing the literature, I found only one study conducted in Nigeria that

considered the availability of private health facilities as a factor for using ANC and

delivery in health facilities (Wong et al., 2018). However, the researchers clustered

private health facilities from different geographic locations of the country and aggregated

the findings from states where there are few private facilities together with other states

with mostly private facilities. The clustering design affected the ability to accurately

attribute private facilities' influence in the individual states because of the inability to

apportion accurate weighting or contribution by each location. In this study, I addressed

the gap posed by private health facilities' predominance in relation to other factors

associated with the use of ANC and having institutional delivery.

Purpose of the Study

The purpose of this study was to investigate the factors that influence the use or

nonutilization of health facilities by pregnant women in Lagos, Nigeria, for deliveries. I

considered the observed gap between women who attend ANC but do not deliver in

health facilities. An exploration of the factors of influence of use or nonuse of health

facilities led to recommendations for interventions to fill the gap between ANC

attendance and health facility deliveries. Secondary data were used to determine the

prevalence of health facility deliveries and to see if facility type was associated with any

difference in sociodemographic characteristics, obstetric factors, and health system factors.

Research Questions and Hypotheses

RQ1.   Is there an association between sociodemographic factors (age, educational status of women and their husbands, wealth status, place of residence) and the place of delivery used by pregnant women in Lagos State?

$H_0$1: There is no significant association between sociodemographic factors and the place of delivery used by pregnant women in Lagos State.

H_a1: There is a significant association between sociodemographic factors and the place of delivery used by pregnant women in Lagos State.

RQ2.   Is there an association between obstetric factors (parity, number of children, use of ANC) and the place of delivery used by pregnant women in Lagos State for delivery?

$H_0$2: There is no significant association between obstetric factors and the place of delivery used by pregnant women in Lagos State.

H_a2: There is a significant association between obstetric factors and the place of delivery used by pregnant women in Lagos State.

RQ3.   Is there an association between health service factors (the type of facility, distance from residence, cost of services, quality of care), and the place of delivery used by pregnant women in Lagos State?

$H_0$3: There is no significant association between health service factors and the place of delivery used by pregnant women in Lagos State.

H_a3: There is a significant association between health service factors and the

place of delivery used by pregnant women in Lagos State.

Theoretical Foundation

The theoretical model used for the study was the focusing on barriers model,

which emphasizes the strategies for improving health care access. Penchansky and

Thomas (1981) introduced the focusing on barriers model to understand health care

disparities using the proxy of utilization. It considers how individual factors such as

income, having health insurance, and having a usual source of care can contribute to

usage. Also, it assumes that availability, accessibility, affordability of health care

services, and acceptability of type of services and health care providers from the clients'

perspective all contribute to utilization (Derose et al., 2011).

Table 1

The Focusing on the Barriers Model

Model	Dimension	Example
Original Penchansky and Thomas model	Availability of health care resources	Resources (such as health workers, equipment, and other infrastructure)
	Accessibility in terms of geographic coverage	This includes the locations of primary health centers and secondary health centers. And their distribution between urban and rural areas. It also covers distance and transportation.
	Accommodation looks at the organization of types of services and their delivery	Continuum of care from primary to secondary through effective referral linkages. Integrated care
	Acceptability relates to the perceptions and expectations of potential beneficiaries and the attitude and quality of service by the providers	This is determined by the individual characteristic of the beneficiaries (age, education, income level, place of residence, parity) and that of the provider (level of training, specialization, type of health worker)
Added by Mackillop as an essential dimension of access	Awareness of the range of services and the reasons for using them	Provider and beneficiary awareness of the details of services offered during ANC and delivery with evidence justifying the necessity for utilization

Note. Information in the table comes from Urquhart et al. (2016).

A vital element of this study's model was the degree of fit between the potential users, pregnant women, and the health care system. It describes the client's perception of service fitness in the right quantity and quality and other individual social factors and expectations (Derose et al., 2011). The user perspective of accessibility considers the physical distance and affordability of health care services, which is viewed either in absolute terms, where some persons of low socioeconomic status cannot pay for services or in relative terms, where other available options are cheaper and acceptable (Derose et al., 2011). The model applies to the first three RQs. The inquiries include sociodemographic variables and the perceptions related to individual obstetric factors and appropriateness of the obstetric health care to women's needs.

I also drew from the basic tenets or concepts of the health belief model (HBM), which explains and predicts behavior patterns that prevent, screen, or control illness conditions. The model identifies perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action, and more recently, self-efficacy (Glanz et al., 2010). These elements describe how individuals perceive their vulnerability to health risk and how potentially life threatening such danger can be. Also, it considers their perception of the relevance and usefulness of the available intervention to mitigate the risk and how willing they are to pay the price to take the desired action. The HBM can be used quite readily with the second and third questions to elicit the extent to which women perceive any risk associated with pregnancy and how that sufficiently motivates them to want to use skilled obstetric services because of the perceived benefits.

Nature of the Study

Using a quantitative approach, I analyzed secondary data from the NDHS conducted every 5 years from a representative household survey-type questionnaire. At the time of this study, I used the 2018 NDHS, the most recent wave. The independent variable included all the relevant and necessary sociodemographic characteristics of eligible women, including age, education level, income, place of residence, partner's education. It also included obstetric factors such as parity, number of children, and ANC attendance. Health service factors included the type of facility (public versus private facility), cost, distance from the facility, quality of care, and service availability. The dependent variable was the place of delivery, reassigned from the list in the NDHS tool (home, public health provider, TBA, private provider) into health facility or non-health facility delivery, making it a binary variable. I went ahead to determine the association of the independent variables with the place of delivery. The logistic regression was the statistical analysis of choice to help answer the RQs.

Data Collection

Upon receipt of Institutional Review Board (IRB) approval from Walden University, I obtained secondary data from the National Population Commission in Nigeria for the recently concluded 2018 NDHS. Three questionnaire types made up the NDHS instrument: The Household Questionnaire, the Woman's Questionnaire, and Man's Questionnaire. These tools were from the model questionnaires developed by the MEASURE NDHS program but adopted to suit each country's requirements following extensive consultations. The Woman's Questionnaire is responded to by women aged 15-

49 years. The questions cover the following areas: background characteristics (age,
religion, education, literacy, media exposure, amongst others), reproductive history and
childhood mortality, knowledge, source, and use of family planning methods, fertility
preferences, antenatal, delivery, and postnatal care, breastfeeding and infant feeding
practices, child immunization and childhood illnesses, marriage and sexual activity,
women's work and husbands' background characteristics, malaria prevention and
treatment, women's decision making, awareness of AIDS and other sexually transmitted
infections, maternal mortality, and domestic violence. The secondary data set was
essentially the women section of the 2018 NDHS.

Definitions

Antenatal care (ANC): The routine, specialized care offered by a trained health
worker that includes risk identification, prevention, treatment of any underlying disease,
and health promotion. The aim is to ensure a good outcome for the mother and child
(McNellan et al., 2019).

Institutional delivery: The act of giving birth by a woman in a health facility
where infrastructure is available, under the supervision of a trained health worker, to
ensure the safety of the mother and child (Yoseph et al., 2020).

Maternal mortality: The death of a woman during pregnancy or within 42 days of
delivery for which the cause is related to the pregnancy (WHO, 2021).

Obstetric services: A specialized package of care that is available to women
during pregnancy, delivery, and after childbirth (Gynecology and Obstetrics Case
Reports, 2021).

Parity: The number of times a woman gives birth to a life or a dead fetus that had attained a minimum gestational age of 24 weeks (Patient, 2019).

Postnatal care: Specialized care given to a mother and her baby immediately after childbirth and lasting up to 6 weeks (The Open University, 2021).

Private health facilities: Primary-, secondary-, and tertiary-level health centers that are owned by individuals or investors for the sole aim of profit-making (Super Brokers, 2020).

Public health facilities: Primary-, secondary-, and tertiary-level health centers that are government-owned and not primarily profit-driven (Law Insider, 2021).

Skilled birth attendant (SBA): A doctor, nurse, midwife, or any other trained health personnel who can provide essential and emergency care to a woman and her baby during and after childbirth (Utz et al., 2013).

Sociodemographic factors: Social factors such as wealth, religion, education level, family size, and population density that influence a person's lifestyle; these factors are expressed statistically according to a defined population (Check Market, 2020).

Socioeconomic status: A combination of variables such as income, occupation, education, and place of residence that place an individual within a hierarchical social structure (American Psychological Association, 2021).

Traditional birth attendant: A pregnancy and childbirth care provider whose experience and knowledge is acquired from the practices of the communities they reside in rather than formal training (Aziato & Omenyo, 2018).

Assumptions

Two assumptions related to the place of delivery were put forward for the study. The first assumption was that an SBA took every institutional delivery. The relevance is the added value that the availability of trained health workers brings to women during childbirth (UNFPA, 2014). Therefore, institutional delivery is not an end by itself but a means of accessing SBAs. In order words, institutional delivery is a proxy measure for a pregnant woman whom an SBA delivered. The basis for the assumption is implicit in the definition of institutional delivery, which recognizes a trained health worker's supervision. Another assumption was that having institutional deliveries is associated with providing quality services to pregnant women by trained personnel. Underlying the assumption is that a trained health worker can offer the minimum package for essential and emergency care as defined by the WHO (Otolorin et al., 2015). Based on these assumptions, the dependent variable, the place of delivery, was modified to a binary variable to become either health facility or non-health facility delivery.

Scope and Delimitations

The specific aspect of the problem that the study addressed were factors that contributed to pregnant women in Lagos State, Nigeria, choosing to have their deliveries outside health institutions. I limited the scope of the study to responses obtained from a representative sample of women aged 15-49 years resident in Lagos State during the 2018 NDHS. Because the expectation is for pregnant women to be delivered by an SBA and this is a globally recognized indicator, it was used to determine the sample size. A state-by-state sampling error, including that for Lagos State, was calculated to determine

the internal validity and generalizability. To determine inclusion and exclusion for the

women's questionnaire, I assessed participants' responses to questions about the place of

delivery and delivery by an SBA. Those without live births within the 5 years were

excluded from responding to the questions.

Limitations

The inherent limitation of a secondary data set is the inability to control existing

data. Data collection for the 2018 NDHS was completed. There were a few missing or

incomplete data, and it was impossible to collect new data. However, the sample size was

much more than the required minimum. Another limitation associated with secondary

data and quantitative design for this study was that the association of factors with the

place where women gave birth does not explain why that happened. Last, because the

survey required that the women self report about their behaviors, there is a potential for

response bias. This bias usually happens when participants perceive that certain behavior

is expected or acceptable, in this case, using obstetric services for ANC and deliveries.

While the large sample size can reduce the sampling error, it will not alter the response

bias especially that it is a secondary data.

Significance

The importance of global efforts to reduce maternal mortality, especially in

developing countries such as Nigeria, remains a high priority as a development objective,

given its current inclusion among the United Nations sustainable development goals

(McArthur et al., 2018; WHO, 2019). Particularly noteworthy is that the utilization of

health facilities for childbirth is a significant contributor to preventing maternal deaths

(Odetola, 2015; UNICEF, 2019), whereas nonuse of health facilities remains a public
health challenge for Lagos and all other states of Nigeria. This study's results contribute
to a better understanding of determinants for the nonutilization of health facilities for
pregnant women's deliveries in the cosmopolitan, densely populated urban Lagos State.
The analytical framework included consideration of the context, the dynamic
sociodemographics, and the large private health providers' contribution that makes Lagos
State unique. The results obtained from this study may inform interventions that could
contribute to the national maternal indices.

Additionally, there may be opportunities for sharing the findings widely that may
inform interventions appropriate to other states of Nigeria. Available evidence suggests
that many women in developing countries use ANC, but a gap persists in the proportion
delivered by an SBA or which took place in a health facility (Atuoye et al., 2017; Boah et
al., 2018). Although institutional delivery can significantly reduce maternal mortality,
many women in low- and middle-income countries continue to give birth outside of
health facilities without skilled attendance (Alfred et al., 2017). This scenario reflects
Lagos, Nigeria, with a considerable gap of 17% between ANC users and institutional
delivery (NDHS, 2013) and where over half of maternal deaths occur during labor and
immediately postpartum (Oye-Adeniran et al., 2014).

As the current evidence indicates, the availability of health facilities or skilled
attendants does not guarantee utilization. This underscores the need to understand the
sociodemographic and cultural underpinnings of predominantly urban mothers' maternal
health-seeking behavior beyond service provision and health system strengthening

(Olusanya et al., 2010). However, studies are lacking that focus on the underlying causes of the limited utilization of health facility services for childbirth in Nigeria (Yaya et al., 2018) and more especially in Lagos. Therefore, this study contributes relevant and updated information that may help policy makers and other stakeholders to generate public health strategies and interventions to bring about institutional and social changes to improve childbirth in health facilities.

Summary

A seemingly physiological pregnancy process is not entirely free of risk and can present with various complications, including death. Globally, about 211 deaths per 100,000 live births are attributed to pregnancy, of which 94% occur in low and lower-middle-income countries like Nigeria (UNICEF, 2019). In particular, Nigeria contributes about 10% of maternal mortality worldwide (Adeoye et al., 2015) and has a mortality ratio estimated to be 560/100,000 women (WHO, 2014). Whereas the risk of pregnancy is present at every stage, two thirds of maternal mortality is due to complications occurring around the time of childbirth that may not have been predictable throughout pregnancy. Home delivery is the single most important contributing factor to maternal mortality (Abera et al., 2016).

Despite pregnancy-related risks and complications, it is possible to prevent maternal deaths from commonly known causes. Especially during childbirth, if an SBA supervises, it can lower maternal mortality by about 20% because of the likelihood of reducing peripartum complications (UNICEF, 2019). Another aspect of the problem is that some pregnant women will attend ANC but will not use health facilities to deliver

their babies. And there are no readily available studies to explain the gap between women who would use ANC but not have institutional delivery. It underscores that knowledge of the benefits of using ANC and skilled birth attendance to reduce maternal mortality (Odetola, 2015) does not always translate to expected behavior patterns, especially regarding institutional delivery. This study's objective was to investigate this social problem to determine the factors influencing the use or nonutilization of health facilities for deliveries by pregnant women in Lagos, Nigeria. In Chapter 2, I discuss related and relevant studies and identify research gaps that I sought to fill by conducting this study.

Chapter 2: Literature Review

Introduction

In this chapter, I engage with the literature to explain the widespread problem of nonutilization of obstetrics services, especially institutional delivery. I conducted the literature review based on theoretical foundation (the focusing on barriers model and the HBM) and three main focal areas of the investigation: sociodemographic factors, obstetric factors, and health service factors. I researched the association of the independent factors with the places that pregnant women choose to give birth. The chapter provides the scholarly foundation for the study based on previous research and ensures alignment with the RQs. Additionally, I highlight the identified literature gap. Before reviewing the literature, I provide an overview of the literature search strategy.

Literature Search Strategy

For the literature search, I primarily used the Walden Library and Google Scholar to access relevant articles on factors that determine the use of ANC and health facilities by pregnant women. The approach was progressive from a global perspective to highlight the public health relevance of maternal mortality and how sub-Saharan Africa, specifically Nigeria, is a significant contributor. More specific searches were related to the determinants of the use of health facilities for ANC and deliveries by pregnant women in Nigeria. The keywords used for the search include the following: *obstetrics*, *deliveries*, *health facilities*, *childbirth*, *skilled birth attendant*, and *utilization*. The Walden databases searched were EBSCOhost; CINAHL Database, CINAHL Plus, Medline, and Embase. The literature review was limited to the period between 2013 and

2019, except for a few instances where there was no recent article. Out of the 110 articles

that were found, 75 were used for my research.

Literature Review Related to Key Variables

Sociodemographic Factors

Sociodemographic factors are a broad range of characteristics that are usually

independent variables inherent to an individual's personality. This nearly inseparable and

intricate connection between personality and sociodemographic factors can influence a

person's exposures and how that person behaves (America's Essential Hospitals, n.d).

Globally, researchers have found evidence of the association between sociodemographic

factors such as age, race, ethnicity, language, wealth status, and education and

determining health outcomes (America's Essential Hospitals, n.d). In a rural community

in southern Nigeria, researchers observed that the desire and willingness to seek health

were influenced by sociodemographic factors such as education, income, age, sex, and

occupation type (Adam & Aigbokhaode, 2018). The implication is that each of these

factors or a combination could determine when, where, and how individuals, including

pregnant women, decide to seek health care and consequently affect their health

outcomes. This section of the literature synthesis focuses on some relevant

sociodemographic factors and how it influences ANC attendance and health facility

deliveries.

Age

Whether it be chronological or developmental, age can be viewed from the

perspective of maturity or the ability of an individual to perform or carry out specific

behaviors and functions expected for that age (Söğüt et al., 2019). Based on this, women of reproductive age group are those between 15-49 years. From a behavioral perspective, subclassifications of age groups enable the determination of behavior patterns that may differ from younger women compared to older ones. Such was the subclassification by Dahiru and Oche (2015) into 15-24 years, 25-34 years, and those who are 35 years and above, in their study to determine factors associated with the use of ANC, institutional delivery, and postnatal care services. Regarding the use of ANC, Dahiru and Oche, from the secondary analysis of the 2013 NDHS, showed that pregnant women who were between 15-24 years made at least four ANC visits compared to those in the other two groups. Those aged 35 years and above had a consistently higher odds of using ANC even when they did not have up to four visits. This observation is consistent with another study among rural women in Anambra State, South-East Nigeria, that older mothers used health centers for ANC services (Emelumadu et al., 2014). However, Fagbamigbe and Idemudia (2015), seeking to determine the barriers to ANC use in Nigeria, found a nonstatistically difference in the mean ages of 29.1 for nonusers and 29.4 for users of ANC. These observations would imply that while age is a critical variable for ANC use, it may be acting as a confounder or an effect modifier.

On the influence of pregnant women's age and their decision to give birth at a health facility, a bivariate analysis from two studies indicated that women aged 25 years and above were more likely than younger women to deliver in a formal health institution. However, with multivariate analysis, age was an inconsistent predictor for health facility delivery (Dahiru & Oche, 2015; Ononokpono, & Odimegwu, 2014). In another study to

determine factors influencing the location of delivery adjusted for those using ANC,

Egharevba et al. (2017) found that those who were less than 20 years had lower odds of

delivering in the hospital in comparison with those who were between 20-29 years, but

this was not a significant association. Whereas the association of age with institutional

delivery by pregnant women may not be statistically significant, it continues to be an

essential sociodemographic covariate amongst others.

Level of Women's Education

Another sociodemographic factor of interest is a woman's educational status or

level of education. A key element of having an education is the knowledge acquired in

the process, which potentially empowers the individual to choose delivery settings. Being

educated can increase the exposure to the needed information and the awareness required

for reproductive health decision-making. It is not surprising, then, that a woman's

educational level remains one of the consistent demographic variables in research related

to the utilization of maternal health services (Idowu et al., 2017). Formal education

usually determines educational level, and the categories can be no education, primary

education, secondary and postsecondary, or tertiary education.

Regarding the use of ANC by pregnant women, available evidence from studies

has shown that women with secondary or tertiary education are at least three times more

likely to use ANC services in comparison to those with no formal education. Although

the reasons for this observation may not be linear, the association was statistically

significant (Dahiru & Oche, 2015; Fagbamigbe & Idemudia, 2015; Fawole & Adeoye,

2015). Furthermore, in a study to review a woman's education status as a determinant of

maternal health care use in Nigeria, Fawole and Adeoye (2015) found that women with secondary or tertiary education were significantly more likely to use ANC than those with primary education or no formal education. In the same manner, secondary education or, more importantly, a tertiary education significantly influenced pregnant women's choice to deliver their babies in a health facility by as much as 2.5 times (Egharevba et al., 2017; Fawole & Adeoye, 2015; Nwankwo et al., 2019). Fagbamigbe et al. (2017) observed that a pregnant woman with tertiary education was three times more likely to have her baby delivered by an SBA who is usually in a health facility.

An educated pregnant woman may not necessarily have received instruction in school on topics related to maternal health services. However, education may improve the capacity to acquire knowledge from various sources, including health facilities, and eventually empower pregnant women to choose to use ANC and institutional delivery of their babies. With the importance of a woman's education to using obstetric services, it is essential to understand the relevance of the partner or husband's education level.

Husbands' Education

Because husbands have a role to play in decision-making, their level of knowledge becomes a factor to consider. As with a woman's education, Dahiru and Oche (2015) found that 67% of women whose husbands had a secondary level education had received at least four ANC visits, compared to 23% of women whose husbands had no formal education. The partner's education plays a similar role regarding the use of health facilities for delivery. Egharevba et al. (2017) observed that a pregnant woman whose husband has postsecondary education is 36 times more likely to deliver her baby in a

health facility compared with a partner with no education, 11.65 times more likely than if

the partner had primary education, and 4.12 times more likely than those with secondary

education. The observations reflect Nigeria being mainly a patriarchal society, where

male heads of households have a significant role in decisions that affect every member

(Male breadwinner, female homemaker: Patriarchy and women's work-life balance in

Nigeria, 2019). Such decisions would include choices of health facilities and types of

services that members can access. The more knowledgeable husbands are, facilitated by

their educational status, the more likely they would be disposed to allowing their wives to

use obstetric services. The decision to use ANC and health facility birthing services

cannot be complete without the financial capacity to pay. Hence there is a need to discuss

the economic status of households in the next section.

Household Wealth Status

Wealth status in the context of utilization can either be in the absolute availability

of disposable money that can purchase obstetric services or the potential to be able to pay

for desired services based on a regular source of income. Irrespective of the different

approaches to determine the wealth status for research, the general inferences have been

that wealth influences maternal health services utilization. On the association of wealth

with ANC attendance, a bivariate analysis indicated that the households belonging to the

wealthiest quintile were 18 times more likely to make at least one ANC visit than those in

the poorest wealth quintile (Dahiru & Oche, 2015; Fagbamigbe & Idemudia, 2017). This

same category of wealthy households was three times more likely to have made the

recommended four ANC visits during their last pregnancy when compared with those

classified as poor (Dahiru & Oche, 2015; Fagbamigbe & Idemudia, 2017). In the case of institutional deliveries, women in formal employment and those ranked with a higher socioeconomic status tended more to have health facility deliveries. In this case, women's employment status was also a factor in determining the household wealth status (Dahiru & Oche, 2015; Ononokpono & Odimegwu, 2014). Based on the wealth classification, women from low-income households have a 144% increase in the odds of not utilizing health facilities for delivery than women from wealthy households (Adedokun & Uthman, 2019). Obstetric services are like every other goods and service for which payment must precede the purchase. Therefore, the capacity to pay can be a determining factor in choosing where to purchase the service.

Place of Residence

There is a wide range of reasons people reside in a specified location or neighborhood, and such a decision can change as other sociodemographic dynamics change. Describing the environment where people live take into consideration various aspects such as population density, type of housing, and the range of infrastructure that is readily accessible. On this basis, the commonly adopted classification for residence is whether people are in urban or rural locations (Census Bureau, n.d; Pateman, T, 2011). Regarding both the use of ANC during pregnancy and institutional deliveries, the broad evidence from different studies suggests that the odds of utilization are lower for rural women than their urban counterparts and that the place of residence has become a consistent predictor, especially for health facility delivery (Babalola, 2014; Ononokpono & Odimegwu, 2014). The place of residence is relevant because of how it can influence

other variables for utilization, as was observed in Lagos, where living in rural areas was

significantly associated with use of health facilities for childbirth by women who had

used ANC (Babalola, 2014). Using ANC did not significantly predict institutional

delivery for urban dwellers in other research (Okafor et al., 2014). ANC as a determinant

will be reviewed more under obstetric factors. Meanwhile, the fact that Lagos State is

predominantly urban with associated peri-urban or suburban slums, characteristic of a

highly populated industrial city, raises the need to anticipate observations beyond the

simple rural or urban divide resident status.

Obstetric Factors

Obstetric factors refer to all that relates to a woman's health status during the

pregnancy period, childbirth, and postpartum, determined through history taking and used

to guide the type of care required. Although it can be extensive, the literature review's

attention is on those aspects relevant to the use of ANC and health facility for delivery.

Parity

Parity of a woman is the number of times that a fetus with a gestational age of 24

weeks or more was delivered, whether born alive or was stillborn (Gaillard et al., 2014).

From the obstetric perspective, it is a measure that a woman has gained repeated

experience through pregnancy from conception to a given outcome. Regarding the use of

ANC services, pregnant women who were yet to have given birth used ANC more than

those with previous deliveries, and this linear relationship decreased as parity increase.

According to research by Dahiru and Oche (2015). A similar pattern exists in the

association between parity of women and institutional delivery. A woman with parity of

two to four is most likely to use health facilities for childbirth. Those with parity of five

or more were less likely to deliver in a health facility compared with women who have

had one to two live births, other researchers found (Alfred et al., 2017; Ononokpono &

Odimegwu, 2014). These findings show that a woman's pregnancy experience, delivery,

and engagement with the social and health systems environment can influence her

behavior during subsequent pregnancies.

Number of Children

Fertility is the number of children a woman has given birth to who are alive. Like

parity, having living children is an experience that stays and grows in a woman's memory

and can potentially influence her behavior. Available evidence suggests a statistically

significant association between not attending ANC and having five children and above.

The same significant association applies between not having an institutional delivery and

having five children and above (Rosário et al., 2019). From another study, there was a

similar observation that women with one child had a 2.2 times greater likelihood than

those with 2-4 children and 3.9 times greater likelihood than those with five or more

children to deliver in a health facility (Egharevba et al., 2017).

Use of ANC

One of the frequently asked obstetric questions to pregnant women is about their

use of ANC during their previous pregnancy, a continuum of care from pregnancy

through delivery. As expected, women who use ANC services in designated health

facilities tend to be more likely to deliver in the facility. This finding is consistent with

the observation by Dahiru and Oche (2015) that 56% of women who had a minimum of

four ANC visits had their deliveries in a health facility compared with 40% of women who had fewer than four ANC visits and delivered in a health facility. Even for women who made at least one ANC visit during pregnancy, whether in a public or private facility, they were most likely to be delivered by an SBA, which usually takes place in a health facility (Idowu et al., 2017). More specifically, Fagbamigbe et al. (2017) inferred that if a woman adequately used ANC, she was five times more likely to use SBA in health facilities than those who did not attend ANC. This relationship is not always the case, as was observed in Yifru and Asres's (2014) systematic review using a meta-analysis. Using this methodology, the researchers carried out a comparative analysis between women who had at least one ANC visit and those who had health facility delivery in 22 sub-Saharan African countries, including Nigeria. The results indicated that while ANC attendance increased institutional delivery chances by seven times, the gap between these two outcomes was as much as 50% (Yifru & Asres, 2014).

This difference pointed out that other factors are barriers to having health facility delivery despite attending ANC. Because obstetric care is a continuum of care from conception to postpartum care, the odds are higher for pregnant women enrolled in ANC in a health institution to continue to and have their delivery than those who never were enrolled. Nevertheless, it will also depend on the health service factors such as the distance to a health facility, cost of services, quality of care, and type of health facility, and this the focus in the next section.

Health Service Factors

One way to view health service factors broadly and with ANC and delivery services is from the lens of access. The term access can be from a physical perspective for factors of distance from health facility and type of facility, or a functional perspective for aspects such as cost of services, quality of care, and acceptance. In most cases, these factors contribute to delays in the utilization of health services, and, in some instances, it leads to nonutilization, as shown in Figure 1.

Figure 1

Factors That Determine the Use of Maternal Services
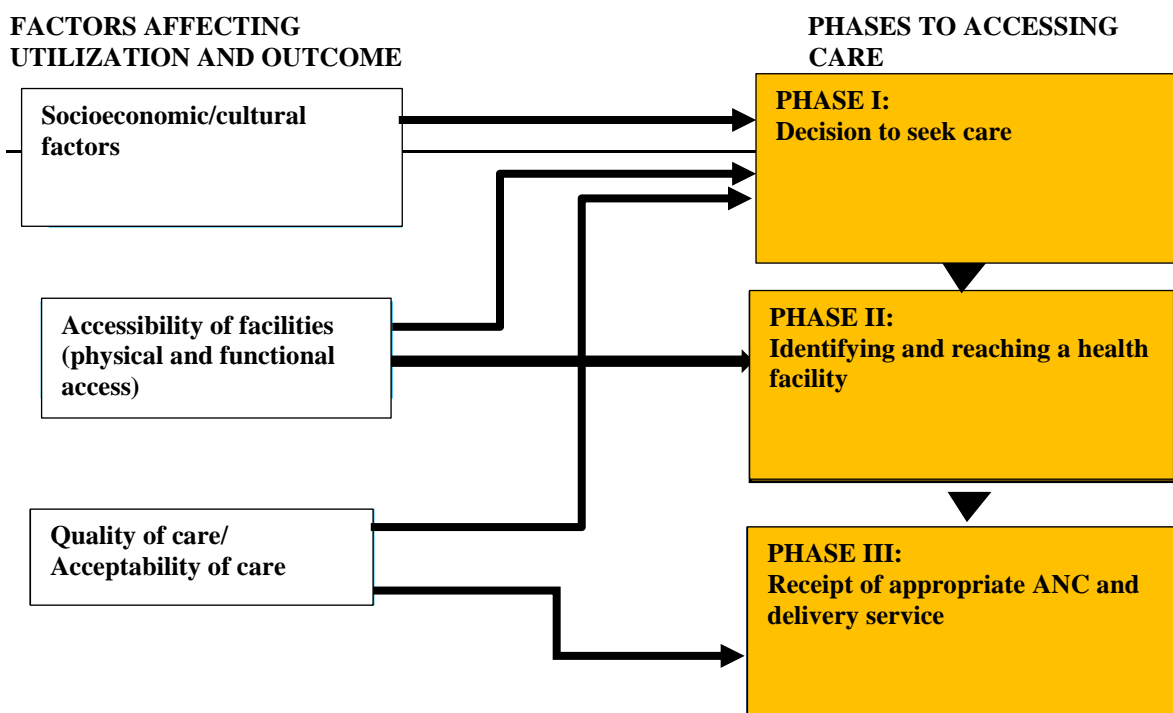
Note. Adapted from *Setting Standards for Emergency Obstetric and Newborn Care*, by United Nations Population Fund, 2019 (https://www.unfpa.org/resources/setting-standards-emergency-obstetric-and-newborn-care). In the public domain.

Distance from Health Facility

The proximity or otherwise to the closest health facility will influence the decision to visit the facility for any service, especially when other non-orthodox options are available. UNFPA (2014) recognizes that one of the delays contributing to complications during pregnancy is between the home and the health facility. Consequently, women's ability to readily access health facilities in a short time would motivate health facility delivery such that if women were within 10-30 minutes walking distance from the health facility, they are more likely to have health facility delivery (Olowookere et al., 2017). Even when other conditions are favorable, and the distance is unfavorable to a pregnant woman in labor, the evidence suggests that such a woman may most likely choose home delivery since they may not make it to the facility in good time to purchase the needed care.

Cost of Services

As with every purchase of goods and services, cost plays a critical role in the willingness to pay for health services at a perceived value. Many inputs are involved in healthcare provision, such as training and payment for health workers, drugs, and other consumables, the cost of deploying and maintaining hi-tech equipment, amongst others. All these variables together will result in a considerably high production cost that will be borne by the end-user, subsidized by a funding mechanism or insurance. In Nigeria, out-of-pocket payment is usually the assumption. However, with widespread maternal and child health programs, there have been attempts by governments of various states to subsidize these services.

Consequently, a Kaduna state-based study observed that all the women in a study population made at least one ANC visit because of the free maternal and child health (Idris et al., 2013). The observation is similar when the cost of care is borne by a third party or an insurance mechanism. It is such that even when only about 2.1% of respondents had health insurance coverage, it translated to 92% and 82% for the use of ANC and health facility for delivery in comparison with 52% and 37% for ANC utilization and health facility delivery respectively where there was no health insurance coverage (Dahiru & Oche, 2015). Putting it another way, if the cost of services is considered high, the odds of a pregnant woman having a delivery outside a health facility is 1.2 (Yaya et al., 2018). It follows that out-of-pocket payment for obstetric services discourages utilization, especially when disposable income is small, which may be the case for many families in Nigeria. On the demand side, the perceived cost of health care, affordability, and willingness to pay are considerations related to the cost of care and the decision to purchase care. On the supply side, any enabling factor that reduces the cost of supplying obstetric health services will encourage ANC utilization and institutional childbirth. However, such cost reduction should not compromise the perceived quality of care.

Quality of Care

Broadly, quality of care can be from both the perspective of the service provider and the end-user. The former will entail that service is provided according to defined or acceptable standards or references that are measurable. For ANC and delivery, this covers specific clinical examinations, laboratory investigations, and commodities, including

medications given to the clients (UNFPA, 2019). For the latter, despite these standards, the client's view of quality will include how the service delivery was appropriate and in an acceptable manner. Available evidence suggests that adherence to the minimum care package (quality of care) would positively predict pregnant women's retention to have institutional delivery. The minimum package includes components as essential as a blood pressure check, counseling on pregnancy and potential complications, blood and urine tests, and vaccination against tetanus during ANC (Chukwuma et al., 2017). More so, if the client has expressed satisfaction with previously received care from the same health facility, then the use of ANC and place of delivery is significantly associated with the level of satisfaction with services (Chukwuma et al., 2017; Emelumadu et al., 2014; Nwankwo et al., 2019). Another element of quality of care of note has to do with culturally acceptable processes. One of the barriers to the use of ANC and, more importantly, institutional delivery by pregnant women in a conservative Kano state is the perceived lack of privacy and insufficient female health workers, which makes women choose home deliveries (Abubakar et al., 2017; Idris et al., 2013). Having established that the quality of care cannot be only from the adherence of a service provider to the minimum standard for any given service, it would be useful to get feedback from clients' perspectives to ensure that it meets the socio-cultural expectations. Such feedback, if addressed, will ensure more retention for ANC and institutional deliveries. Furthermore, for health institutions, the type of institution is a factor to consider regarding the quality and cost of care.

Type of Health Facility

Having stated that one of the motivations for ensuring quality service by a health provider is to ensure patronage and adherence by clients, another motivation is profit. The latter is typically the case for privately owned health facilities as different from government-owned (public) facilities. It then follows that the factors of cost, quality of service (including quantity and quality of staff and technology) can vary depending on whether a health facility is publicly or privately owned. While there are limited published data on health facility deliveries in Nigeria, a study by Wong et al. (2018) using a secondary analysis of the 2013 NDHS observed that there was 37.4% health facility delivery across the country, with 23.8% and 13.6% occurring in public and private facilities, respectively. Generally, the choice to use either a public or private health facility for ANC or childbirth depends on the interaction of factors, including proximity, health service factors (cost and quality), and sociodemographic factors. The study by Wong et al. inferred that the preponderance of a cluster of private facilities in a community that has many poor households limits their ability of pregnant women to have institutional delivery.

The conclusion by Wong et al. (2018) was based on the assumption that private health facilities are relatively more expensive than public ones of a similar care level. Having a more significant proportion of private health providers than public health facilities in Lagos State provides the impetus for this study to understand the interacting factors influencing the utilization of ANC services and locations for childbirth. Of additional interest is understanding the role private health providers play in the gap

between the proportion of women who use ANC service and those who have institutional delivery.

Summary of Literature Review

The literature review was according to three broad themes, socio-demographics, obstetric factors, and health service factors. The sociodemographic factors reviewed were age, education of the women and their spouses, household wealth status, and place of residence. All these factors were associated to varying degrees with the use of ANC and institutional delivery. Obstetric factors, the second theme comprises parity and the use of ANC. Generally, women with in-between parity are more likely to use ANC and institutional delivery than those at both extremes. Similarly, pregnant women who have used ANC were more likely to have delivery in a health facility, but this observation is not absolute and not very linear. All the sub-themes for health service factors, the distance from a health facility, cost of services, quality of care, and type of health facility, are associated with the use of ANC and institutional delivery.

A gap in the literature is that pregnant women would attend ANC but will not have an institutional delivery, and this study will seek to address the gap. Additionally, there are limited studies to determine the effect that private health preponderance has on pregnant women's decision to have institutional delivery. The methodology, described in more detail in Chapter 3, was used to investigate the identified social and research problems to contribute to the body of knowledge.

Chapter 3: Research Method

Introduction

The purpose of this study was to investigate the factors that influence the use or nonutilization of health facilities by pregnant women in Lagos, Nigeria, for deliveries. I applied logistical regression to establish the association between the determinants and the locations where the women gave birth. In this chapter, I provide details on the research design, methodology, and treatment of threats to validity.

Research Design and Rationale

I used a cross-sectional design to determine the associations between the identified independent variables and the outcome of interest, which was the place of childbirth by pregnant women in Lagos, Nigeria. A significant reason for the study design is because an existing 2018 NDHS secondary data was the data source. The design was also relatively inexpensive and easy to conduct and could be used to estimate the place of childbirth, and, with an appropriate sample size of the target population, the findings can be generalized (Walden, n.d.; Wang & Cheng, 2020). Furthermore, both independent and outcome variables are available simultaneously, and there is no attrition (Frankfort-Nachmias et al., 2015). A cross sectional design with primary data collection and a qualitative design were the other considerations. But I chose this design because not much research has been done specifically where private health facilities are the predominant providers, and there was already an existing globally acceptable secondary dataset.

Methodology

Population

The study population was women of reproductive age (15-49 years) in Lagos

State, Nigeria. This population group varies in proportion from one location to another

depending on the setting (urban or rural), and other considerations. I determined the

sample size to represent the study population so that the findings can be generalizable. In

Nigeria, this subgroup accounts for 25% of the total population (National Population

Commission, 2010). Moreover, being secondary data, this population already had

identifier codes and was readily filtered. The rationale for considering this population is

that women of reproductive age, rather than men, are the primary group of persons who

get pregnant and, thus, can s the study population, and the specific women questionnaire

was administered to only this group.

Sample Size

Women of reproductive age group (15-49 years) are most likely to become

pregnant and have discussions on prenatal and delivery, which was the focus of the study.

Although a few other females outside the age group have children, they are mostly

outliers. The calculation of the sample size for the logistic regression depended on the

predictors or independent variables known to influence the place of childbirth. These

predictors could either be continuous or dichotomous and determine the type of approach

used to calculate the sample size. Age was the only continuous independent variable I

considered for estimating sample size but did not use for some reasons. First, there is no

precise cut-off age for women to begin childbearing. Secondly, researchers whose articles

I studied have shifted from treating the study population's ages as a continuous variable to categorical age groups (Dahiru & Oche, 2015; Ononokpono, & Odimegwu, 2014). Therefore, I applied the dichotomous variable option to calculate the sample size using the G*Power statistical program. The predictor variable used to calculate the sample size was household wealth status; in Lagos State, 67% of households lived below the poverty line in 2013 (Lagos Bureau of Statistics, 2014). Using G*Power, the odds ratio was determined to be 4.12. Also, the probability of noninstitutional delivery (Y = 1) when a woman is not from a poor household (Prob(Y = 1 | X = 1) Ho) was determined to be 0.33. I imputed other parameters for the sample size calculation: two tails hypothesis testing, a significance level of 5%, and the desired power of 80%. Because the outcome of interest is behavioral, the assumption was that the covariates would be strongly associated, so the squared multiple correlation coefficient (R2) was estimated to be 0.81.

Another assumption was that more women are poor (X param $\prod$ = 0.6). After selecting the binomial distribution, the sample size derived from G*Power analysis was 378. Because of the potential for missing data from a secondary data source, which simulates nonresponse and a potential reduction in the expected minimum sample size (Ayilara *et al*., 2019), there would have been the necessity to carry out sample weighting where there is adequate information. However, with the small volume of missing data, there was no need to apply methods for handling missing data such as multiple imputations and full-information maximum likelihood.

Operationalization of the Variables

I classified the variables into the independent (exposure) variables and the

dependent (outcome) variables. The independent variables included sociodemographic

factors (age, educational status, wealth status, marital status, place of residence), obstetric

factors (parity, number of children, use of ANC), and health service factors (the type of

facility, distance from home, cost of services, quality of care). The dependent variable

was the place of delivery (health facility and nonhealth facility).

Procedures for Data Collection

Upon receipt of IRB approval (approval number 10-19-20-0415160), I obtained

the secondary data on request from the National Population Commission in Nigeria for

the recently concluded 2018 NDHS. The secondary data are government-owned and in

the public domain; an online request was the requirement to gain approval to use for

research purposes. Three questionnaires are used in the NDHS: the Household

Questionnaire, the Woman's Questionnaire, and the Man's Questionnaire. These tools are

adaptations from the MEASURE NDHS program's model questionnaires to suit each

country's requirements following extensive consultations. The Woman's Questionnaire

was the tool administered to women aged 15-49 years. The questions cover the following

areas: background characteristics (age, religion, education, literacy, media exposure,

amongst others); reproductive history and childhood mortality; knowledge source and use

of family planning methods; fertility preferences; antenatal, delivery, and postnatal care;

breastfeeding and infant feeding practices; child immunization and childhood illnesses;

marriage and sexual activity; women's work and husbands' background characteristics;

malaria prevention and treatment; women's decision-making; awareness of AIDS and other sexually transmitted infections; maternal mortality; and experience of domestic violence. The secondary data set for this study was the women section of the 2018 NDHS.

Data Analysis Plan

The data analysis plan focused on data transformation before the actual data analysis. I used the SPSS package, which I obtained from Walden University, for data analysis because it is readily acceptable, compatible, and robust. The analysis included both descriptive and inferential statistical analysis. The descriptive statistics involved the presentation of findings as counts (frequencies) and percentages. Because most of the variables were categorical, I opted not to include analysis of central tendency (mean, mode, and median) and dispersion (standard deviation and variance). The preferred inferential statistics used to analyze the cause-effect associations was logistic regression. I present the results using the test of the odds ratio and the 95% confidence interval. The details of the analysis and data management are discussed in Chapter 4.

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Threats to Validity

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Because I used secondary data sets, the concern of validity was whether the data could measure the right concepts to answer the RQs. Specifically, content validity was the issue of concern. To minimize the potential content validity errors, scale items were retained as much as possible rather than the use of transformed variables in the data sets. All the categorical variables were globally accepted standardized variables with standardized definitions.

Ethical Considerations

I obtained approval to conduct the study from the Walden IRB. This approval protects me as the researcher and also validates the integrity of the secondary data. Even though the secondary data had most of the information anonymized, I followed ethical principles of handling data, such as using passwords and appropriate codes to maintain privacy and confidentiality.

<div align="center">

Summary

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The study design was a cross-sectional type to determine the associations between the sociodemographic, obstetric, and health service factors and the place of childbirth by pregnant women in Lagos, Nigeria. The study population were women of reproductive age group, aged 15-49 years. I analyzed data from the existing 2018 NDHS secondary data after the receipt of IRB approval. I carried out preparatory data analysis and appropriate data transformation. Actual data analysis was performed using both descriptive and inferential statistics, and the findings, shown in tables, charts, and narrative format, will be presented in Chapter 4.

Chapter 4: Results

In this study, I investigated the factors that influence the use or nonuse of health facilities by pregnant women in Lagos, Nigeria, for deliveries using secondary data from the NDHS. In this chapter, the secondary data analysis results, including data management and deviations from the data analysis plan presented in Chapter 3, are described. Also, this chapter shows descriptive statistics of the sample using all the relevant and available variables and the logistic regression results. I present the results of each RQ and hypothesis using tables and narratives. Importantly, I emphasize the statistical assumptions in the narrative.

Data Collection and Data Management

I obtained the 2018 NDHS from the NDHS website after submitting a request and following approval from the Walden University IRB. The SPSS version of the Nigeria NDHS 2018 was downloaded as compressed zip files from the available data set formats. The data set used to address the RQs was NGBR7AFL. The data set is the individual recode. It has one record for every eligible woman as defined by the household schedule containing all the data collected in the women's questionnaire and household questionnaire variables.

I used the individual recode data set for the analysis. The data set contained 41,821 observations. This data set has one record for every eligible woman and contains all the data collected in the women's questionnaire and some household variables. The data set includes data on pregnancy, postnatal care, immunization, and health for up to 20 births in the birth history and up to six children under 5 years. The data set for women

from Lagos State whose most recent childbirth was within the last 5 years from the date

of the survey interview was filtered, resulting in a sample of 598 women. Tables 1 and 2

show the variables selected for the analysis and those in the NDHS recode data sets. As

part of the attempts to quality assure the data set for analysis, I analyzed missing data

using the missing value analysis command in SPSS. The only quantitative variable was

the respondent's current age, with the rest being qualitative variables.

Table 2

Variables Selected From the Individual Recode Data Set

Variable	Variable label
M15	Place of delivery
V012	Respondent's current age
V106	Highest educational level
V501	Current marital status
V190	Wealth factor score
V191	Wealth factor score
V025	Place of residence
V201	Total children ever born
V218	Number of living children
M2N_1	Prenatal: no one
M14_1	Number of antenatal visits during pregnancy
M57A_1	Antenatal care: respondent's home
M57B_1	Antenatal care: other home
M57E_1	Antenatal care: government hospital
M57F_1	Antenatal care: government health center
M57G_1	Antenatal care: government health post
M57H_1	Antenatal care: other public sector
M57M_1	Antenatal care: private hospital/clinic
M57N_1	Antenatal care: other private medical
M57X_1	Antenatal care: other
V467C	Getting medical help for self: getting money needed for treatment
V467D	Getting medical help for self: distance to health facility
V481	Covered by health insurance
M1_1	Number of tetanus injections before birth
M42C_1	During pregnancy: blood pressure taken
M42D_1	During pregnancy: urine sample taken
M42E_1	During pregnancy: blood sample taken
M49A_1	During pregnancy took: SP/fansidar for malaria

I calculated quality of ANC by assigning a score of 0/1 to each of M1_1, M42C_1, M42D_1, M42E_1, M49A_1 if absent/present and summing. A total score of 5 indicated an adequate quality of ANC, meaning the woman got all the services while < 5 was "inadequate quality." Variables where the response was missing or *don't know* received a score of 0, which is the same as if the woman did not receive the service.

Table 3

Study Variables Present in the NDHS Recode Data Sets

Survey data set	Variable in data set	Variable name
Independent variable		
	v012	Respondent's current age
	v013	Age in 5-year groups
	v106	Educational status of women
	v701	Education status of husband/partner
	V190	Wealth status (wealth index combined)
	v025	Place of residence (type of place of residence)
	V201	Parity (total children ever born)
	V218	Number of children (number of living children)
	m2n/m14	Use of ANC at a public or private facility (prenatal care / no of antenatal visits)
	m57a:m57k	The type of facility (where antenatal care took place)
	v467d	Distance from residence (distance to health facility)
	v467c	Cost of services (getting money needed for treatment)
	v481	Covered by health insurance
Dependent variable		
	m15	Place of delivery
Other need variables	v001	Cluster number
	v002	Household number
	v005	Individual sample weight

Data Analysis

The statistical analysis software I used for data cleaning, recoding of variables, and data analysis was SPSS. The first step in the analysis was to examine the characteristics of the variables through a descriptive statistic by generating frequency tables. This step also provided the opportunity to review the data set for missing data, for which there was no need for correction. For the inferential statistics, the analysis was conducted systematically to answer the three RQs. For each question, I used binary logistic regression to determine how the independent cluster of factors in the hypothesis predicted the dependent variable (place of delivery by pregnant women). A full logistic regression model including all covariates was fitted into the logistic regression by modeling all the factors with the single dependent variable. Each of the independent categorical variables was referenced or coded to identify the response levels that precisely predict the outcome.

For RQ1, the cluster of independent variables labeled sociodemographic factors contained the following component variables: age (recoded to age group), highest educational level, marital status, wealth index, and place of residence. After inputting all the sociodemographic predictors, I conducted two logistic regression models; the first was irrespective of ANC attendance, while for the second, I controlled for ANC attendance. In the case of RQ2, the cluster of obstetric factors contained the following variables: parity, number of children, number of antenatal visits, and place of ANC. These variables were used to predict the place of delivery through the logistic regression statistics, without and with adjustment for ANC attendance. A similar analysis was

conducted using health service factors (distance to a health facility, cost of services, health insurance, and quality of ANC) to predict the place of delivery to answer RQ3. This also included controlling for ANC attendance. The final logistic regression model was the inclusion of all the covariates comprised of sociodemographic factors, obstetric factors, and health service factors to determine how these interactions predict the place of delivery by pregnant women.

<div align="center">**Results**</div>

Characteristics of the Study Sample

The mean age of the women in the study sample was 32 years ± 6 (*SD)*. Table 4 summarizes the other characteristics of the study sample. Regarding sociodemographic factors, nearly a third of the women were in the 30 to 34 years age group, and over 50% had completed secondary (high school) education. The majority (91.5%) of the study population were married, and most (93.6%) lived in urban Lagos. The wealth index was evenly distributed among the study population, from the poorest to the richest. For obstetric parameters, about 50% of the women had given birth to two to three children. For their most recent pregnancy, 96% attended ANC, of which 92.6% visited ANC four times or more. For health service factors, only 5.4% had medical insurance, but the cost of care (including ANC) was affordable for 74% of the women.

Regarding distance to a health facility, 88% of the respondents expressed satisfaction with the proximity. About 55% of the study population attested to having received essential ANC services. When it comes to delivery (dependent variable), 19.2%

did not have their deliveries in a health facility but rather at home. Another 6.4% had

their deliveries in places other than a health facility or home.

Table 4

Characteristics of the Study Sample

Variable	Frequency (%)
Mother's age group (years)	
< 25	63 (10.6)
25-29	139 (23.2)
30-34	189 (31.6)
35-39	143 (23.9)
40+	64 (10.7)
Mother's education	
No education	28 (4.7)
Primary	61 (10.2)
Secondary	319 (53.3)
Higher	190 (31.8)
Husband educational status	
No education	20 (3.7)
Primary	31 (5.7)
Secondary	269 (49.2)
Higher	213 (38.9)
Don't know	14 (2.6)
Household wealth index	
Poorest	120 (20.1)
Poorer	119 (19.9)
Middle	120 (20.1)
Richer	119 (19.9)
Richest	120 (20.1)
Place of residence	
Urban	560 (93.6)
Rural	38 (6.3)
Parity	
1	140 (23.4)
2-3	295 (49.3)
4 +	163 (27.3)
Number of children	
1	153 (29.6)
2-3	300 (50.2)
4 +	145 (24.2)
Used antenatal care (ANC)	
No	24 (4)
Yes	574 (96)
Number of ANC visits	
0	24 (4.7)
1-3	14 (2.7)
4+	475 (92.6)

(table continues)

Variable	Frequency (%)
Place of ANC	
No ANC	24 (4.0)
Home	49 (8.2)
Public facility	245 (41.0)
Private facility	270 (45.2)
Other	10 (1.7)
Distance to a health facility	
Big problem	71 (11.9)
No problem	527 (88.1)
Money needed for health care	
Big problem	154 (25.7)
No problem	444 (74.2)
Insurance cover	
No	566 (94.6)
Yes	32 (5.4)
Quality of ANC (basic services)	
Yes	327 (54.7)
No	271 (45.3)
Health facility delivery	
No	115 (19.2)
Yes	483 (80.8)
Place of delivery	
Home	115 (19.2)
Public facility	160 (26.8)
Private sector	285 (47.7)
Other	38 (6.4)

Research Question 1

Is there an association between sociodemographic factors (age, educational status of women and their husbands, wealth status, place of residence) and the place of delivery used by pregnant women in Lagos State?

$H_0$1: There is no significant association between sociodemographic factors and the place of delivery used by pregnant women in Lagos State.

H_a1: There is a significant association between sociodemographic factors and the place of delivery used by pregnant women in Lagos State.

Table 5 shows the logistic regression carried out to answer RQ1. The predictor is composed of identified sociodemographic covariables, while the dependent variable is the place of delivery. There was no adjustment for the women attending ANC in the first model, while for the second model, I adjusted for ANC attendance. The rationale for adjusting for ANC attendance in the second model was to account for the gap between pregnant women who attended ANC but did not have health facility delivery and compare with the first model for all pregnant women irrespective of ANC attendance. In both models, the women's educational level and their wealth index were the predictors of the place of delivery. In Model 1, having a secondary education significantly increases the odds of health facility delivery by 3.5 [95% CI: 1.32, 9.10], and having a beyond high school education significantly increases the odds of institutional delivery by 6.0 [95% CI: 1.85, 19.20]. In Model 2, only higher education is the significant predictor ($p = .040$), increasing the health facility delivery odds by 3.7 [95% CI: 1.10, 13.1]. Primary education slightly increases the odds of health facility delivery by 1.5 [95% CI: .5, 4.4] in

Model 1, but it is not statistically significant. With adjustment for ANC attendance

(Model 2), having primary education does not increase institutional delivery.

      The wealth index is a statistically significant predictor for the health facility

delivery in Model 1 ($p = .044$) and model 2 ($p = .042$). From the middle to the richest

wealth index, the odds range between 1.3 and 2.2 for health facility delivery for both

models, but none of the levels is statistically significant.

Table 5

Logistic Regression: Sociodemographic Predictors of Place of Delivery

Variable	p-value	OR	95% CI LL	95% CI UL	p-value	OR	95% CI LL	95% CI UL
			Model 1				**Model 2***	
Age groups [a]	.712				.764			
25-29 (1)	.876	.935	.399	2.189	.795	.892	.375	2.118
30-34 (2)	.874	.935	.405	2.158	.841	.916	.391	2.150
35-39 (3)	.420	1.443	.592	3.518	.501	1.367	.550	3.400
40+ (4)	.777	1.160	.414	3.249	.863	1.097	.382	3.152
Highest educational level [b]	.006				.037			
Primary (1)	.421	1.539	.538	4.398	.972	1.021	.327	3.189
Secondary (2)	.012	3.463	1.318	9.100	.135	2.246	.778	6.488
Higher (3)	.003	5.972	1.855	19.227	.040	3.729	1.060	13.121
Husband educational level [b]	.594				.549			
Primary (1)	.523	1.570	.394	6.252	.436	1.766	.422	7.382
Secondary (2)	.834	1.125	.374	3.385	.910	1.067	.344	3.308
Higher (3)	.661	1.308	.394	4.342	.711	1.262	.368	4.324
Don't know (4)	.388	.503	.106	2.392	.393	.496	.099	2.483
Wealth index [d]	.044				.042			
Poorer	.349	.721	.364	1.430	.437	.760	.380	1.519
Middle	.101	1.968	.876	4.420	.073	2.110	.932	4.778
Richer	.516	1.291	.597	2.789	.425	1.375	.629	3.008
Richest	.128	2.093	.808	5.418	.110	2.184	.838	5.692
Place of residence								
Rural [e]	.658	.811	.321	2.050	.959	.975	.368	2.581
Had antenatal care [f] (1)					.004	5.081	1.705	15.145
Constant	.863	.893			.115	.290		
Nagelkerke R^2		.155				.178		

Note. OR = odds ratio; CI = confidence interval; *LL* = lower limit; *UL* = upper limit; *=adjusted for ANC attendance; [a] reference level = <25 years; [b] reference level = No education; [c] reference level = Single; [d] reference level = poorest; [e] reference level = Urban; [f] reference level = No ANC.

Research Question 2

Is there an association between obstetric factors (parity, number of children, use of ANC) and the place of delivery used by pregnant women in Lagos State for delivery?

$H_0 2$: There is no significant association between obstetric factors and the place of delivery used by pregnant women in Lagos State.

$H_a 2$: There is a significant association between obstetric factors and the place of delivery used by pregnant women in Lagos State.

The logistic regression statistic to show the association between obstetric factors and the place of delivery is shown in Table 6. Of the covariates in the model, the number of ANC visits and ANC attendance are the factors that are significantly associated with the place of delivery. The parity and number of children are not statistically significantly associated with the place of delivery.

For the number of ANC visits, attendance of between 1 to 3 times is associated with the odds of 1.3 [95% CI: .3, 5.2] of having a health facility delivery compared to non-attendance of ANC. This is not statistically significant (p = .692). The odds increase to a much as 9.0 [95% CI: 3.7, 22.2] for health facility delivery when the pregnant attended ANC four or more times, which is statistically significant (p = .000). When ANC attendance was included in Model 4, the odds of health facility delivery was 9.0 [95% CI: 3.7, 22.2] if a woman attended ANC, whereas the odds of the association of the number of ANC visits with health facility was found to be .15 [95% CI: .05, .44], but the association was significant (p=.001). Being that ANC attendance, if it was less than four visits (OR = 1.3[95% CI: .3, 5.2]), did not significantly predict health facility delivery, it

is likely that the association of ANC with health facility delivery is mediated through the number of ANC attendance.

Regarding the parity, women with more than one decrease the odds of health facility delivery. A woman with a four and above parity was 60% less likely to have a facility delivery, OR = .4 [95% CI: .0, 2.8], while a woman having parity of two to three was 30% less likely to have institutional delivery, OR = .7 [95% CI: .15, 3.7]. These associations were not statistically significant. Unlike parity, as the number of children increases beyond one, the odds of health facility delivery increase. For a woman with two or three children, OR = 1.1 [95% CI: .2, 5.5] and if a woman had four or more children, the OR = 1.3 [95% CI: .2, 9.3]. Both associations were not statistically significant.

Table 6

Logistic Regression: Obstetrics Predictors of Place of Delivery

Variable	Model 3				Model 4[*]			
	p-value	OR	95% CI		p-value	OR	95% CI	
			LL	*UL*			*LL*	*UL*
Parity [g]	.530				.530			
2-3 (1)	.725	.750	.151	3.732	.725	.750	.151	3.732
4+ (2)	.358	.392	.053	2.893	.358	.392	.053	2.893
Number of children [h]	.967				.967			
2-3 (1)	.862	1.148	.241	5.460	.862	1.148	.241	5.460
4+ (2)	.798	1.295	.179	9.351	.798	1.295	.179	9.351
Number of ANC visits [i]	.000				.001			
1-3 (1)	.692	1.320	.334	5.222				
4+ (2)	.000	9.028	3.672	22.195	.001	.146	.049	.438
Had ANC[j]					.000	9.028	3.672	22.195
Constant	.540	.739			.540	.739		
Nagelkerke R^2		.128				.128		

Note. OR = odds ratio; CI = confidence interval; *LL* = lower limit; *UL* = upper limit; *=ANC attendance in the model; [g] reference level = 1; [h] reference level = 1; [i] reference level = No ANC; [j] reference level = No ANC.

Research Question 3

Is there an association between health service factors (the type of facility, distance from residence, cost of services, quality of care) and the place of delivery used by pregnant women in Lagos State?

$H_0$3 There is no significant association between health service factors and the place of delivery used by pregnant women in Lagos State.

H_a3: There is a significant association between health service factors and the place of delivery used by pregnant women in Lagos State.

The logistic regression models to answer RQ 3 are presented in Table 7, which uses the five independent health service variables to predict the place of delivery by pregnant women.

The observations are the same in both models. Having health insurance puts the odds of institutional delivery at 1.4 [95% CI: .4, 5.7], but this is not statistically significant. The cost of health care is the next predictor of interest. Not having a problem with healthcare costs puts the odds of delivering at a health facility at 1.8 [95% CI: 1, 3.3] but was not statistically significant. Ironically, if the distance to a health facility was not a problem, the women were 17% less likely to deliver in a health facility, OR = .83 [95% CI: .4, 1.9] was not statistically significant. Having good quality ANC statistically significantly (p = .005) predicts health facility delivery with the odds ratio of 2.2 [95% CI: 1.3, 3.8]. The place of ANC attendance is the strongest health service factor for health facility delivery (.000). If a woman had ANC at a public facility, the odds of a health facility delivery was 6.4 [95% CI: 2.3,18], the odds become 11.7 [95% CI: 4.1,33] if a

woman had ANC at a private facility, and odds increases to 15.3 [95% CI: 1.6, 146] if

ANC was in some other place. All three associations were statistically significant.

Table 7

Logistic Regression: Health Service Predictors of Place of Delivery

	Model 5				Model 6[*]			
	p-value	OR	95% CI		p-value	OR	95% CI	
Variable			*LL*	*UL*			*LL*	*UL*
Health insurance [k]								
Yes (1)	.594	1.451	.369	5.702	.594	1.451	.369	5.702
Cost of health care [l]								
No problem (1)	.052	1.806	.995	3.279	.052	1.806	.995	3.279
Distance to health facility [m]								
No problem (1)	.654	.828	.362	1.894	.654	.828	.362	1.894
Good quality ANC [n]								
Yes (1)	.005	2.220	1.279	3.855	.005	2.220	1.279	3.855
Place of ANC [j]	.000				.000			
Home	.024	.246	.073	.831	.024	.246	.073	.831
Public facility	.000	6.442	2.319	17.896	.000	6.442	2.319	17.896
Private facility	.000	11.659	4.114	33.038	.000	11.659	4.114	33.038
Other	.018	15.309	1.608	145.764	.018	15.309	1.608	145.764
Constant	.097	.442			.097	.442		
Nagelkerke R^2		.397				.397		

Note. OR = odds ratio; CI = confidence interval; *LL* = lower limit; *UL* = upper limit; *=adjusted for ANC attendance; [k] reference level = No; [l] reference level = Big problem; [m] reference level = Big problem; [n] reference level = No.

Full Model With All Sociodemographic, Obstetric, and Health Service Factors

After the regression models for the sociodemographic, obstetric, and health service factors addressed the three RQs, I conducted further analysis to predict the place of delivery by the interaction of all the factors.

In Model 7, all the variables were included in the regression. I found that no sociodemographic variable significantly predicts the place of delivery. The first predictor in the model is the number of ANC visits by women during their pregnancy. Pregnant women who make four or more ANC visits put the odds of heath facility delivery at 16 [95% CI: 1.4, 194.4], which was statistically significant (p = .026). The second predictor in model 7 is the place of ANC attendance. The analysis showed that having ANC at home is almost as though there was no ANC attendance, with an odds ratio of .009 [95% CI: .0, .1] and was also statistically significant (p = .000).

For Model 8, the number of ANC attendance and the place of ANC were the statistically significant predictors. Making four or more ANC visits has an odds ratio of 20.3 [95% CI: 2, 204]. Similar to Model 7, ANC attendance at home had an odds ratio of .013 [95% CI: .0, .1], making it a strong predictor of the place of delivery.

Table 8

Logistic Regression: Sociodemographic, Obstetrics, and Health Service Predictors of Place of Delivery

Variable	Model 7**				Model 8***			
	p-value	OR	95% CI		p-value	OR	95% CI	
			LL	UL			LL	UL
Age groups	.437							
25-29 (1)	.437	1.576	.500	4.974				
30-34 (2)	.295	1.854	.585	5.880				
35-39 (3)	.065	3.506	.926	13.280				
40+ (4)	.300	2.187	.497	9.616				
Highest educational level	.853				.532			
Primary (1)	.937	1.069	.203	5.648	.903	.920	.239	3.536
Secondary (2)	.629	1.445	.324	6.445	.631	1.352	.395	4.625
Higher (3)	.496	1.819	.325	10.187	.324	2.025	.499	8.226
Husband educational level	.265							
Primary (1)	.253	2.773	.482	15.967				
Secondary (2)	.427	1.749	.441	6.943				
Higher (3)	.838	1.168	.264	5.166				
Don't know (4)	.275	.292	.032	2.661				
Wealth index	.253				.305			
Poorer	.300	.593	.220	1.595	.141	.536	.234	1.230
Middle	.298	1.777	.602	5.244	.629	1.257	.497	3.182
Richer	.765	1.176	.406	3.413	.968	1.020	.391	2.660
Richest	.600	1.397	.400	4.884	.789	1.161	.388	3.472
Place of residence								
Rural	.646	1.397	.336	5.810				
Parity	.158							
2-3 (1)	.723	1.621	.112	23.442				
4+ (2)	.514	.354	.016	8.005				
Number of children	.504							
2-3 (1)	.697	.600	.046	7.810				
4+ (2)	.808	1.448	.073	28.637				
Number of ANC visits	.001				.001			
1-3 (1)	.768	1.539	.088	26.938	.425	2.931	.208	41.245
4+ (2)	.026	16.489	1.399	194.362	.010	20.348	2.025	204.479
Place of ANC	.000				.000			
Home	.000	.009	.001	.103	.000	.013	.001	.127
Public facility	.595	.542	.057	5.179	.490	.465	.053	4.105
Private facility	.827	.774	.078	7.635	.801	.753	.083	6.852

(table continues)

Variable	Model 7**				Model 8***			
	p-value	OR	95% CI		p-value	OR	95% CI	
			LL	UL			LL	UL
Health Insurance								
Yes (1)	.446	1.907	.363	10.014				
Cost of health care								
No problem (1)	.290	1.536	.694	3.402	.393	1.325	.695	2.528
Distance to a health facility								
No problem (1)	.184	.478	.160	1.423				
Good quality ANC								
Yes (1)	.721	1.141	.553	2.355	.415	1.312	.682	2.525
Constant	.186	.300			.211	.462		
Nagelkerke R^2		.473				.450		

Note. OR = odds ratio; CI = confidence interval; *LL* = lower limit; *UL* = upper limit; **=All variables; ***=Only the sociodemographic, obstetric and health service predictors that were statistically significant.

Summary

A logistic regression analysis was conducted on the secondary data from the 2018 Nigeria NDHS survey to investigate if sociodemographic, obstetric, and health service factors were associated with the place of delivery used by pregnant women in Lagos. Chapter 4 presented the results to answer each RQ and the corresponding hypothesis. I reported the odds ratio, the 95% confidence interval, and the p-value based on the α of .05.

For RQ1, a woman with secondary education, OR = 3.5 [95% CI: 1.3, 9.1] and higher educational status, OR = 6.0 [95% CI: 1.8, 19.2] were statistically significant predictors of the place of delivery. Wealth index was also a statistically significant predictor for the health facility (p = .044), but none of the levels was significant. Ages from 35 years and above have higher odds of facility delivery, but the association was not

statistically significant. For RQ2, having four or more ANC attendance put the odds of institutional delivery at 9.2 [95% CI: 3.7, 22] and was statistically significant (p = .000). Parity and the number of children were the other obstetric factors that were not statistically significant predictors in the model. For RQ3, five covariates, namely, health insurance, cost of service provision, distance to a health facility, quality of ANC services, and place of ANC, were included in the model. Of these, the quality of care and the place of ANC were the statistically significant predictors. A full model that included all the socio-demographics, obstetrics, and health service factors showed four or more ANC visits, OR = 16.5 [95% CI: 1.4, 194.4], and the place where ANC was received (p = 000) were the statistically significant predictors of the places of delivery used by pregnant women.

Based on the results presented in this chapter. Chapter 5 will provide plausible interpretations while linking with the existing body of knowledge on the subject. The next chapter will highlight the strengths and limitations of the study before giving appropriate conclusions and recommendations. Finally, I discussed how the evidence generated will potentially affect positive social change.

Chapter 5: Discussion, Conclusions, and Recommendations

In this study, I set out to bridge the gap in the literature on the factors responsible for pregnant women's choice on whether to use health facilities for delivery in Lagos State, Nigeria. Additional gaps that the study addressed were how the use of ANC by pregnant women and the preponderance of private health facilities influence women's decision to use health facilities for their delivery. I used a cross-sectional design to determine whether identified sociodemographic, obstetric, and health service factors predicted the place of delivery by pregnant women. Additionally, I used the NDHS secondary data to answer a set of RQs. The independent variables in this study were a cluster of sociodemographic factors (age, educational status of women, wealth status, place of residence), obstetric factors (number of pregnancies, number of children, use of ANC), and health service factors (the type of facility, distance from residence, health insurance, cost of services, quality of care). The dependent variable was the place of delivery.

This study confirmed that a woman's wealth index and educational status are statistically significant sociodemographic predictors of the place of delivery, unlike age and place of residence. For obstetric factors, the study confirmed the number of ANC visits and where ANC was received as significant predictors of where women chose to give birth. For the third cluster, the health service factors, the quality of ANC, and cost of services were statistically significantly associated with the place of delivery. These results showed that effective ANC use, and where ANC services were received (including private facilities) influenced women's decision for institutional delivery.

Interpretation of the Findings

This study's premise was that maternal mortality is reduced when women deliver in a health facility and that certain sociodemographic, obstetric, and health service factors may be responsible for their decision.

Association Between Sociodemographic Factors and Place of Delivery

The sociodemographic factors identified for the analysis were the following: age, woman's educational status, husband's educational status, wealth status, and place of residence. I discuss the interpretation for each of these associations in the following sections.

Age

The results of my study showed that women between 35-39 years have higher odds, OR = 1.4 [CI: 6, 3.5], of delivering in a health facility than the younger age groups. The odds dropped to 1.2 [CI: .4, 3.2] for women 40 years and above. The finding slightly differs from the study by Dahiru and Oche (2015), who observed that the odds of institutional delivery increase for women aged 25 years and above. Egharevba et al. (2017) reported that, among women who used ANC, those between 20-29 years had a higher tendency to deliver in a health facility than younger women. From my study, after adjusting for ANC attendance, the higher odds, OR = 1.4 [CI: .5, 3.4], were still amongst women between 35-39 years. Although there is a similarity between this study and those mentioned that much younger women have lower odds of delivering in a hospital, the difference is in the cut-off age. However, as shown in this study and reported studies

(Fagbamigbe and Idemudia, 2015), age was not a statistically significant predictor of health facility delivery.

Wealth Status

I additionally confirmed that household wealth status, measured by the wealth index, is a predictor for pregnant women's health facility delivery, even though the statistical significance was not observed at any specific level. The middle wealth index had an OR = 2.0 [CI: .9, 4.4], and the richest wealth index had an OR = 2.0 [CI: .8, 5.4] for health facility delivery. Adedokun and Uthman (2019) found that women from poor households have 1.4 higher odds of not having an institutional delivery than wealthy households. The observation is consistent with Fasina et al. (2020), who found that poorer women through the middle to the wealthiest index had higher odds of institutional delivery compared to the lowest wealth index. Other researchers have suggested that women's employment status and economic empowerment compliments household wealth and such women with higher socioeconomic status were more likely to have health facility deliveries (Dahiru & Oche, 2015; Ononokpono, & Odimegwu, 2014).

Level of Women's Education

My study data showed that women having secondary and tertiary education statistically significantly increased the choice for a health facility delivery. With a secondary education, the odds of health facility delivery was observed to be 3.5 [95% CI: 1.32, 9.10], while those with tertiary education have the odds of 6.0 [95% CI: 1.85, 19.20]. The finding is consistent with results from Fawole and Adeoye (2015), who found that women with secondary or tertiary education were significantly more likely to have

institutional delivery than those with primary or no formal education. Other researchers have found that having a secondary or tertiary education influences women significantly by 2.5 times more to choose to give birth in a health facility (Egharevba et al., 2017; Fawole & Adeoye, 2015; Nwankwo et al., 2019).

Husbands' Education

My results showed that the husband's education level was not a statistically significant predictor for women giving birth in a health facility. For a husband with primary education, I found the OR =1.6 [CI: .4, 6.2] for a health facility delivery. And if the husband had a secondary education, the OR = 1.1 [CI: .4, 3.4] for a health facility delivery, which is not notably different than if they did not have a formal education. Furthermore, if the husband had tertiary education, the OR = 1.3 [CI: .4, 4.3] for institutional delivery. This observation is a variation from the finding of a previous study by Egharevba et al. (2017) that a husband with a tertiary education increases the odds by 36 that his pregnant wife will deliver in a health facility. The odds would become 12 times if he had primary education and four times if he had secondary education, indicating that the husband's education is a strong predictor for health facility delivery, contrary to this study.

Place of Residence

In this study, I found that despite the slightly lower likelihood for rural women, OR = .8 [CI: .3, 2], residence, whether rural or urban, does not significantly predict where pregnant women would give birth. This observation is consistent with other studies. Babalola (2014) observed that the odds of utilizing health facilities for delivery are lower

for rural women. Ononokpono and Odimegwu (2014) found 61% lower odds of delivering a baby in a health facility if a woman resided in a rural area, and it was statistically significant. However, when controlled for individual or household and community variables, the association was no longer significant. Adedokun and Uthman (2019) found that the odds of not using health facilities for deliveries were higher for women in rural areas because of the disadvantages they face due to inadequate access.

Association Between Obstetric Factors and Place of Delivery

I included the following variables in the model: the number of pregnancies, parity, ANC attendance, and the number of ANC visits. I did so to demonstrate the association between obstetric factors and the place of delivery. I discuss the interpretation for each of these associations in the following sections.

Parity

In this study, I found that parity above one decreases the odds of health facility delivery. A parity of four and above has OR = .4 [CI: .0, 2.8], while a parity of 2-3 has OR = .7 [.15, 3.7]. The findings of previous studies are varied regarding the relationship between parity and institutional deliveries. There is consistency with previous studies, which found that women with a parity of five or more were less likely to deliver in a health facility compared with women who have had 1-2 live births (Alfred et al., 2017; Ononokpono & Odimegwu, 2014). However, although other researchers found that a woman with parity of two to four was most likely to use health facilities for childbirth, I observed that women with a parity of two to three have lower health facility delivery odds.

Number of Children

I further found that as the number of children increases beyond one, the odds of health facility delivery increases. For a woman with two or three children, OR = 1.1 [CI: .2, 5.5] and if a woman had four or more children, the OR = 1.3 [CI: .2, 9.3]. The nonstatistically significant observation of this study is contrary to one that found that as the number of children increases, pregnant women's choice for institutional delivery decreases (Egharevba et al., 2017). Egharevba et al. (2017) observed that a woman with one child had a 3.9 times greater likelihood than those with five or more children to deliver in a health facility. Another study that paid specific attention to women's peculiarities in urban and rural areas found that an increasing number of children significantly predicted health facility delivery for the urban areas (Okafor et al., 2014). On the other hand, with an additional child for the rural residents, the likelihood of a nonhealth facility delivery was 1.4 (Okafor et al., 2014).

Use of ANC

My findings showed that when a pregnant woman attended ANC, the odds of health facility delivery was 9.0 [CI: 3.7, 22.2] compared to another woman who did not have ANC. A similar observation was the evidence by Idowu et al. (2017), who found that women who had at least one ANC visit during their pregnancy were most likely to be delivered by an SBA, which would usually be in a health facility. Another researcher found that the use of ANC increased the odds of health facility delivery by seven times but could not provide the reason for the gap by those who attended ANC but did not have institutional delivery, which was as much as 50% (Yifru & Asres, 2014). This brings up a

question regarding the efficiency of one antenatal visit being associated with health facility delivery.

Number of ANC Visits

Another perspective to the use of ANC is the number of ANC visits. For this study, the result showed that attending ANC between one to three times was associated with the odds of 1.3 [CI: .3, 5.2] for having a health facility delivery compared to nonattendance of ANC. This was not statistically significant ($p = .692$). For a pregnant woman having four or more ANC visits during her pregnancy, the odds increased to a much as 9.0 [CI: 3.7, 22.2] for health facility delivery, which was statistically significant ($p = .000$). The observation is congruent with other studies, such as Adedokun and Uthman (2019), who found that if a woman did not attend ANC, the odds of delivery outside a health facility was 5.3 times more than those who attended four or more ANC visits. Considering the adequacy of ANC in terms of the number of visits, Fagbamigbe et al. (2017) found that if a woman adequately used ANC, she was five times more likely to use SBA for delivery in comparison to those who did not attend ANC. Having at least four ANC visits is beneficial because the recommended minimum package of care covers targeted assessments and treatments, routine investigations and chemoprophylaxis, and, very importantly, health promotion, including health education/counseling, birth preparedness, and health service dissemination (Berhane et al., 2019). The reinforcement of health promotion sessions during ANC visits can improve awareness of health facility delivery.

Association Between Health Service Factors and Place of Delivery

The logistic regression model to determine the association of health service factors and the place of delivery included the following independent factors: cost of services, health insurance, distance to a health facility, quality of ANC, and place of ANC attendance. I discuss the interpretation for each of these associations in the following sections.

Cost of Services

For women who did not consider the cost of services as a challenge to accessing care, I found the odds of delivering at a health facility was 1.8 [CI: 1, 3.3] but was not statistically significant. Because health insurance as a funding mechanism reduces out-of-pocket cost, it is discussed under the cost of services. I further observed that women with health insurance have a slightly higher odds of 1.4 [CI: .4, 5.7] compared to those without insurance for institutional delivery. But this is not statistically significant. This finding is consistent with Dahiru and Oche (2015), who found that a woman with health insurance had a reduced cost of accessing ANC services. The perceived reduction in the cost of services puts the odds of institutional delivery at 2.2. Similarly, Yaya et al. (2018) stated that the perception of the high cost of services puts the odds of noninstitutional delivery at 1.2.

Distance to Health Facility

I found that distance to a health facility was not a significant predictor of health facility delivery, OR = .83 [CI: .4, 1.9]. It was rather an unexpected finding that if the distance to a health facility was not a problem, the odds for nonfacility delivery was 1.2.

Other studies had variable observations and interpretations regarding the distance to health facilities. Olowookere et al. (2017) found that a woman within 10-30 minutes walking distance from the health facility is more likely to have health facility delivery. Kifle et al. (2018) found that a distance of less than 2km was a significant predictor of health facility delivery, with odds of 14.7. But a distance of between 2-5km was not a significant predictor for health facility delivery, with odds of 1.03. According to Adedokun and Uthman (2019), if a woman experienced difficulties getting to a health facility, the odds of not having an institutional delivery was 1.3. It is indicative from this study in Lagos that distance from a nearby facility may not be a challenge, but that as much as 17% of the women were likely to have noninstitutional deliveries because of other reasons.

Quality of ANC

I found that having good quality ANC statistically significantly ($p = .005$) predicts health facility delivery with the odds ratio of 2.2 [CI: 1.3, 3.8]. The finding is consistent with previous studies demonstrating that institutional delivery is associated with the supplied quality of care and the perceived quality of care. Chukwuma et al. (2017) found that if a health facility adhered to the minimum care package, it would positively predict a pregnant women's retention to have an institutional delivery. From the demand side, a client's satisfaction with previously received care from the same health facility significantly predicts the use of a health facility for delivery (Chukwuma et al., 2017; Emelumadu et al., 2014; Nwankwo et al., 2019).

Type of Health Facility for ANC

Out of all the health service factors in the model, I showed that the place where ANC attendance occurred is the strongest predictor for health facility delivery (p = .000). If a woman had ANC at a public facility, the odds of a health facility delivery was 6.4 [CI: 2.3,18]; the odds become 11.7 [CI: 4.1,33] if a woman had ANC at a private facility, and odds increases to 15.3 [CI: 1.6, 146] if ANC was in some other place. All three associations were statistically significant. There are limited studies showing how private facilities are a predictor for pregnant women's delivery. Wong et al. (2018) made a direct opposite inference in a country-wide study, stating that the predominance of private facilities in communities with many poor households limits pregnant women's ability to have institutional delivery. However, my data revealed that while 41% and 45% of the pregnant women had ANC in public and private health facilities, respectively, 27% had deliveries in a public facility compared to 48% who had deliveries in a private facility. Although it may be challenging to trace pregnant women individually, it is indicative that private facilities' predominance for a state like Lagos is not a major hindrance for health facility delivery if a woman was attending ANC.

Study Findings in the Context of the Theoretical Framework

There were two theoretical frameworks used for the study: the focusing on the barriers model and the HBM. The first model applies to the first three RQs. The inquiries include sociodemographic variables and pregnant women's perceptions about their obstetric factors and appropriateness of obstetric health care to meet their needs. The second model is readily applicable to

the second and third questions to elicit the extent to which women with their

obstetric factors perceive any risk associated with pregnancy and how sufficiently

motivated they are to use, as a benefit, skilled obstetric services in health facilities. In this

section, I use the models to discuss the study findings using the three clusters of factors:

sociodemographic factors, obstetric factors, and health service factors.

Sociodemographic Factors

Age. In this study, my data showed that women between 35-39 years have higher

odds, $OR = 1.4$ [CI: 6, 3.5], of delivering in a health facility than the younger age groups.

The odds dropped to 1.2 [CI: .4, 3.2] for women 40 years and older. The finding is

similar to other researchers' findings that much younger women have lower odds of

delivering in a hospital, and the difference is in the cut-off age. Dahiru and Oche (2015)

found that the odds of institutional delivery increase for women aged 25 years and older,

while Egharevba et al. (2017) reported that those between 20-29 years had a higher

tendency to deliver in a health facility than the younger women. The applicable construct

in the focusing on the barriers model is acceptability, which focuses on the perceptions

and expectations of the pregnant women as potential beneficiaries and the attitude and

quality of services provided (Urquhart et al., 2016). From the various studies, other

underlying factors present through age determine young women's perception of the

period from pregnancy to childbirth. The first of such underlying factors would be the

maturity of the women who most times would be carrying their first pregnancy. In

Nigeria, the extended family structure is an enabler that makes it possible for young

pregnant women to be influenced into what is considered socio-culturally acceptable.

Sometimes, this could be home deliveries or by a traditional birth attendant. Other intricate factors associated with younger women include early marriage, lower education, and pregnancy non-readiness. All these can fit into the acceptability construct of the model. Adewuyi et al. (2019) found that 70% of young mothers between 15-24 years had their deliveries at home, which was higher than the 63% national average for all women of reproductive age in Nigeria.

Level of Women's Education. I found that women having secondary and tertiary education statistically significantly increased the choice of a health facility delivery. With a secondary education, I found the odds of health facility delivery to be 3.5 [95% CI: 1.32, 9.10], while those with tertiary education have the odds of 6.0 [95% CI: 1.85, 19.20]. Other researchers similarly found that having a secondary or tertiary education influences women significantly by 2.5 times more to choose to give birth in a health facility (Egharevba et al., 2017; Fawole & Adeoye, 2015; Nwankwo et al., 2019). Based on the focusing on the barrier model, awareness is a relevant and appropriate construct. It refers to being aware of a range of services and why they should be used (Urquhart et al., 2016). It does not imply a full understanding of maternal health services for an educated pregnant woman, including ANC and deliveries. Instead, it is about the capacity to acquire knowledge that is available from various sources. Such knowledge can lead to the ability to make an informed decision about using a health facility for delivery.

Husbands' Education. In this study, my data showed that the odds are slightly higher for a woman to deliver in a health facility if the husband has some education. However, it was not a statistically significant predictor. For a husband with primary

education, the OR = 1.6 [CI: .4, 6.2] for a health facility delivery, if he had a secondary education, the OR = 1.1 [CI: .4, 3.4] for a health facility delivery, and tertiary education, the OR = 1.3 [CI: .4, 4.3] for institutional delivery. The awareness and acceptability constructs of the focusing on the barriers model also apply to a pregnant woman's husband. This is because, in a patriarchal society like Nigeria, it is difficult to underestimate a man's influence on family decisions. However, Lagos State is mostly urban, and this study showed that 53% of the women had a secondary education, and 32% had higher education. Both the urban nature and the women's education level potentially meant that they are passably enlightened and economically empowered to contribute to decision making.

      Place of Residence. I found that residence, whether rural or urban, does not significantly predict where pregnant women would give birth. The OR = .8 [C.I:.3, 2] for health facility delivery if a woman resided in a rural area. This observation is not so different from other researchers who found that living in rural areas is associated with disadvantages such as access to basic amenities (Adedokun & Uthman, 2019). Availability of human resources for health, equipment, and other resources and geographic accessibility are two constructs of the focusing on barriers model that can explain this study's findings. The fact that the urban, rural divide is not a significant predictor for where the women in Lagos gave birth is not implausible because the State is mostly urban (NBS, 2018). From this study, my data showed that 94% of the women reside in urban areas compared to 36% in rural Lagos. Therefore, to a large extent,

availability and geographic accessibility to basic infrastructures such as public and

private health facilities may be sufficient, irrespective of the quality of care.

Obstetric Factors

Parity. In this study, I found that parity above one decreases the odds of health

facility delivery. A parity of four and above has OR = .4 [CI: .0, 2.8], while a parity of

two to three has OR = .7 [.15, 3.7]. The finding presents a mixed picture of previous

studies regarding the relationship between parity and institutional deliveries. The parity

of five or more decreases the likelihood of a health facility compared with women who

have had 1-2 live births (Alfred et al., 2017; Ononokpono & Odimegwu, 2014). Based

on the focusing on the barriers model, the acceptability of the services and the service

providers based on previous experiences can influence women's decision to use health

facilities another time for delivery. For the HBM, all the constructs of perceived

susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action,

and self-efficacy are applicable. These constructs come into play during a woman's

delivery experience, whether she delivered at home or in a health facility and may

include any physical discomfort or harm and the pregnancy outcome. Idris et al. (2013)

showed that one reason for not using health facilities for subsequent deliveries was the

absence of past delivery complications.

Number of Children. In this study, my data showed that as the number of

children increases beyond one, the odds of health facility delivery increases. For a

woman with two or three children, OR = 1.1 [CI: .2, 5.5] and if a woman had four or

more children, the OR = 1.3 [CI: .2, 9.3]. In other studies, the researchers found that as

the number of children increases, the likelihood of a health facility delivery decreases.

(Alfred et al., 2017; Egharevba et al., 2017; Ononokpono & Odimegwu, 2014). But

Okafor et al. (2014), who gave attention to urban residents in a Lagos study, found that as

the number of children increased, the likelihood of health facility delivery increased. For

my research, the availability construct of the focusing on the barrier model that describes

the integration of maternal and child health services may explain the likelihood of

institutional delivery as the number of children increases. It is such that going to a health

facility for a maternal health service enables access to child health services and vice

versa. Also, the constructs of the HBM are likely to be reinforced when women take their

children to health centers.

Use of ANC. I found that when a pregnant woman attended ANC, the odds of

health facility delivery was 9.0 [CI: 3.7, 22.2] compared to another woman who did not

have ANC. This observation is a consistent finding from other research regarding the

association of ANC utilization and institutional delivery. ANC seats well with the

accommodation construct of the focusing on barriers model, which describes a continuum

of care, in this case from prenatal care to delivery services. In the ANC process, health

education, promotion, and counseling services are part of the design to improve the

women's cues to action and self-efficacy based on the HBM. My results showed that

while 96% of the pregnant women in Lagos had ANC, 81% had health facility delivery.

The implication is that even though ANC attendance is a statistically significant ($p =$

.000) predictor for health facility delivery, 9.0 [CI: 3.7, 22.2], it cannot alone explain the

15% who had ANC but did not deliver in a health facility.

Number of ANC Visits. With the observation that ANC alone cannot explain the use of health facilities for childbirth, my findings showed that ANC's association with health facility delivery is mediated most likely through the number of ANC visits. If a woman had ANC visits between one to three times, the likelihood of a health facility delivery was 1.3 [CI: .3, 5.2]. This was not statistically significant ($p = .692$). However, if a woman made four or more ANC visits during her pregnancy, the likelihood of health facility delivery was 9.0 [CI: 3.7, 22.2], which was statistically significant ($p = .000$). The cues to action and the self-efficacy constructs of the HBM would strengthen the observation that the repeated exposure to ANC would increase the chances of health facility delivery. Therefore, it justifies the recommendation of a minimum of four ANC visits by the WHO to allow for focused ANC (Dahiru & Oche, 2015; WHO, 2013). From my study, using absolute numbers, of the 483 women who had health facility deliveries, 475 (98%) of them had four or more ANC visits.

Health Service Factors

Cost of Services. In this study, I found that for women who did not consider the cost of services as a challenge to accessing care, the odds of delivering at a health facility was 1.8 [CI: 1, 3.3] but was not statistically significant. For women with health insurance, the odds for health facility delivery was 1.4 [CI: .4, 5.7]. This is consistent with other studies. Based on the focusing on barriers model, the cost of services will fall under accessibility and acceptability constructs. Accessibility, in this case, is not physical but financial and will depend on the capacity to pay for obstetric care. Acceptability is linked to accessibility and relates to what the woman or her family considers reasonable

to pay for obstetric services from their disposable income. Overlaying with perceived

susceptibility, perceived severity, perceived barriers, and perceived benefits of the HBM

introduces the willingness to pay concept. While perceived high cost is a known deterrent

for the utilization of health services, my findings showed that willingness to pay for

maternal services was high in Lagos. Despite only 5% of the women having health

insurance, 74% said that the money required for health care was affordable to them.

Distance to Health Facility. I found that the likelihood of a nonfacility delivery

because of its distance from homes was 1.2. Similar to the cost of services, distance to

health a facility can be explained by the constructs of availability and accessibility of the

focusing on the barriers model. The fact that Lagos State is mostly urban and densely

populated can explain why distance to a health facility, irrespective of type, is not of any

consequence for 88% of the women.

Quality of ANC. Furthermore, I found that having good quality ANC statistically

significantly ($p = .005$) increases health facility delivery likelihood by 2.2 [CI: 1.3, 3.8].

The finding is consistent with previous researchers who demonstrated that institutional

delivery is associated with the supplied quality of care and the perceived quality of care.

Using the focusing on barriers model, the quality of ANC begins with the awareness

construct that delineates the complete package of services during ANC and delivery and

the justification for its use. Next is the uninterrupted availability of the right skills,

providing the minimum care package through the continuum of care. Also, the

acceptability construct requires that quality is socially and culturally acceptable.

Additionally, the perceived benefit of the HBM can provide how far women are willing

to go to ensure they get nothing less than the desired quality of care. In most cases, as with my study, the quality of ANC is assumed to be optimal when trained health workers are the service providers.

Type of Health Facility for ANC. My findings showed that the type of facility where a woman had ANC attendance was the strongest health service predictor for health facility delivery ($p = .000$). If a woman had ANC at a public facility, the odds of a health facility delivery was 6.4 [CI: 2.3,18], the odds become 11.7 [CI: 4.1,33] if a woman had ANC at a private facility, and odds increases to 15.3 [CI: 1.6, 146] if ANC was in some other place. There are limited studies showing how private facilities predict pregnant women's delivery, which was one reason I carried out this study. The decision to use a particular type of health facility for ANC depends on the full constructs of the focus on barriers model, awareness of services provided, the availability of all the mix of desired care, geographic and financial accessibility, socially and culturally acceptable, and the linkage from ANC to delivery. Unlike the study by Wong et al. (2018), which was country-wide in terms of geography, that concluded that where there are large clusters of private health facilities, there is a likelihood that many women will not have deliveries in health facilities because of the cost of delivery. This, he concluded, especially so if women did not have prior savings for childbirth. While this study is unable to disprove Wong et al. (2018) altogether, it has generated additional evidence that attending ANC in a private health facility does not necessarily limit the use of health facilities for delivery. Apart from having ANC at home and not having ANC, having ANC in private or public health facilities positively predicts health facility delivery. This study showed that the

likelihood of health facility delivery is more with ANC utilization in a private facility compared to having ANC in a public facility, 12 times compared to 6 times, respectively. In absolute numbers, while 270 (45%) women attended ANC in a private health facility, 285 (48%) were delivered in a private facility. On the other hand, of the 245 (41%) women in Lagos State who had ANC in a public health facility, 160 (27%) had their delivery in a public facility.

Strengths of the Study

Based on my literature search, my study is the first in Lagos State, Nigeria, to investigate how the predominance of private health facilities interacts with sociodemographic, obstetric, and health service factors to influence the place of childbirth. The sample size was 598 based on the available secondary data set against the calculated minimum sample size of 378, which provided sufficient power. The demographic health survey has a standardized, globally accepted methodology for selecting households and respondents and is only adapted for each country, and so can be said to have construct validity (Bostoen et al., 2007). Related to this is that the definitions are standardized for the variables, which assures content and construct validity.

Limitations of the Study

Firstly, because a secondary data set was used for the study, the inherent weaknesses apply, such as the inability to account for missing or incomplete data and categorical entries rather than continuous. Secondly, human behavior is complicated. Using secondary and quantitative data would not explain any observed association between the independent factors and the outcome of interest, being the place of delivery.

Thirdly, in calculating the score for quality of care provided, variables where the response was missing or "don't know" received a score of 0, which implied that the woman did not receive that service. Fourthly, I had intended to determine the quality of ANC from the supply and demand side, but no variables existed in the data set to assess quality from the beneficiaries' perspective. A fifth limitation is that because the survey was based on self-reporting, there may be recall bias or an intentional bias to provide responses perceived to be socially acceptable. A sixth limitation is that it was not practicable to rank private and public health facilities according to the levels of care, from a primary, secondary, and tertiary level of care. The level of care has implications on cost and quality of care as examples. Lastly, the components of sociodemographic, obstetric, and health service factors that exclude social norms and cultural practices may not wholly explain the complex behavior of choice of place of childbirth.

Recommendations

This study has contributed to the body of knowledge regarding the factors that influence pregnant women's choice of the place to give birth in Lagos, Nigeria. The evidence provided from this study was demonstrated by the association of some sociodemographic factors, obstetric factors, and health service factors with the place of choice for childbirth. However, it did not provide evidence to determine the reasons for the gap between ANC attendance and those who had institutional delivery. While this study found it is not just ANC attendance but four or more ANC visits that strongly predict health facility delivery, it could not also explain factors that contribute to less than four ANC visits by pregnant women. Further research is needed to determine the factors

that influence making four or more ANC visits, as it may unlock the potential for increasing health facility deliveries. While this study is quantitative, using secondary data, there will be a need to add a qualitative component in future research to understand why women have their deliveries outside a health facility, including the possible incentives.

The finding of this study has shown that utilization of private health facilities is not a limitation for institutional delivery. More people used private facilities for ANC, and even more had deliveries in a private facility compared to public health facilities. However, more research is needed to study the spectrum of non-health facility deliveries (including home, traditional birth attendants, and others) to understand the complement of the services provided for ANC and natal care. Also, there is a need to understand the motivations and incentives for the women who do not utilize health facilities, using qualitative methods. Such evidence will guide the type of interventions that will be tailor-made for the different service providers who are outside of the health facilities. Such motivations from the demand side may be deeply rooted in certain social norms and cultural practices, requiring further research to uncover health services' acceptability from a cultural perspective.

Implications

Because the issue of utilization of health facilities for deliveries by pregnant women is influenced by the intricate relationships between sociodemographic, obstetric, and health service factors, applying the evidence from this study has implications for social change across all levels, from policy to the individual. Regarding policy, there will

be a need to develop policies that will be more inclusive of private health facilities' role

in providing ANC and delivery services. A previous researcher had inferred that the

predominance of private health facilities in a location reduces the odds of using health

facilities for pregnant women's delivery (Wong et al., 2018). However, this study's

findings have shown that ANC attendance in a private health facility is a strong predictor

for health facility delivery. More women had their deliveries in private health facilities

than public ones, including some who had ANC in public facilities but had their

deliveries in privately owned health facilities. Such policy changes can cover the broad

inclusion of private health facilities within the primary health care framework and ensure

an optimal enabling environment that can make them thrive and compete favorably. An

example is developing a compulsory health insurance policy, currently grossly

inadequate, and ensuring that it covers ANC and deliveries in public and private health

facilities.

At the organizational level, there is a potential for improving health workers'

capacity in public and private facilities to deliver the minimum package of ANC and

delivery services. Whether health providers are operating informally or formally, the

paradigm will be their inclusion in a mapping process that will facilitate capacity

building, mentoring, and supervision. Based on the focusing on barriers model, the

availability, accessibility, affordability of health care services, and acceptability of type

of maternal health services and health care providers, as perceived by pregnant women

and their community, will increase the utilization of both ANC and delivery services

(Derose et al., 2011). This study results have shown that this is irrespective of whether it

is a public or a private health facility. According to the focusing on the barriers model, the link between the service providers in whatever type of facility and the uptake of obstetric services is the sustained provider and beneficiary awareness of available services for ANC and natal care with evidence justifying the necessity for utilization (Derose et al., 2011).

With increased awareness of the necessity to use available services, the relevance of the HBM, the second theoretical framework that I adopted for this study, is reinforced. This is because increased awareness of potential beneficiaries and their social networks can lead to a higher perception of vulnerability to pregnancy risks and the perceived benefit of ANC and delivery services as interventions to mitigate complications and improve health outcomes.

In describing recommendations for practice, focusing on the barriers model constructs will be used as the intervention framework. The government needs an updated mapping of public and private health facilities with basic obstetric care, emergency obstetric and newborn care, and comprehensive emergency obstetric care as a prerequisite for both availability and accessibility. This will include the cadre of health workers and the type of infrastructure that is available. The accommodation construct of the focusing on the barriers model is the most important based on this study's findings. While it is concerned about the continuum of care and the referral linkages (Urquhart et al., 2016), it can expand to include the non-formal health providers and traditional birthing homes that tend to be missed or undocumented. The necessity for this is because the findings from this study have shown that the place of ANC attendance (home, public

facility, private facility, and others) strongly predicts the place of childbirth. Therefore, the government would need to engage with all potential obstetric care providers and key community leaders (including women leaders) and devise incentives such as recognition and training to regulate and standardize the practice. This would include a shared understanding of each cadre of health provider boundaries depending on the skills and available infrastructure. The rationale for this is the acceptability construct of focusing on the barrier model, which describes perceptions, expectations of potential beneficiaries, and the providers' attitude and perceived quality of service. This recommendation applies to the 8% and 2% of women showed by my data who utilized ANC at home and other places. It also applies to the 19% and 6% who gave birth at home and other places.

Whereas this study had narrowed institution deliveries to private health facilities (individually owned and for-profit) and public health facilities (government-owned health centers), the social change implications extend to the broader public health discipline. Using the essential public health services of the Centers for Disease Control and Prevention (CDC, 2021) as a framework, this study identified women of the reproductive age group subpopulation as the entry point to interrogate the weak health system that is responsible for the high maternal mortality. Without attempting to exhaust all the essential public health services, I will highlight some relevant services to this study.

Regarding the assessment and monitoring function of public health over the sub-population (CDC, 2021), through this study, I have identified some factors influencing the health of the subpopulation and found that the current health provision is not adequately meeting their needs. Hence the nonutilization of the formal health centers for

childbirth. As part of this function, there are standard indicators for monitoring whether a woman progresses in the continuum of care, such as first ANC visit, fourth ANC visit, or more and delivery by SBA. With the process monitoring, there is a need for further community diagnosis, another public health function (CDC, 2021), to understand facilitators and barriers to utilizing ANC and institutional delivery services, especially in qualitative terms. This leads to two other essential public health functions: effective communication and community mobilization (CDC, 2021). There is a need to communicate the community diagnoses results, which becomes a tool to mobilize all community stakeholders, formal and informal, to improve four or more ANC visits which is the most important predictor for health facility delivery. While these systemic or transitional changes will contribute to building a stronger public health system, I suggest a transformational change for a more enduring impact.

Wheeler et al. (2016) describe a transformational change as a fundamental and definitive change that affects priorities, strategies, and the entire culture of an organization, which in this context is the public health system. The outlook of the current public health system in Lagos and nationwide is heavily structured, rigid, and overly focused on government owned health centers. Meanwhile, as shown from this study, other private and informal providers offer maternal services that, in most cases, are untracked and not guided by the public health system. A transformational change is essential to drive the desired social change. Wheeler et al. (2016) proposed three value disciplines adapted from the cooperate organizations to transform public health systems to make them more efficient and competitive. These disciplines are product leadership,

operational excellence, and customer intimacy, and there are applicable to the obstetric and health service factors within the public domain.

For product leadership, it is about developing new approaches and avenues to get the services across to consumers, and the strategy involves the elimination or reduction of the boundaries, in this context between the formal and informal, government and nongovernment facilities (Wheeler et al., 2016). The implication is that the Lagos State public health system needs to have a broader perspective beyond the formal centers, be innovative enough to engage the private and informal providers, and provide the right incentives for them to offer the standard package of obstetric services. For operational excellence discipline, reliability, competitiveness, convenience, integration, and compliance to norms are the objectives (Wheeler et al., 2016). The suggestion for social change is to meet the women where they reside with integrated outreaches, including packages of ANC to facilitate that pregnant women get four or more ANCs that will provide the opportunity to plan childbirth. For customer intimacy discipline, the focus is on offering a total solution and involves product leadership and operational excellence. It also requires the use of providers closest to the client. An example of its application is working with community health volunteers to track pregnant women who missed their ANC appointments.

To summarize the implication of this study for social change, the public health system in Lagos State should not wait for pregnant women to come over to it but should be proactive and adopt a transformational change and market approach. The public health system can be innovative and adaptive (CDC, 2021) so that it can reach out to meet with

pregnant women in all the places they reside with a standard and acceptable service that they can access.

Conclusion

For this study, I explored whether a cluster of sociodemographic, obstetric, and health service factors influenced the use or nonuse of health facilities by pregnant women in Lagos, Nigeria. The results provided answers to the hypotheses that there was an association between sociodemographic factors, obstetric factors, and health service factors, and the place of delivery used by pregnant women in Lagos State, Nigeria.

For the sociodemographic factors, a woman's educational level and the wealth index were the most important predictors for health facility delivery before and after adjusting for whether she attended ANC. Of the obstetric factors modeled, ANC attendance and the number of ANC visits were the significant predictors of institutional delivery. But with a critical review of the model before and with the inclusion of ANC attendance, and with the plausible explanation, I found that ANC attendance is mediated through the number of ANC visits to predict health facility delivery. The third hypothesis involving a cluster of health service factors showed that the quality of ANC services and the place where women received ANC were the significant predictors for health facility delivery, before and after adjusting for ANC attendance.

For a full model with all the independent variables, having four or more ANC visits (an obstetric factor) and the place where women received ANC (a health service factor) were the two important predictors for a pregnant woman to deliver in a health facility. When viewed from a typical scenario, this observation explains that when there

is optimal disposal income (wealth index). And a woman is educated to the extent of self-efficacy. Also, that quality of care is assumed to be adequate, then, where women attend ANC, and the number of ANC visits predicts health facility delivery. This institutional delivery will assure that a pregnant woman will have access to SBAs and expectedly reduce the unexpected complications in the perinatal period, which will, in turn, reduce maternal mortality.

In conclusion, interventions should be within a policy framework that assures a continuum of care across the levels of care and across public, private, and informal providers to ensure standardized care packages for each service provider category. Specifically, this study has shown that private health facilities' predominance is not a barrier to institutional delivery. Finally, with the minimum package of care in place from the supply side, awareness needs to be sustained to promote four or more ANC visits in every location possible, which is the most important predictor for health facility delivery.

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