TITLE:

ANALYSIS ON THE DETERMINANTS AND RESPONSES TO THE PROBLEM OF VESICOVAGINAL FISTULA IN NIGERIA.

A THESIS SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE DEGREE

OF

MASTER OF INTERNATIONAL HEALTH.

BY

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DECLARATION

Where another peoples' work has been used (either from a printed source, internet or any other source) this has been carefully acknowledged and referenced in accordance with the Departmental requirements.
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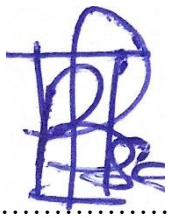
Signature: 

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LIST OF ACRONYMS/ABBREVIATIONS

Bmoc - Basic Medical Obstetric Care

CIA – Central Intelligence Agency

DHS – Department of Health Services.

EmOC – Emergency Medical Obstetric Care

FGM - Female Genital Mutilation.

FIGO – Federation of International Gynecologists and Obstetricians

GDP - Gross Domestic Product

HCS – Health Care Services.

HCW – Health Care Worker.

HDI – Human Development Index

HF – Health Facility.

HIC - High Income Countries.

LGA – Local Government Area

LMIC – Lower Income Countries.

MCHS – Maternal and Child Health Services.

MHCS – Maternal Health Care Services

MOH - Ministry of Health

MWH – Maternity Waiting Homes.

NDHS – National Demographic Health Survey.

PTSD – Post Traumatic Stress Disorder

SBA – Skilled Birth Attendants

SDG – Sustainable Development Goals.

SES - Socioeconomic status

SSA – Sub-Saharan Africa.

TBA - Traditional Birth Attendants

UNFPA – United Nations Population Fund.

UNICEF - United Nations Children Emergency Fund.

VVF – Vesicovaginal Fistula

WHO-CSDH – World Health Organization-Commission for Social Determinants of Health

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ABSTRACT

Background

Vesicovaginal fistula is an age-long, preventable calamity in many lower-income-countries including Nigeria.

Objective

The objective of this thesis to analyze the Determinants of vesicovaginal fistula in Nigeria and also interventions with the potential to reverse the trend of the problem in Nigeria. The study offers recommendations to the Government and all stakeholders in the provision of policies and guidelines in prevention and are of women with VVF.

Methods

A literature review of articles was conducted of peer-reviewed articles, grey literatures using Google, Google scholar, Pubmed as search engines, Nigerian Demographic and Health survey and official sources of Nigerian statistics. Data was analyzed using the Rainbow model of Dahlgren and Whitehead for the Determinants of Health.

Results

Vesicovaginal fistula is a huge public health problem in Nigeria with a incidence rate of 2.11 per 1,000 deliveries and prevalence of 3.2 per 1,000 deliveries. Obstructed labor is the major cause of vesicovaginal fistula in Nigeria accounting for more 70%-90% of cases in Nigeria. Other causes include accidents during pelvic surgeries (iatrogenic), infiltration by advanced malignancies like cervical cancer, uterine rupture and gishiri cut. Consequences include physical, social, psychological and economical. The determinants of Vesicovaginal fistula are interlinked. Young age at marriage and childbearing, low literacy and awareness, low socio-economic status and access to Emergency Obstetric care services and gender inequality are the main drivers of the problem in Nigeria. Interventions including strict laws and enforcement against child marriage, improved access to Emergency Obstetric care, promotion of girl-child education and women empowerment have shown to have the potential of reversing the current trend.

Conclusion

Analysis of the association of VVF with the determinants at the different levels in the society. Low socioeconomic status, poverty, low literacy and access to Emergency care the drivers that constitute an interlink that makes it difficult to prevent and eliminate the problem in the country. There is need for the Government and all stakeholders to come together and bring forth measures to prevent and eliminate the problem in the country.

Keywords: Vesicovaginal Fistula, Magnitude, Consequences, Determinants of Health, Intervention, Sub-Saharan Africa, Nigeria.

CHAPTER 1

BACKGROUND INFORMATION OF NIGERIA

1.1 Introduction

My name is Bashir Hamzat Isa. I am a Nigerian working as a Medical Doctor working with a state-owned hospital, located in the north western region in Nigeria. I graduated from medical school in 2013 and worked as an intern and later as a general practitioner in a hospital dealing with women with fistula, a fistula center for a year before joining another hospital, all in Sokoto state.

During my time at the fistula center, I have encountered several women with Vesicovaginal fistula (VVF), with different forms and level of severity. This triggered my inquisitiveness in wanting to know all that entails about the problem of VVF in Sokoto state and Nigeria at all. I realized that despite the Nigerian government's and several stakeholders' efforts to reduce and prevent the disease, it continues to prevail and surge at an alarming rate and with the frail nature of Nigeria's health system, the picture is not a pleasant one to predict.

VVF is one of worst childbirth complication that can befall on any woman. Hence, they need to quickly prevent and arrest this problem. However, to properly address the problem, there is need to properly understand and analyze what truly the problem is, what are the determinants and promote or threaten its prevalence as well as interventions with the potential to reverse the trend.

As the most populous nation in Sub-Saharan Africa and the country with the highest number if VVF cases, I find it interesting and necessary to study and analyze what the magnitude, consequences and determinants of VVF are in Nigeria and hopefully come with evidence-based recommendations to the Nigerian government through the Federal Ministry of Health to tackle the burden of VVF in Nigeria.

1.2 Country Profile on Nigeria

1.2.1 Geography

Nigeria, officially called Federal Republic of Nigeria is a country located in the Western, Sub-Saharan part of the African Continent. It shares border with Republic of Benin on the West, Republic of Cameroon on the East and the Republics of Chad and Niger on the Northern border(1). It has a total land mass of about 910,770 km^2 and a population density of 226/km^2. The movement of airmass from the South to the North of the inter-tropical convergence zone of the equator gives Nigeria its 2 seasons of wet and dry seasons, typically seen in a tropical climate(2).

The country is divided into 36 states and a Federal Capital Territory, with 774 Local government areas and 9,572 political wards(3).

Figure 1 showing the map of Nigeria

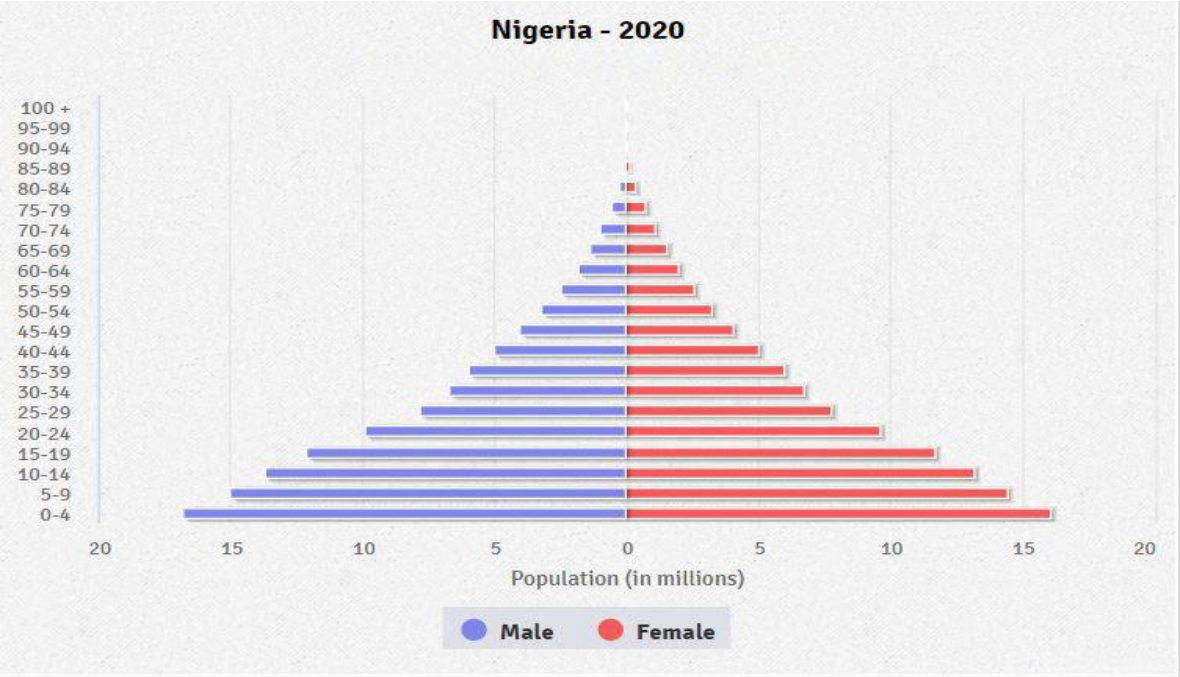
Source: www.mapsofworld.com

1.2.2 Demography

As at early 2020, Nigeria's population was 205,912,789 and the UN estimated Nigeria's mid-year population to be around 206,139,589, which is equivalent to 2.64% of the total world population(4)(5). This makes the country the most populous country on the African continent as well the 7th most populated country in the world. With the current high annual population growth of 2.58%, it is estimated that the population will reach 264 million by the year 2030 and 300 million in the year 2036(4). People within the age range of 0-14 years constitute the highest percentage of the age profile with 42%, then followed by 15-24 years with 20.27%, 25-54 years with 30.6%, 55-64 years 4.13% and 65 years having the least with 3.3%(6). The current median age is 18.4 years and the number of male and females is almost the same (1.04 male: 1 female). Though the females tend to outnumber the males after the age of 65

years(4). The figure below shows the population pyramid of Nigeria showing the age and sex distribution.

Figure 2: Showing Population Pyramid of Nigeria, 2020 with age and sex distribution



Source: www.worldometers.info/world-population/nigeria-population/

Nigeria is a country with diverse cultural background owing to its multiple ethnic groups. The Hausa-Fulani, which are 2 different groups but merged into one as result of inter-tribal marriages, constitute the largest ethnic group in the country and mainly occupies the Northern states of the country (up to about two-third of it). They are the most politically-active group since the country's independence in 1960. Other major ethic groups are the Igbo in the South-Eastern Nigeria and the Yoruba mostly in the South-Western states of the country(4). Annual increase in urbanization is 4.23% and 52% of the total population are urban dwellers(6).

1.2.3 Religion

There are two (2) main religions in Nigeria are Islam and Christianity. Nigeria has the highest population of Muslim followers in SSA and is the predominant religion in the country with about 53.5% of the total population being Muslims(7). They are mostly in the North (Hausa-Fulani) as well as has some followers in the Yoruba or South-Western states. Though, some Yoruba people also practice Christianity and traditional religion. In the Igbo lands in the

South-East, it is predominantly Christianity and constitute about 45.9%, while other religions make up the remaining 0.6% (7)(8).

1.2.4 Socio-economic status

Nigeria is a Lower-middle-income country but has the largest economy in Africa. According 2019 official data from the World Bank, the country's Gross Domestic Product (GDP) is worth 410 US dollars per capita, which is also equivalent to 0.34% of the global economy(9). Prior to the discovery of oil in the 1950s, agriculture was the main source of foreign exchange. As at 2016, agriculture contribute about 36.5% of labor workforce and 21% GDP to the economy. However, almost 90% of Nigeria's farmers are practicing subsistence farming making more than 70% of Nigerians farmers to thrive below the poverty level of 1.09 US Dollar per day(10). Total youth unemployment rate is 13.8%(6). As of 2019, national poverty rate is 40.1% and Gini index/coefficient 35.1 with northern states in Nigeria been the worst hit(11)(12).

Developmental challenges like lack of financial management systems, reduce dependency on oil and lack of economic diversification has continue to negatively affect the nation's economy. As of 2018, Nigeria's Human Development Index (HDI) is 0.534, making it to occupy the 158th position out of the 189 countries(13).

1.2.5 Education

Education is jointly given by the three tiers of government in the country, namely- local, states and the federal governments. Though the formulation of educational policies, quality control and tertiary education is chiefly the responsibility of the Federal Government through the Federal Ministry of education(14). Language of instruction at all levels from the fourth grade is English. The organizational structure is divided into three levels; the basic education level which is 9 years, then post-basic/secondary schools which is 3 years and tertiary level, which depending on program is 4-6 years(14). Despite basic education being officially compulsory and free in Nigeria since the year 1999(15), more than 10 million of the country's total population of children aged 5-14 years are without education or are out of school. The picture is even worse for girls in the Northern states of the country where more 50% of their population do not go to school(16).

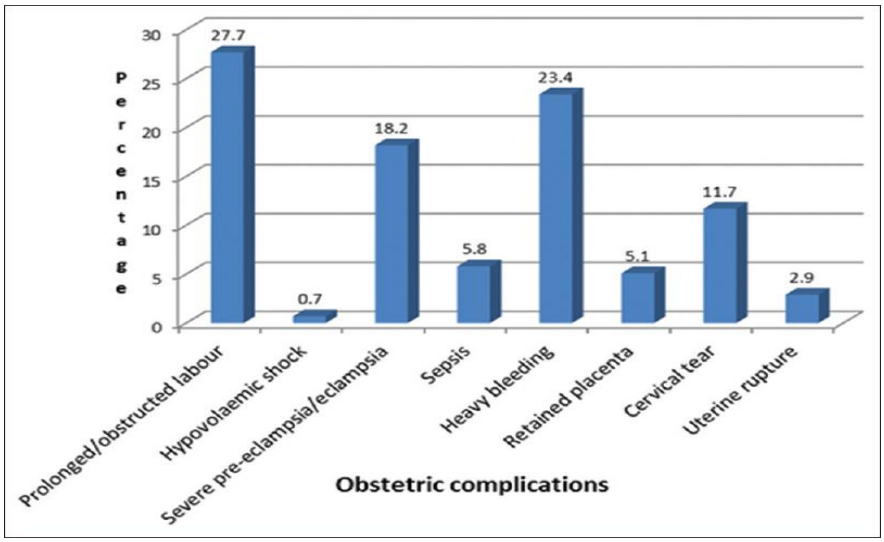
As of 2019, 62% of Nigeria's total population is literate with the figure higher in males than in females- 71.3% and 52.7% respectively. Total school life expectancy, which is progression from primary to tertiary schools is 9 years, males with 9 years and females having 8 years(6).

1.2.6 Health Indicators

Life expectancy from birth has improved from 55 and 56 years in 2016 to 58.6 and 62.3 years in 2020 for males and females respectively. Total life expectancy is 60.4 years(6)(17). Nigeria has one of the highest birth rate in the world with 39 births per 1,000 population with discrepancies across states and regions in the country(2). Total fertility rate in those aged between 15-49 years is very high and is 5.5 birth per 1,000 population, with rural population (6.2 per 1,000 population) having higher rates than urban counterpart (4.7 per 1,000 population)(2).

Despite having high fertility and birth rates, maternal health indices are abysmal in the country. Maternal mortality rate (MR) is 1.05 per 1,000 women-years of exposure and is equivalent to 32% of global maternal deaths in those aged between 15-49 years. Maternal Mortality ratio (MMR) is 576-917 deaths per 100,000 live births. This translates to 1 in every 30 women stands the risk of dying as a result of pregnancy or childbirth(1)(2)(6). The figure below shows major obstetric complications in Nigeria.

Figure 3 Showing major obstetric complications in Nigeria



Source: www.njcponlinne.com

1.2.7 Health Systems

Provision of Health care services in Nigeria is via primary, secondary and tertiary levels by the local, state and federal Governments respectively, and involves also both the public and private sectors(18). The health systems are decentralized in a way that, the federal government is responsible for tertiary/referral centers, the secondary health institutions are overseen by the state governments, while the local governments are responsible for the primary health centers(19)(20). Nearly all states in the country have declared free access to maternal and newborn health services (MCHS) to lessen financial barrier and improve access, services rendered and coverage differ, and oftentimes the declaration of free MCH services are not in tune with the resources provided for ensure proper implementation(1). Health financing is through multiple sources viz; government budgeting through revenue generating from tax, out-of-pocket payments, National health insurance scheme and donor funding(21). Out-of-pocket payment constitute more than 90% of health financing in Nigeria as less than 10% of the entire population is enrolled in the national health insurance scheme(21). Expenditure on health from all the three tiers of government in Nigeria is less than 6% and constitute less than 25% of the country's health spending, while the private sector make up the remaining 75% of the country's heath spending(22).

Generally speaking, the Nigerian Health system is weak and this cut across all the health system building blocks. The biggest challenges are poor referral system, geographical inaccessibility of these facilities especially to those in the rural areas, as well as unaffordability due to low socioeconomic status The frequent strike actions by health workers in the public health institutions, are the major blockades that cause disruption of healthcare services in the country(1)(23).

On the positive side, Nigeria has achieved some encouraging milestones like halting the spread of Wild Polio Virus, control of Ebola Virus disease outbreak and eradication of guinea worm(23). Nigeria's total expenditure on health per capita is 217 USD and total expenditure of health as percentage of GDP is 3.7%. The ratio of Doctor or Physician per 1,000 population is 0.38(17).

1.2.8 Instability/Insecurity

Nigeria as a multi-ethnic country has been dealing with numerous ethno-religious and tribal instabilities from independence till date. The Northern geopolitical zone of the country is the region that has been affected the worse. In 2009, the Islamic terrorist group known as Boko Haram (BH) with Headquarters in the North-Eastern state of Borno, came into existence with the sole purpose of launching an Islamic caliphate in the region and replacing the Nigerian government by adopting the Islamic Shari 'a law(6)(24). In 2018, another Islamic group by the alias Islamic State of Iraq and Ash-sham- West Africa (ISWAP) also started their campaign that it similar to that of BH. They are also located in the northern parts of Nigeria sharing border with Niger republic in addition to the north-east and lake Chad regions(6).

From 2009 till date, thousands of both military and civilian lives were lost, farming and trading were disrupted, millions of citizens were displaced, attending formal schools for education, especially for the girl child was criminalized and made punishable by them. This also affected the utilization of health care services as well contributes to the high rates of maternal deaths in the country(6).

CHAPTER 2

PROBLEM STATEMENT, JUSTIFICATION, STUDY OBJECTIVES, AND METHODOLOGY

2.0 Background

Vesicovaginal Fistula (VVF) is an age-long, avoidable and preventable tragedy affecting women. It is one of the spectra of medical conditions known as obstetric fistulas or fistulae. These are a group of medical or gynecological complications that arises in most cases as a result of prolonged and obstructed labor, without timely and adequate medical intervention by qualified personnel. This leads to creation of an abnormal connection between the vagina and the urinary bladder (vesicovaginal), rectum(rectovaginal) or the ureters (Uterovaginal) (25). For the purpose of this work, we will limit our focus only on vesicovaginal fistula.

Historically, it is an ancient problem believed to have been in existence since 2050 BC as seen in some Egyptian mummies(26)(27). VVF due to obstructed labor occurs as result of cutting-off of blood supply of the entrapped tissues between the skull of the baby and the small maternal pelvis. This leads to sloughing, thereby creating an abnormal connection between the bladder and the vagina(28). Sequel to this, the patients or survivors of VVF may not only present with physical problems, but some may have psychological problems as well

There are disparities in the incidences of the problem worldwide. Exact estimates of incidences and prevalence are considered to be underreported as they rely on self-reporting, studies from advocacy groups and hospital records. However, the World Health Organization (WHO) in 2014, put the global estimate at 50,000-100,000 new cases each year. This data is of course scanty and needs updating(29). VVF due to prolonged obstructed is presently uncommon in high income countries (HICs) due to provision of adequate and appropriate obstetric services including timely interventions like caesarian sections (25)(30) and has an incidence rate between 0.3% and 0.2%(31). About 83.2% of cases of VVF in HICs are mainly through accidents during pelvic surgical procedures, malignancies or cancers like cervical and vaginal cancers or during radiotherapy in cancer treatment. The remaining less than 20% is due to vaginal instrumentation or external trauma like in rape (30). On the contrary, VVF persists in almost all low- and middle-income countries (LMICs) especially in Sub Saharan Africa (SSA) and South Asia. In about 95% of instances, it is mainly due to obstructed labor(31)..In the remaining 5% or less in LMICs, VVF is due to accidents during surgical interventions (27)(29)(32) . The incidence in Western parts of Africa is estimated to be 3-4 per 1000 deliveries.

Precise data on the number of VVF cases in Nigeria is scanty and there seem to be dissimilarity in the number of VVF cases across all the 6 geopolitical zones of the country. However, a report by United Nations Children Emergency Fund(UNICEF) shows that, the Northern geopolitical zone has the highest proportion of VVF cases in the country, as compared to other geopolitical in the country (33).

2.1 Problem Statement.

In Nigeria, VVF is a nationwide problem and of great public health concern. Recent data from the National Demographic Health Survey (NDHS) put the incidence rate at 2.11 per 1000 deliveries with 12,000 new cases every year(3). Nigeria alone is said to account for more than half of all VVF cases worldwide(34). The prevalence rate in women aged 15-49 years in Nigeria is 3.2 per 1,000 deliveries (1) with about 150,000 backlog cases in Nigeria (3) . There are variations in terms of prevalence of VVF across different states in geopolitical zones of the country, and thus the prevalence of VVF in the country may be higher as majority of patients are remotely situated and/or are not registered in any health center(35). The prevalence of VVF is lower in Southern parts of Nigeria with 0.2% than in the Northern parts of the country, with a prevalence rate of 0.3% (3). The exact and reliable estimate of the incidence of VVF in the country is difficult to define, as it is known that there is low utilization of hospital services for deliveries and as high as 62% of pregnant women aged between 25-34 years do not deliver their babies in a hospital and/or are not registered at a health facility(2)(36).

The most common cause, in more than 70%-90% of VVF cases in Nigeria is prolonged obstructed labor(27)(35)(37). Other known causes for the development of VVF include; advanced gynecological cancers like cervical cancers, rupture of the uterus, accidents during pelvic surgeries (iatrogenic) and harmful traditional practices like female genital mutilation (FGM) or 'gishiri' cutting(27). Risk factors for VVF are low socioeconomic background, low educational status, rural dwellers who have little or no access to adequate, accessible and affordable basic health care facilities and services (28)(38)(39). A hospital study carried out shows there is also an increasing trend in the number of cases of iatrogenic fistula which constitute about 23% of fistula cases in one of the studies done in Sokoto and 16% in Katsina state(33).

Consequences of VVF are not just limited to the individual. It affects the household/family and the community as well. At individual level, it causes physical trauma like pain, urinary incontinence, foot drop, vulva excoriation, recurrent infections and infertility. VVF also causes a lot of psychological trauma on its survivors or patients such as feeling of sadness, especially because in majority of the pregnancies leading to the development of VVF, the baby is a still-born or die few days after birth. Other psychological issues are depression, deliberate self-harm, suicidal ideation and sometimes suicide. The psychological disturbance is also due to marital disruption, rejection or neglect by their spouses and some of their family members, stigma and discrimination they face in the community, thereby making them to feel "empty" or to be seen as lesser human beings (40)(41). Hence, it exerts a negative impact on the general household and the community at large.

Acknowledging the problem of VVF in the country, in the year 2002, the Nigerian Government in collaboration with other developmental organizations like the UNFPA and Fistula care, agreed that the approach to tackle VVF in the country should be an integrated exercise, with the aim to

improve the overall sexual and reproductive health status of the whole country and should not just be limited to medical and surgical care, but must include prevention measures and rehabilitative care services (3).

The following year 2003 gave the birth to the UNFPA and its partner's global Campaign to end fistula, which Nigeria is an active member and a beneficiary. Apart from treating and rehabilitating VVF survivors, the campaign also support the training of Health care workers ranging from Surgeons to community health care workers, all in the effort to tackle VVF (42).

Till date, Nigeria is fully determined to achieve the goal of eliminating VVF by the year 2030, which is in tune with the Sustainable Development Goal (SDG) agenda. The country through the Federal Ministry of Health, had developed 2 National Strategy Frameworks for Fistula elimination from 2005-2010 and then 2011-2015. Some important progress made thus far include inclusion of budgetary allocation in the National budget to fund fistula programs, training of health workers and establishment of more fistula treatment and rehabilitation centers where almost 3,000 VVF patients are treated annually either at a subsided fee or free (1).

Currently, there are 12 fully-dedicated centers, distributed across all the 6 geopolitical zones or regions in the country for the treatment and rehabilitation of VVF survivors. They are 6 in the North-West (Sokoto, Kebbi, Zamfara, Kano, Jigawa and Katsina states), 2 in the South-East (Ebonyi state), and 1 in each of the remaining South-South (Cross River state), South-West (Oyo State), North-Central (Kwara state) and North-East (Bauchi state) geopolitical zones. There are also other centers designated as supporting centers for VVF cases (3)(43). Presently, there is a new Strategic framework for fistula elimination, programmed to last from 2019-2023 with a goal of achieving a fistula-free Nigeria by contributing 30% reduction in incidence, 30% reduction in prevalence and an increase of 30% for those undergoing rehabilitation, all within the 4-year period.

2.2 Justification

The number of women living with VVF in Nigeria remains persistently high and the number of new cases keeps rising, it is very important to explore, identify and address the root causes and the determinants of the problem within the Nigerian context. Previous National Strategic frameworks for the elimination of VVF all elapsed without any concrete evidence of achieving any goal of eliminating or reducing VVF in the country. This could be due to the fact that there were mainly focusing on the treatment, training of Health workers and rehabilitation of VVF patients and not concentrating enough on the factors or determinants influencing the problem in the country.

Even with the current efforts in place, less than 4,000 VVF patients are surgically treated annually across all centers in the country. This translates to a fact that, it will take about a century to treat those currently living with the problem, not to talk of adding new cases(1). Knowledge gaps seems to exist about VVF in Nigeria as information about the problem of VVF

in Nigeria is scattered and not put-together in one piece. Looking at these scenarios, it is pertinent to not only focus on treatment and rehabilitation of VVF women but there is also the need to focus more and analyze the determinants that affects the problem in the country(44).

This thesis works aims to collect, bring together and analyze the determinants and responses to the problem of VVF in Nigeria and also to come up with an overall picture and recommendations to aid the Ministry of Health and other stakeholders in making and adopting policies and guidelines towards elimination of VVF in Nigeria.

2.3 Study Objectives

2.3.1 General objective

To describe and analyze the determinants and responses to the problem of VVF in Nigeria aiming to give recommendations to the Ministry of Health and all stakeholders for better policies and guidelines in the prevention and care of patients with VVF in Nigeria.

2.3.2 Specific Objectives

1. To describe the magnitude and consequences of VVF in Nigeria.
2. To analyze the determinants of VVF influencing the problem of VVF in Nigeria.
3. To identify and analyze interventions that could potentially be used in the Nigerian context with the aim of reversing the trend and effects of VVF in Nigeria.
4. To give recommendations to the Ministry of Health and all stakeholders for better policies and guidelines in prevention and are of women with VVF.

2.4 Methodology

The thesis is going to be carried out by doing literature review of relevant articles. Search engines namely PubMed, MeSH, Google, Google scholar will be employed as well as KIT/Vrije Universiteit (VU) virtual library will be used in fetching relevant books and articles. Information obtained from grey literatures of relevant and recognized local and international organizations include but not limited to Nigeria's DHIS, Federal Ministry of Health, WHO, UNICEF, UNAIDS, World Bank, CIA, UNFPA, FIGO. Internationally recognized and relevant journals including AJOL, BMC, BMJ, PLOS ONE, Fistula-Plus, were all included in this exercise. Also, while snowballing through initial literature, quite a number of relevant articles were found, reviewed and used in this article. Only articles in English Language, within the last ten years were used. Personal experience of the author as a medical practitioner working in Nigeria was also used as information source.

Keywords and combinations were used in the search engines using the Boolean search strategy as depicted in the figure below Keywords as well as the inclusion and exclusion criteria are given in table below.

2.4.1 Inclusion Criteria and Exclusion Criteria

The inclusion and exclusion criteria applied in this work is given in table Below.

Table 1 showing Inclusion and exclusion criteria

Inclusion criteria.	**Exclusion criteria.**
• Articles, journals and papers published in English language. • Articles with publication dates ranging from the years 2010-2020. • Information from studies in other Sub-Saharan countries with similar disease pattern with Nigeria. • Vesicovaginal fistula. • Obstructed labor.	• Articles in any other language apart from English. • Older articles that are published more than ten years ago • Information from duplicate studies were also excluded. • Rectovaginal fistula. • Uterovaginal fistula.

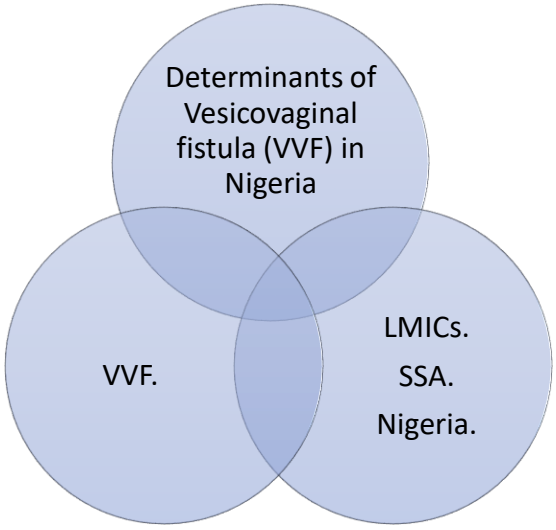


Figure 4 showing The Boolean search strategy

2.4.2 Search Strategy

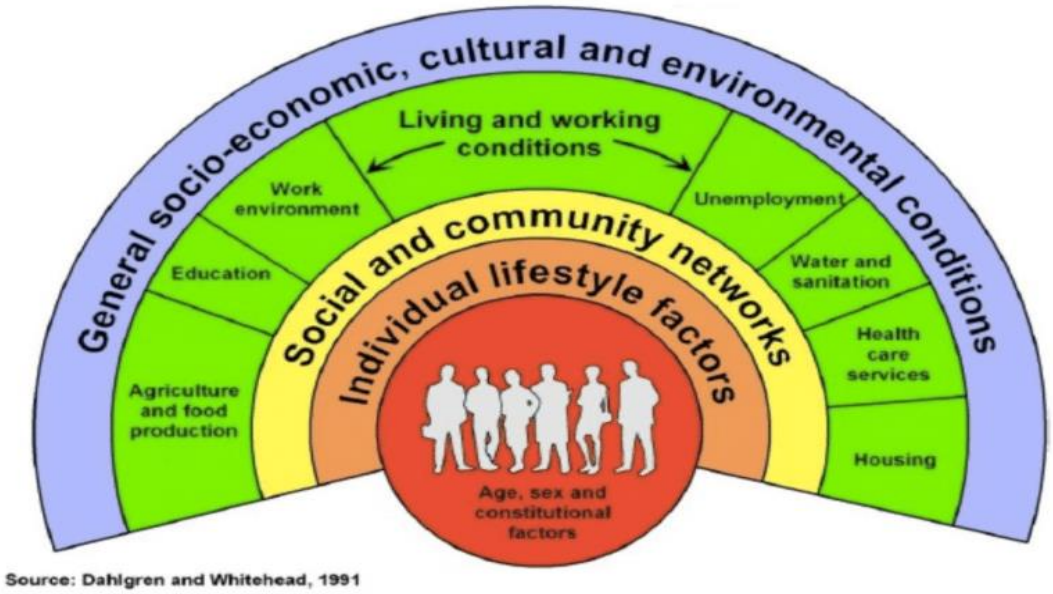
Table 1 Search strategy/strings used in the literature review

	AND		
Objectives	Search term	Keywords	Geographical area.
1. Magnitude and consequences of VVF in Nigeria	• Vesicovaginal fistula. • Obstetric fistula. • Obstructed labor.	• Prevalence. • Incidence • Physical consequences • Social consequences • Psychological consequences • Economic consequences.	• Low-middle-income countries (LMICs). • Sub-Saharan Africa (SSA). • Nigeria.
2. Determinants of VVF influencing the problem of VVF in Nigeria. (Using the Dahlgren and Whitehead framework).	• Vesicovaginal fistula. • Obstetric fistula.	• AND Age. AND [Individual lifestyle OR use of contraceptives]. • AND Social support. • AND [Community network OR support]. • AND [agriculture OR food OR malnutrition]. • AND [education OR literacy]. • AND [unemployment OR poverty]. • AND [water OR sanitation]. AND [health care services OR health care access]. • AND economy. • AND [culture OR tradition OR ethnicity OR religion].	• LMICs. • SSA. • Nigeria.

2.4.3 Applied Conceptual Framework

In this thesis, the conceptual frame work for the determinants of health by Dahlgren and Whitehead (figure below) will be used to analyze the thesis objectives.

Figure 4 Showing the Dahlgren and Whitehead framework



Source: https://esrc.ukri.org/about-us/50-years-of-esrc/50-achievements/the-dahlgren-whitehead-rainbow/

The frame work is also called the 'rainbow model'. It was developed in 1991 by Goran Dahlgren and Margaret Whitehead and since then has been used widely by researchers. It was chosen for this thesis work because disentangle a wide range of determinants that threaten and promote health and is also appropriate for preparing interventions in the process of policy making. It demonstrates the important inter-relationship that exists between individual, society and community, living and working conditions, general socio-economic, cultural and environment conditions interacts with and affect health. It also creates an avenue for analysis of the various determinant of health in an arranged, systematic way as well how these are intertwined with one another and thereby further clarifies on the processes by which determinants of health generate health inequities within and outside communities and thus helps in mapping out specific level of interventions (45), though it does not right away provide an approach for the intervention aspect of the objectives.

The framework outlines four (4) intervention levels and one level that is uncontrollable, which is age, sex and constitutional factors. The levels/layers of the framework are as follows;

1. Age, sex and constitutional factors.

2. Individual lifestyle factors level and deals with obesity, diet, cigarette smoking and alcohol.

3. Social and community network level- deals with interpersonal relationships, social support, stigma and discrimination.

4. Living and working conditions which deals with unemployment, poverty, agriculture and food supply chain, education and health care services.

5. General socioeconomic, cultural and environmental conditions that deals with the socioeconomic status of the people, cultural practices, power and gender roles, traditional and religious practices.

Components of the framework excluded are agriculture and food production, work environment, water and sanitation, housing. No association to the problem VVF was established in the literature search

Other Frameworks considered but not used in this work include The Frieden model or Framework. Frieden model is a 5-tier pyramidal framework and focuses more on public health interventions, policy-making or decisions rather than the analysis of the various social determinants. It is more of an action-oriented framework.

The WHO-CSDH Conceptual framework is another framework with primary focus area on policy development and decision-making. It consists of 2 components which makes it extensive, and must be put together in order to define the inter-relationship between the various determinants of health. The downside of using it is, the findings will be vast rather than in-depth.

2.4.4 Limitation of the Study

There is limitation of information needed in analyzing all the determinants of VVF within the Nigerian context using the conceptual framework. Thus, reports from other Sub-Saharan countries were used because they seem to share totally similar disease pattern with Nigeria, as well as the determinants Also, data and articles for individual state analysis in the country were scanty and very limited. Hence, in some instances, data from a certain state or geopolitical zone in the country was used generating inference with caution in the analysis of the problem of VVF in Nigeria.

CHAPTER 3

RESULT/FINDINGS

3.1 Magnitude

Despite being a huge public health problem in the country, it is not given the needed attention with associated paucity of accurate and reliable data(1). Currently no large studies were carried out in the country to ascertain its precise incidence. Notwithstanding, available estimates put the incidence rate at 2.11 per 1000 deliveries with 12,000 new cases every year(3). This however, could go as high as 20, 000 new cases or more every year owing to the fact that only about 38% of childbirth occur in a health facility, with majority, about 62% are taking place outside a health facility(46)(2)(36).

The prevalence rate is 3.2 per 1000 deliveries(1). The Northern parts of the country have a higher prevalence rates than in the Southern parts of the country(1). To be more accurate, the prevalence rate in North-central is 0.8%, 0.5% in the North-East and North-West having the lowest in the northern region with 0.3%. On the contrary, the South-south region of Nigeria has the highest in the region with a prevalence rate of 0.5%, then 0.3% in the South-east and South-west region having the lowest with a prevalence rate of 0.2%(3). This high magnitude means that, about 150,000 out of the total 37,425,000 women of the reproductive in Nigeria either had VVF or have experienced fistula symptoms in the past(3). In a study, it was revealed that women in the age range of 10-18 years constitute the peak age range of VVF in Nigeria and as high as 58%-90% was seen in the northern states of Sokoto (90%), Kano (75%) and Borno state (59%)(27), while the age range of 20-29 years constitute the highest frequency of VVF occurrence in the southern regions of Sagamu, Ogun state (58.3%) and Port Harcourt, Rivers state (27). This variation in peak ages could be explained by early marital practices in the northern states and will be discussed later in the following sections.

3.2 Consequences

Women with VVF faces a lot of consequences of the diseases and suffers much more than just physical pain or leakage of urine. These consequences ranges from physical pain to serious emotional and psychosocial issues. In this thesis and for the sake of better understanding, the consequences of VVF are grouped in to **physical, social, psychological** and **economic** consequences.

3.2.1 Physical Consequences

Continuous leakage and associated urine stinking are common to all women with VVF which they suffer following the complex and painful mechanism they had during childbirth. This makes them to stink and also difficult to mingle with other people. Though some women may try to arrest this involuntary leakage by using rags from cloth or pads, it always ends up in vain and

just increases their vulnerability to urinary tract infection due to ascending infection and excoriation of skin of the vulva(47)(48). A study in Kano, Nigeria shows as high as 31% of VVF patients have this skin dermatitis(27). This infection can affect the kidneys and cause severe renal impairment. Unfortunately, even after surgical repair of fistula, urinary incontinence will persist in about 14%-30% of VVF survivors(40)(49).

Similarly, Peroneal nerve injury due to obstructed labor can lead to difficulty in walking and other gait abnormalities(48). Few studies were carried out and there is little literature on this in Nigeria. However, in one of studies conducted in VVF center located in Sokoto State, it was found that 59.2% of women (106 out of 179 women) had foot drop(50). In another similar carried out in Ethiopia, it was also found that about 20%-30% of those with VVF have walking problems due to foot drop(51). This cause them to drag their legs while walking, limp or can only walk with the aid of a walking stick.

Another problem is the issue with fertility. Only about a quarter of VVF survivors especially in those that suffer VVF in their first childbirth, usually have stillbirth and experience difficulty in trying to conceive or have another baby in the future(48). A study in Sokoto VVF center shows about 63% of the patients have secondary amenorrhea, making it rather difficult for them to conceive pregnancy later on(50)(52). This is a problem in societies that attach affluence to having large families or where having a very large family is the main source of reliable and affordable labor like in agriculture, as typically seen in many Nigerian communities(47).

3.2.2 **Social Consequences**

Apart from physical consequences, VVF patients also experience serious forms of social injustices as a result of their condition. These include rejection from the community like banning them from social gatherings, isolation, minimal social support and in some cases, rejection or divorce from their spouse(52). This is all because of the smell of urine due to incontinence. In the typical Nigerian setting where the worth of a woman is dependent on carrying out house chores and satisfying her husband's sexual needs and childbearing, the condition can make her life a difficult one by facing maltreatment from the husband and marginalization by the family members and the community at large, especially in those communities that attribute the condition to supernatural causes or believe VVF is a punishment from Gods(53). This is the case that was found in the Sokoto VVF center where 55.6% of VVF patients attributed their condition to evil supernatural elements and 33.3% consider it a punishment from God(35).

Divorce is the commonest social discrimination faced by VVF women throughout the country and is as high as 55% especially in the northern states like Sokoto(27). Another study in Akwa, Ibom state and Ilesha in Ogun state in Southern Nigeria show more than 60% of VVF survivors are divorced due to their inability to duly perform their conjugal duties due to pain they experience while having sexual intercourse with their husbands and sporadic leakage of urine

even post-surgical repair(54)(55). Some are sent back to their parents or care-givers, while others seek refuge in institutionalized centers like religious homes(54). These all make them to have a perceived feeling of shame, humiliation, isolation and low self-worth.

3.2.3 Psychological Consequences

It is not surprising that VVF patients have a lot of psychological problems looking at the high still-birth rates of 75%-92% associated with the condition and in many times, the psychological conditions are more traumatic than actually having a fistula(27). Psychological conditions like depression, Post-traumatic stress condition, other somatic complains were found to be higher in VVF patients in contrast with the other woman(52). A study from Ethiopia reported that 100% of VVF survivors on arrival to a health facility have one form of psychological problem or the other with 40% of them previously considering suicide(56).

The Nigerian scenario is almost no different. One study done in Enugu, South-eastern Nigeria shows that depression is the commonest (73.8%) psychological problem faced by VVF patients(57). Similarly, in the Northern state of Sokoto VVF center, it was found that 104 out of 179, about 58.1% of VVF women were found to be having depression(50). Post-traumatic stress disorder (PTSD) is common in about 65% those screened with VVF(58). The culmination of these effects renders the patients vulnerable to ideas of deliberate self-harm, stress, anxiety and sometimes committing suicide(41)(53).

Despite all this, VVF survivors in Nigeria create coping and survival strategies in the face of their sufferings. These include using rags from torn clothes or pads to absorb the moisture from the urine leakage, frequent bathing, attending religious crusades and seeking solace from religious leaders.

3.2.4 Economic consequences

VVF survivors also faced economic hardship due to family and societal rejection and isolation they experienced as a result of their condtion, hence could not get the opportunity to be gainfully employed except for low-skill, petty trading(48). From a study done in Sokoto, it was found that 61% of VVF patients were not gainfully employed or full-time housewives while the remaining 39% were involved in home-based petty trading(27). As they are rejected by their spouses, family and community, they faced a lot of financial hardship and to over come this, they engage in small scale domestic businesses like selling of firewood and other petty trading not just as a coping strategy, but to also cater for of their financial needs(53)(59).

3.3 Determinants of VVF in Nigeria

These results were obtained using the Dahlgren and Whitehead framework. Only components of the Dahlgren and Whitehead framework that relates to the problem of VVF in Nigeria were used in the analysis. Components of the framework excluded are agriculture and food production, work environment, water and sanitation, housing. No association to the problem VVF was established in the literature search.

3.3.1. Constitutional Factors.

3.3.1.1 Sex.

Since VVF is a majorly a complication of obstructed labor which happens only in women that were pregnant, being a female is a determinant.

3.3.1.2 Age at first intercourse/childbearing

In many SSA countries including Nigeria, marriage is an important milestone in a woman's life because is the moment when conceiving and childbirth are considered to be socially acceptable. Early marriage equates to early exposure to coital activities leading to pregnancy, at a period when the young girl is neither physically nor sexually aged(60), especially in Nigeria where fertility rate is high(1)(2)(27). Young girls are married off by their family members or care givers at a very young age, sometimes immediately after their first menstrual bleeding (menarche). This is mostly based on tradition and religion and not backed by any civil law(60). Nigeria's median age at marriage is 18.1 years in those aged 25-49 years and pregnancy rates among is 23%(1), though women in rural areas marry four years earlier than those in urban areas (16 and 20.8 years respectively)(2). These figures however do not reflect on the variations that exists across the national geopolitical zones. The lowest median age at marriage, 15.3 years is found in the Northwest zone while in the South-east zone, the median age at marriage is 22.7years(2). The NDHS data in 2018 reported that about 19% of women aged between 15-19 years had either commenced motherhood or had experienced pregnancy in their life(61). Higher rates were found to be in the North-western and North-east states of the country, where 53% was found in Katsina state alone(1).

In the Northern states where the burden of the disease is highest, most (50%-80%) of the VVF patients were married at an early age. As study shows that in Kano and Borno states, 81.5% and 52.3% respectively of their VVF patients were married at the age of 15 years. While in Sokoto state, more than 90% of their VVF patients were married before attaining the age of 18 years(27). This is even below the median age at marriage in the country.

In many LMIC setting including Nigeria, early marriage, early sexual exposure and subsequently early childbirth are closely interrelated and as a result, may increase their risk of developing VVF (60)(62). A similar result was seen in a pooled analysis of SSA countries which shows that,

early age of first intercourse or childbirth promotes the chances of developing VVF(63). Thus, early age at first intercourse and childbirth has a positive association with VVF. Reasons for this practice include fear of poverty by the parents or care givers as there will be less family member to feed and cater for, preservation of virginity or 'purity' of the girl child, peer pressure on the parents from the society, and perceived prevention of promiscuity among young girls (64)

3.3.1.3 Maternal Height/Short stature

The relationship between maternal height and small maternal pelvis has been shown in very few studies carried out, which affirmed it to be a negative factor. No data of this in Nigeria was found. However, in other African countries like Ethiopia and Ghana, it was found that women with a height of less than 150cm stands the risk of cephalopelvic disproportion, a complication that can lead to obstructed labor and subsequently VVF(65)(66)(67). In the study it was shown that about 52% of the VVF patients in Ethiopia are below the height of 150cm(68). In comparison, the average height of women in Ethiopia is 158cm(69).

3.3.1.4 Nutritional status

Nutrition affects the overall growth and of an individual and could play a role in pelvic maturity(63). Lack of vitamin and calcium could result in potential undeveloped pelvis which could predispose to obstructed labor and then VVF(60). Nigeria is the country with second highest burden of children with stunted growth and severe acute malnutrition, with a prevalence rate of 32% and about 2,000,000 children under the age of 5 years have stunted growth(70). Lack of adequate nutrition leads to growth stunting. Data from the 2018 NDHS shows that 12% of all Nigerian women of reproductive age (15-49 years) have a body mass index (BMI) of 18.5, signifying being underweight(61). Inadequate nutritional intake during childhood and early adolescence period leads to short stature in women. This leads to small and undeveloped pelvis, which of course is an important risk factor of poor or bad obstetric outcomes including obstructed labor, the main cause of VVF in the country(2)(68)(71).

Thus, inadequate nutritional intake influence negatively the development of underdeveloped or deformed pelvis which in turn can lead to obstructed labor and VVF.

3.3.2. Individual Lifestyle

3.3.2.1 Use of contraceptives and Family planning

The importance of the use of contraception and family planning methods has been established as a critical step in the prevention of all forms of obstetric fistulas as well as reduction of maternal morbidity and mortality. Obstructed labor, the commonest cause of VVF in our settings, can be prevented by delaying pregnancy especially in those married off at an early age(72)(73). Even with a high fertility rate (5.5 births per 1,000 population) only 10% of women of reproductive age (15-49 years) use modern contraceptives, though 85% of and 95% of women and men

respectively are aware of it.(1)(2)(27). Only 9% of rural dwellers where the cases of VVF are common have access to and use family planning or contraception services(2). In study done in National obstetric center, Katsina, one of the high burden areas, shows only about 28% of the VVF patients are aware of what family planning and contraception methods are(72). This finding is lower than the one earlier reported by the NDHS which stated 84%(2).

The low level of use contraceptives and family planning methods can be said to be drivers of the problem of VVF in Nigeria.

3.3.3. Social and Community Networks

Literature for Social and Community networks and VVF could not be found. However, from the author's experience while working in one of the VVF centers, health care workers in these health centers are the ones who provide social support for the patients. They create a small discussion group session for them and educate them on their conditions and ways to prevent its occurrence in future. Similarly, the state Ministry of Health provide them with all their health needs, including family planning and contraception services.

3.3.4. Living and Working conditions

3.3.4.1 Education/Literacy/Awareness

The relationship between education, awareness and timely usage of orthodox health care services has been established by several studies. The current literacy rate of Nigerian women of reproductive ages is about 53%, more in the urban areas with 77% than the rural areas having 36%(2). This however, masks the huge discrepancies that exists in the states of the country's geopolitical zones. While none of the states in the South has less than 80% literacy rates, the Northern states have the lowest rates with 26% and 28.3% in the North-west and North-east respectively(2). Education has been shown to have a positive effect on a woman's health-seeking and decision-making abilities, willingness to patronize and utilize hospital-based health care services, as well as to have economic autonomy(74). It also empowers women with the ability to overcome and resist harmful cultural norms in the society. Despite the Government's effort in providing and declaring free and mandatory universal basic education in the country(15), girl-child education is controlled, because once a young girl becomes a teenager, she is considered suitable for marriage and is subsequently given out in marriage thereby limiting her educational progression(75). Also, preference for education is given to male child than that of a girl(68). The outbreak of the terrorist group, Boko Haram in the Northern-eastern Nigeria also impacted negatively on the educational profile of the country, as of their sole purpose is to prohibit all forms of formal education by attacking students and teachers, sometimes even killing them. This causes disruption to educational access in the country(6)(15).

Unfortunately, more than 70% of all VVF patients who present to a health facility in Nigeria are lacking formal education(27), and are not aware of what fistula is, that fistula is treatable or the place to go for aware of the need for delivery in a health facility (35)(76). In a hospital-based study, about 6.5% of the VVF patients were found to be lacking awareness on the availability of a health center for VVF cases(27).

Education leads to delay in marrying at an early age and subsequently early pregnancy, reduces desire for large family size and decrease the chances of getting VVF by 13%(62)(74). Hence, education is a determinant and has a protective effect on young girls and women.

3.3.4.2 Poverty

Poverty is an important determinant of VVF affecting Nigerian women, as VVF is mainly found in the poorest and remote regions of the world(77). Poverty greatly restricts women's access to hospital-based antenatal and delivery care services, as it serves a financial barrier for women to attend antenatal care (ANC) or deliver in a health facility(78). As of 2018, national poverty rate is 40.1%, with women constituting 70%-79% of the national poverty rate. The rural areas where high burden of VVF is, has a poverty rate of 52%(79)(80). They are from rural and remote areas, who cannot afford to pay for transportation to hospital facilities, not to talk of affording hospital services. In Nigeria, about 70% of health expenditure is mainly out-of-the-pocket payment, hence adding more financial burden(81). Thus, being poor has a negative effect in the development of VVF.

3.3.4.3 Unemployment

A strong positive relationship exists between unemployment and poverty, as revealed by a Nigerian study(80). When an individual is unemployed, the effect is continuous waning of his or her living standard and incapacity to meet the need of his household. As of 2018, Nigeria's unemployment rate stands at 23%. Many of VVF patients are women with no employment and usually from poor family background, compared to their wealthy peers(78)(80).

3.3.4.4 Health-care services

Inequity in the distribution of MCHS and EmOC services is a determinant that undesirably influences VVF in Nigeria, as services are concentrated in the urban areas than in the rural areas where they are most needed(34). Women living in remote areas lacking accessible and affordable maternal health care services (MHCS) are the ones largely affected by VVF as only 41% of them in the lowest wealth quintile have access of Antenatal care (ANC) and BmOC(82). There is also lack of facilities that is not restricted to equipment and supplies, many health facilities in Nigeria also lack skilled Doctors and other trained healthcare personnel to render EmOC services(76). In Nigeria, only 4% of public health facilities meets the standard requirement for rendering EmOC(82).

Affordability is another barrier to the utilization of MCHS by pregnant women in the country, where many people cannot afford basic healthcare services(83). Though the NHIS was launched more than two decades ago, less than 5% of the total population and only 2% of women within the reproductive age range were enrolled(2)(84). This reason constitutes some of the explanations why hospital-based deliveries in the country are very low with a rate of 38%(36). Delivery in the presence of skilled birth attendant is low in Nigeria, about 43% and 66.3% of women attend hospital ANC at least once, while 58.7% have at least four visitations(85). Delivery in the presence of traditional birth attendant (TBA) constitute 70%-75% of all deliveries in Nigeria, with figures higher in the rural settings(85). TBA do not offer any ANC, rather they are called when a woman is in labor to assist and deliver the baby, cut the umbilical cord and dispose the placenta(86).

The perceived quality of care and bad attitude of health care providers can affect the health-seeking behavior of VVF patients and cause delay. Some health personnel have diagnostic challenges, poor communication skills, which some patients may consider as verbal abuse or some see VVF patients as a low priority case(76). Furthermore, perceived bad attitude or behaviors of health care providers can hinder effective utilization of reproductive care services in health facilities (87). Long queues and waiting hours before a patient sees a doctor leads to overcrowding and perceived time-wasting, all negatively affecting or hindering attitude towards seeking healthcare in a hospital(87).

3.3.5. General socio-economic, cultural and environmental conditions

3.3.5.1 Socio-economic status

Low socioeconomic status (SES) has been shown to be negatively linked with many negative health problems including increased maternal mortality and morbidity(88). VVF is a disease of poverty and majorly affects the most marginalized women and young girls in the society, especially those living in remote places with very limited accessibility to affordable MHCS(25)(34). VVF studies done in Nigeria indicates that more than 55%-89% of VVF patients have a low SES and mainly subsistent farmers (27)(32). Low SES also has a negative impact on the timely health-seeking behavior among people. High SES is associated with high education level which empowers women to seek and utilize better health care. Low SES deters women accessibility to affordable MCHS and in those with VVF, can exact a great deal of financial burden on them(81).

3.3.5.2 Cultural factors

There are cultural and religious practices in Nigeria harmfully affects and contribute to the high prevalence of the problem in the country. These practices are early marriage, female genital mutilation/cutting, ‘yankan gishiri’ or ‘gishiri’ cutting and suppression of women/gender issues.

3.3.5.3 Early Marriage

Early marriage, defined as the betrothal of a girl or boy before the age of 18 years(89), is a common practice among many ethnic groups in Nigeria, but is practiced more predominantly among Hausa- Fulani ethnic group, of Islamic faith, in Northern Nigeria(90). As highlighted in the previous section, reasons for this practice include fear of poverty by the parents or care givers as there will be less family member to feed and cater for, preservation of virginity or 'purity' of the girl child, peer pressure on the parents from the society, and perceived prevention of promiscuity among young girls (64)

A study conducted in the north east Nigeria shows that, about 84% of those with VVF developed it before attaining the age of 15 years and 97% of them experienced obstructed labor after getting married at the age of 14 years or younger(60). The notion used by the Northerners that early marriage is associated with the religion of Islam could be due to lack of awareness, as Islam is strongly against harming girl child through early marriage(91). There are also many Muslims in other regions of the country but studies have shown that they do not engage in early marital practices(68). This shows that, there is misunderstanding in those that based their reasons on Islamic religion as the justification of their early marriage practice. As a result, early marital practice is a driver in the development of VVF.

3.3.5.4 Female Genital Mutilation/cutting and Yankan gishiri

Female Genital Mutilation (FGM), is the partial or complete removal of some parts of the female external genitalia for non-medical reasons and mostly done by traditional or local healers(92). It is carried out on young girls between the ages of 0-15 years and is based on ethno-cultural or religious beliefs including maintaining chastity, reducing promiscuity in the girl child , social acceptance and as a ritual for initiation of the girl child into womanhood(93). Nigeria currently having the third highest number of women with FGM in the world with 19.9 million cases, just behind Egypt and Ethiopia(94). In Nigeria, the highest prevalence of this tradition is seen in the South-south states of the country with 77%, however, the most severe form of it, which is the excision of labia and clitoris and then suturing the edges of the cut vulva to coitus), is found in the Northern states(95). The correlation between this harmful traditional practice and VVF has been debated in many studies, and only few studies establish this association. One of the few studies reveals that FGM is responsible for 2%-13% of VVF cases in northern Nigeria(60). Main reason why it's done in the north is the belief that FGM is an obligation in Islam. However, no evidence exists in the Muslim Holy book or any scripture confirming or recommending such act(96). In fact, the practice of FGM does not have a place in any religion(97).

'Yankin gishiri' is another harmful traditional practice among the Hausa-Fulani in Nigeria and can also lead to urinary incontinence and VVF. Unlike typical FGM, it is done on a woman with obstructed labor at home by a traditional healer, using a sharp knife or blade, to cut the pelvic outlet/vagina with the aim of increasing the passage for the delivery of the baby and this can lead

to VVF. Same study also shows that about 30% of women who experienced this procedure, later on developed VVF(60).

3.3.5.5 Status of women in the society

In many societies in Nigeria, women are expected to be in subordinate positions and only to be engaged in unskilled or semi-skilled, low-paying jobs(76). For instance, in the northern states of the country, women are expected to remain hidden, submissive, marginalized and totally under the control of their husbands, parents or other caregivers(68). Only about 31% of currently married women partake in the decision-making and other health-related decisions pertaining their health, like attending ANC and child delivery in a hospital(2). They are subjugated and do not have autonomy. They have to seek permission from their husbands or care givers to seek care in a health facility, they have no access to their finances and have to rely on their husbands or care givers to pay for hospital services rendered to them(68).

3.4 Interventions that could potentially reverse the trend of VVF in Nigeria

According to the WHO, interventions to prevent obstetric fistulas, for which VVF is among, contributes to SDG's goal 3 in maternal health improvement(98). This can be done through; delaying the age of first pregnancy, the cessation of harmful traditional practices, timely access to good quality and affordable obstetric care(98), as well as gender inequality.

3.4.1 Delaying the age of first pregnancy

As highlighted in the section above, early marriage and subsequent early teenage or adolescent pregnancy are important determinants of VVF in Nigeria. Avoiding and delaying teenage or adolescent pregnancy until a girl is at least 18 years of age, not only have a protective effect against maternal morbidity and mortality, but also improves the chances of having a healthy baby(99). A study of obstetric fistula in SSA shows that if adolescent pregnancy or childbirth (and early marriage) is prevented or abolished, the ensuing complications of childbirth like obstructed labor (and subsequently VVF), as predicted would be reduced in Niger by 11.2%, in Nigeria by 11.4% and in Tanzania by 13% (100).

One of the interventions that could potentially prevent and reduce the burden of VVF in Nigeria is by strengthening and enforcing strict laws against child marriages. The Nigerian government adopted the Child Right Act in 2003, setting the legal age of marriage at 18 years. However, this is ineffective as it can only be effective if the states in the country also adopt the same act.(44). As of 2016, out of the 36 states in Nigeria, only 23 states have adopted the act. In many Northern states where VVF burden is higher, the Sharia (Islamic) system of law is the one responsible for handling marital issues. And to many Islamists, marrying a minor is allowed once she attains menarche. This however, is contradictory to the Nigerian constitution and the Child Rights Act and contrary to Islam as well(44). Thus, without strengthening and enforcing these laws, child marriages will continue to happen.

Another promising intervention of delaying early pregnancy and subsequently VVF, is by promoting the education of the girl child(1). As seen from above, over 70% of all VVF patients who presents to a health center in Nigeria lack formal education(27). There is a strong positive relationship between the literacy level of young women and early pregnancy. The higher the educational level of women between the ages of 15-19 years, the less the chances of early pregnancy and early childbirth(101). Study conducted in North-Eastern Nigeria reveals that, in 96.3% of VVF cases, lack of education was found to be a contributing factor(100). A similar study done in Cameroon shows 81% of their VVF cases had no formal education(100). Education reduces or prevents child marriage and adolescent pregnancy/childbearing by increasing girl's awareness of their sexual and reproductive health including use of modern contraceptive methods, better livelihood and ability to partake in proper decision-making involving their health and general wellbeing(74)(101).

3.4.2 Cessation of Harmful Traditional Practices

Some traditional practices like FGM and yankan gishiri can be seen to be determinants of the problem of VVF in Nigeria. Hence, interventions aimed at preventing or reducing these practices would invariably help in reducing the burden of the disease. The Nigerian Government in 2015 passed legislation called Violence Against Person Prohibition act (VAPP), including FGM, however there is laxity in enforcing the law only 13 states out of the 36 states (4 in the northern region and 9 in the southern region) in the country enacted this legislation(102), leading to persistent prevalence of the practice in the country. Evidence from countries like Eritrea shows that strict legislation and robust monitoring can accelerate the decline of the practice, as seen in some states of the country(103). Overall, strict legislation has decreased the national prevalence of FGM in Eritrea by 12.9% in those aged less than 5 years and by 33% in those aged 15 years of age(103). Strict laws against FGM will not be enough as there is the possibility that some people might continue the practice underground. Thus, the challenge is to develop and implement a legislation framework that will promote a societal and social change process that will eventually lead to stoppage of FGM in the communities(104). Additionally, they should also be laws against medicalization of the practice in some communities, as it accounts for about 12.7% FGM practice in Nigeria(105).

3.4.3 Gender Equality

Again, many women especially those from VVF high burden areas faces a lot of gender inequality. For example, women in northern states in Nigeria are expected to always be totally submissive to their male care givers or husbands and lack any power when it comes to decision-making, autonomy or economic independence(68). The influence of gender norms has been highlighted in studies and shows that, women with more autonomy and have power in decision-making are more likely to have a better health-seeking behavior and as well make better utilization of hospital-based health care services, than their counterparts(106). Thus all polices and interventions that promotes gender have the likelihood of decreasing the burden of maternal

morbidity and mortality(106). Another study also shows that, in many African countries, the promotion of gender equality, in addition to educating girl child and poverty alleviation, can invariably empower women to seek for, access and utilize hospital-based health care services(107).

3.4.4 Timely access to good quality and affordable obstetric care

Health-system based interventions like provision of improved antenatal care, EmOC services including timely cesarian section for women with obstructed labor have been found to be helpful in preventing and curbing the menace of VVF (100)(108). According to studies, one of the ways by which accessibility can be improved to health facilities to those in the remotes areas is by the use alternative transport systems like bicycles and motorbike ambulances(109). Improving access to MCHS through this method has been shown to positively affect maternal and child health indices in LMICs. In Malawi, a study done shows that, in three years after the adoption of use of motorbike ambulances, there was an increase of hospital deliveries from 25%-49% and a reduction of maternal mortality from 586 to 235 per 100,000 livebirths(109).

Another intervention to reduce the burden of geographic accessibility is by using maternity waiting homes (MWHs). These are residential homes or facilities situated near a qualified health facility, where women identified with “high risk pregnancy” can live, awaiting their delivery and also can be referred to a nearby health facility just before delivery or promptly, should there be any complication(110). They serve to bridge the gap between poor-resource communities and urban areas with better-equipped health equipment. As an intervention, it has shown to increase not just delivery in health facility but also uptake of family planning(111). As evidenced by a study done in Zambia, there was an increase in hospital-based delivery from 55% to about 62% by women living in an area with MHW than their counterparts living in an area with no MWHs(112).

Apart from improving access, improving the quality of care given by HCWs is an important intervention to reduce VVF cases in Nigeria. One of the ways is by conducting and ensuring continuous training and retraining of skilled birth attendants on EmOC in health facilities, including the identification and (possible) referral of complicated pregnancies, appropriate usage of partograph in labor monitoring and other conditions that can cause complications during childbirth(100).

In communities where there is shortage of HCWs, task shifting to lower cadre of health staff can be implemented to potentially bridge this gap(100). A study shows that task-shifting can be employed to boost productive efficiency in health care service delivery, reduce the shortage and lack of HCWs in remote areas, reduces skill-mix imbalance and also at relatively lower cost thereby reducing financial barrier to seeking health care(113).

CHAPTER 4

DISCUSSION

4.1 Discussion

This literature has looked into the magnitude of VVF in Nigeria together with consequences, the determinants that influence it Nigeria and interventions with the potential to reverse the current trend in the country.

VVF though preventable, remains a disease of significant public health concern in Nigeria. It is prevalent in many resource-poor settings in LMICs. Exact incidence and prevalence in Nigeria are unknown and cumbersome to get due to inaccessibility of areas with high burden with the disease. But available data put VVF incidence in Nigeria at 2.11 per 1,000 and national prevalence rate at 3.2 per 1,000 deliveries. Though there are differences across all the six geopolitical zones, with states in the Northern geopolitical regions having more cases than the states in the southern region. Women with VVF suffer from several physical, social and psychological consequences.

The determinants of VVF in Nigeria can be seen to be intertwined and interlinked and are not independent of one another. Early age at marriage and subsequent adolescent/teenage pregnancy was shown to be a huge determinant to the development of VVF in the country. Many patients, especially in northern Nigeria are teenagers and studies show the average age of patients are 13 years in Sokoto, 17.5 years in Maiduguri, while patients in the Southern states in Nigeria, patients are older with 26.8years, 29.3 years and 30.2 years in Port Harcourt, Ilorin and Sagamu respectively. Early marriage is predominantly practiced in the northern states in Nigeria where young women are married off immediately after menarche. This is further complicated by the low-level uptake of modern contraceptive use. In Nigeria, contraceptive uptake in women within the reproductive ages in 10%, though there is high level of awareness among both men and women (85% and 95% respectively). Early marriage with low level of contraceptive use ultimately leads to early pregnancy at a time when the maternal pelvis is not fully developed to accommodate and withstand the processes of childbirth. This predisposes them to prolonged obstetric labor and subsequently VVF.

Maternal height and stature are also linked to VVF, though no Nigerian data showing this relationship was found during the course of this work. However, according to studies in Ethiopia and Ghana, maternal height of less than 150cm are prone to develop VVF. Short stature can be a result of childhood malnutrition. Nigeria is ravaged with childhood malnutrition and about 2,000,000 children under the age of 5 years are malnourished and have stunted growth. About 11% of all Nigerian women of reproductive age are malnourished/stunted. This leads to maternal short stature, prematurity of the pelvis and subsequently obstructed labor and VVF.

Education has a protective or positive effect on young women by empowering them with more involvement in decision-making concerning their health, more willingness to look for and

utilized MCHS, delay age at marriage and early pregnancy, economic empowerment and the ability to resist harmful traditional practices like FGM. Unfortunately, majority, about 70% of all VVF patients in Nigeria are illiterate, with many of them rural dwellers where only 36% of women are literate or educated. The picture is gloomier in the northern Nigeria where the highest female literacy rate is in 28.3% in the North east.

Low literacy level has closed association with poverty and unemployment and VVF patients in Nigeria are found in the poorest communities in the country. Nigeria has high poverty (40.1%) and can be attributed to the high level of unemployment rate (23%). Low SES negatively affects health and invariably increases maternal morbidity and mortality. In Nigeria about 55%-89% of VVF patients have low SES, as compared to 70% for women in general. Low SES inhibits women's accessibility to MCHS and VVF care.

Accessibility to health facilities is a strong determinant as well as a barrier of VVF in Nigeria. Many VVF patients in Nigeria delivered at home, in the absence of SBA or presents late to a health facility with obstructed labor. Institutional delivery is low in Nigeria with only 38% been hospital-based and only 43% of all deliveries are in the presence of SBA. Reasons for this could be from delay in seeking care or due to harmful sociocultural problems like gender inequality or subjugation of women. Women from most states in northern Nigeria are expected to be under strict control of their husbands or other male figures in the society. They have no autonomy and are expected to seek permission from the husbands or other family members even to go to a hospital or to solicit money to spend on healthcare. This causes delay in seeking healthcare even when faced with labor complications that can lead to VVF. Geographical inaccessibility and limited transport options could also create an important determinant of VVF in Nigeria.

Perceived uninviting and hostile attitude of HCWs to patients can dampen their zeal in seeking hospital-based care. This is in addition, to the fact that many public health facilities, (as only 4% of public health facilities in Nigeria meet the required standard for EmOC) are either short-staffed, lack medications and equipment, staff lacking adequate knowledge and skills to render Bmoc or EmOC services, or a combination of the above. These all contribute and worsen the burden of VVF in Nigeria.

Several policies and interventions initiated and adopted by many countries to reduce and potentially prevent high burden of VVF have shown some promising results, which could also be adopted in Nigeria. A step in delaying or preventing teenage pregnancy (and early marriage) is by promoting the education of the girl child. As many VVF patients in Nigeria (70%) lack formal education, promoting the education of the girl child. Higher educational attainment equates to low chance is teenage pregnancy and early marriage as it increases the level awareness of their sexual and reproductive health, use of modern contraceptive methods to prevent pregnancy and their overall wellbeing.

The need to strengthen, strictly enforce and monitor laws against child marriage cannot be over-emphasized. Though there is a National law prohibiting the act, it can only be effective in the

country if all states in the country abide by it. As of today, only 23 states out of 36 have adopted the law against marriages. States in northern Nigeria are known for the early marital practices under the disguise of the sharia (Islamic) law, which is inconsistent with what the Child Right Act stands for. This alone could contribute to the persistence of VVF in the country.

Interventions to stop harmful practices like FGM and Yankan gishiri will reduce VVF burden in Nigeria. Though the legislation was enacted in 2015, laxity and lack of monitoring is why the practices continue to exist in Nigeria. Strict legislation will not be enough to tackle the program and there is a chance that it will continue underground. But with monitoring and increasing community awareness and participation of men, traditional and religious leaders to trigger positive societal change, these practices could be eliminated from the communities.

The issue of gender inequality in many rural communities in Nigeria has greatly contributed to the prevalence of VVF, as women are always expected to be under the strict control of men even when it comes to pregnancy and other health-related issues, thereby constituting a delay and a constraint in seeking better MCHS. Promoting gender equality and women empowerment not only alleviate poverty and reduces domestic violence, but also have the potential to lessen and possibly prevent the burden of VVF and other maternal morbidity and mortality in Nigeria by increasing their access and utilization of hospital-based health care services.

Improvement and the provision of timely accessible and affordable health services also has the potential of preventing and reducing the burden of VVF in Nigeria. Provision of alternative means of transportation like motorbike ambulances was shown to significantly improve hospital-based delivery in LMICs. Studies in Malawi shows a significant increase from 25%-49% with associated reduction in maternal mortality and morbidity. Same means of transportation can be also be used as a source of transportation for referral of patients. The creation and presence of MWHs where pregnant women with ‘high risk pregnancy’ live, has been shown by a study in Zambia to increase not just hospital-based deliveries by up to 61%, but also provide timely medical intervention by identifying childbirth complication and timely referral to better equipped health centers.

Raising public or community awareness can also be improved by providing a toll-free telephone line like done in Sierra Leone. This helps in raising awareness by giving a quick access to young girls and women even in remote locations to call and interact with HCWs concerning their health and general wellbeing. It also provides a medium through which VVF patient or women with fistula symptoms can be identified and necessary arrangements can be made to transport to health facility for repair and rehabilitation.

Continuous training and retraining of HCWs in the provision of quality EmOC services is another intervention that improves the quality of care in repair and rehabilitation of VVF patients. This include the use of partographs in monitoring labor and identification of labor complications. In settings where there is shortage of HCWs in health facilities, task-shifting can

be used to increase productive efficiency in service delivery, reduces shortage and imbalance in skill mix and invariably reduces financial barrier to seeking health care.

While conducting this work, as limitations of the study, there could be more information on the subject but are not within the ten (10) year period. Again, this review was limited to articles published in English and could have missed relevant articles published in other languages.

There is also no data on individual states in Nigeria and on some occasions, data from a particular region in the country was used to make generalization. Also, less studies were conducted on vesicovaginal fistula in Southern parts of Nigeria, hence most of the data is from the Northern states of the country. This thesis could not find exact data for individual state analysis.

Limitation of the Dahlgren and Whitehead framework in this thesis is that, it could not link or find association of all its component and VVF. The link and association of VVF and Globalization should have been added in order to unravel how it influence it. There is need for community-based studies to ascertain the exact incidence and prevalence of VVF as well as possible association with the determinants. This will help in making informed decisions in the prevention and possible elimination of VVF in the country.

CHAPTER 5

CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

Vesicovaginal Fistula still remains a huge public health problem in Nigeria. Exact incidence and prevalence of the disease burden in Nigeria is difficult to ascertain as many women with VVF are living in remote, rural areas and lack access to quality and affordable health care or treatment. They also lack awareness about their condition and may be isolated from their communities. Early age at intercourse and early child bearing, low socioeconomic status, gender inequality and lack of access to timely Emergency obstetric services are the main drivers of the problem in Nigeria. Low literacy level and poverty connect these determinants together making it especially difficult for poor women residing in the remote rural areas. Several interventions adopted in other LMICs and SSA to address the determinants of VVF were identified. These interventions when adopted in Nigeria, could potentially reverse the current trend of VVF in the country. These include interventions to delay the age of first pregnancy, stopping of harmful cultural practices including FGM, promotion of gender equality and provision of improved accessible and affordable maternal health care services and Emergency Obstetric care services.

The Nigerian government through the Ministry of Health and other relevant stakeholders should not just aim to improve the access the emergency obstetric care services, fistula repair treatment and increased attendance to skilled birth attendants, but also join forces together to tackle those determinants that serve as drivers to the high burden of the problem in the country.

5.2. Recommendations.

For a clarity, recommended interventions that could potentially reverses or eliminate VVF in Nigeria can be provided at key intervention levels, viz: The Government, Healthcare workers and other stakeholders and the community.

5.2.1 Government level

1. Strengthening and strict monitoring and reinforcing of legislation against harmful cultural practices like FGM and early/child marriage. The Child Right Act should be strengthened and enacted by all states in the country.

2. Poverty-eradication or alleviation schemes that will improve the SES of the people as well as promote economic empowerment for women and young girls

3. Increase accessibility to and provision of BmOC and EmOC services, especially to those situated in the remote, rural areas in the country. This should include strategies that will increase institutional delivery and attendance by SBAs.

4. Promote girl-child education up to post primary level.

5. Removal of financial barriers and provision of affordable maternal health care services.

5.2.2 Healthcare workers and other stakeholders

6**.** Increasing general public awareness on the causes, determinants and other preventive measures to curb VVF in communities.

7. Continuous training and retraining of HCWs providing EmOC and BmOC services including the use of partograph.

8. More community-based studies to determine the exact incidence and prevalence of VVF and to establish clearly how the determinants relates. Thus, providing a better guide in making decisions and recommendations in the prevention and potential elimination of VVF in Nigeria.

5.2.3 For the Community

9. Increased community participation and male involvement in decision-making and steering a positive societal change towards abolishing harmful traditional and cultural practices, like delaying early marriage and pregnancy and FGM that promotes the development of VVF in Nigeria.

10.. Promote girl-child education up to post primary level.

11. Promoting increased use or uptake of family planning and modern contraceptive methods.

REFERENCES.

1. UNFPA Nigeria | NATIONAL STRATEGIC FRAME WORK FOR THE ELIMINATION OF OBSTETRIC FISTULA IN NIGERIA 2019 - 2023 [Internet]. [cited 2020 May 31]. Available from: https://nigeria.unfpa.org/en/publications/national-strategic-frame-work-elimination-obstetric-fistula-nigeria-2019-2023

2. NPC NPC-, ICF. The Federal Republic of Nigeria Nigeria Demographic and Health Survey 2018 National Population Commission Abuja, Nigeria [Internet]. 2019 [cited 2020 Jun 9]. Available from: www.DHSprogram.com.

3. Ministry F, Health OF. NATIONAL STRATEGIC FRAMEWORK FOR THE ELIMINATION OF OBSTETRIC FISTULA IN Nigeria. خاک و آب. 2015.

4. ttps://www.worldometers.info/world-population/nigeria-population/. Nigeria Population (2020) - Worldometer [Internet]. Worldometer. 2020 [cited 2020 Jun 12]. Available from: https://www.worldometers.info/world-population/nigeria-population/

5. Nigeria Population 2020 (Demographics, Maps, Graphs) [Internet]. [cited 2020 Jun 14]. Available from: https://worldpopulationreview.com/countries/nigeria-population/

6. Central Intelligence Agency (CIA). Africa :: Nigeria — The World Factbook - Central Intelligence Agency [Internet]. Central Intelligence Agency (CIA). 2019 [cited 2020 Jun 12]. Available from: https://www.cia.gov/library/publications/the-world-factbook/geos/ni.html

7. Central Intelligence Office. Field Listing :: Religions — The World Factbook - Central Intelligence Agency [Internet]. CIA World Factbook. 2020 [cited 2020 Jun 13]. Available from: https://www.cia.gov/library/publications/the-world-factbook/fields/401.html#AF

8. Diamant J. Which countries have the 10 largest Christian and Muslim populations? | Pew Research Center [Internet]. pewresearch April 19. 2019 [cited 2020 Jun 13]. Available from: https://www.pewresearch.org/fact-tank/2019/04/01/the-countries-with-the-10-largest-christian-populations-and-the-10-largest-muslim-populations/

9. Nigeria GDP | 1960-2019 Data | 2020-2022 Forecast | Historical | Chart | News [Internet]. [cited 2020 Jun 13]. Available from: https://tradingeconomics.com/nigeria/gdp

10. SMALL FAMILY FARMS COUNTRY FACTSHEET THE CONTEXT OF AGRICULTURE AND THE ROLE OF SMALL FAMILY FARMS Economic situation and diversification [Internet]. [cited 2020 Jun 13]. Available from: www.fao.org/family-farming/themes/small-family-farmers

11. • Nigeria: poverty rate, by state 2019 | Statista [Internet]. [cited 2020 Aug 4]. Available from: https://www.statista.com/statistics/1121438/poverty-headcount-rate-in-nigeria-by-state/

12. • Nigeria: Gini coefficient, by area 2019 | Statista [Internet]. [cited 2020 Aug 4]. Available from: https://www.statista.com/statistics/1121404/gini-coefficient-in-nigeria/

13. Development H. Inequalities in Human Development in the 21 st Century Nigeria [Internet]. 2019 [cited 2020 Jun 13]. Available from: http://hdr.undp.org/en/data

14. Clark N, Ausukuya C. Education in Nigeria - WENR [Internet]. World Education News and Reviews. 2013 [cited 2020 Jun 14]. Available from: http://wenr.wes.org/2013/07/an-overview-of-education-in-nigeria/

15. How much did Boko Haram forbid education in Nigeria? [Internet]. [cited 2020 Jun 23]. Available from: https://blogs.worldbank.org/africacan/how-much-did-boko-haram-forbid-education-nigeria

16. Eseibo. Education _ UNICEF Nigeria [Internet]. 2013 [cited 2020 Jun 14]. Available from: https://www.unicef.org/nigeria/education

17. WHO | Nigeria. WHO. 2020;

18. Welcome MO. The Nigerian health care system: Need for integrating adequate medical intelligence and surveillance systems. In: Journal of Pharmacy and Bioallied Sciences [Internet]. Wolters Kluwer -- Medknow Publications; 2011 [cited 2020 Jun 24]. p. 470–8. Available from: /pmc/articles/PMC3249694/?report=abstract

19. Abimbola S, Olanipekun T, Igbokwe U, Negin J, Jan S, Martiniuk A, et al. How decentralisation influences the retention of primary health care workers in rural Nigeria. Glob Health Action [Internet]. 2015 [cited 2020 Aug 4];8(1). Available from: /pmc/articles/PMC4349907/?report=abstract

20. Koce F, Randhawa G, Ochieng B. Understanding healthcare self-referral in Nigeria from the service users' perspective: A qualitative study of Niger state [Internet]. Vol. 19, BMC Health Services Research. BioMed Central Ltd.; 2019 [cited 2020 Aug 4]. p. 209. Available from: https://bmchealthservres.biomedcentral.com/articles/10.1186/s12913-019-4046-9

21. Onwujekwe O, Ezumah N, Mbachu C, Obi F, Ichoku H, Uzochukwu B, et al. Exploring effectiveness of different health financing mechanisms in Nigeria; what needs to change and how can it happen? BMC Health Serv Res [Internet]. 2019 Sep 13 [cited 2020 Aug 4];19(1):661. Available from: https://bmchealthservres.biomedcentral.com/articles/10.1186/s12913-019-4512-4

22. HEALTH FINANCING PROFILE: NIGERIA Key country indicators Development indicators* **WHO Global Health Expenditure Database, 2013 Contextual Factors [Internet]. 2013 [cited 2020 Aug 11]. Available from: www.africanstrategies4health.org

23. Ministry of Health F. Promoting the Health of Nigerians to Accelerate Socio-economic

Development. 2016.

24. Canci H, Odukoya OA. Ethnic and religious crises in Nigeria [Internet]. Vol. 16, African Journal on Conflict Resolution. 2016 [cited 2020 Jun 15]. p. 87–111. Available from: https://www.accord.org.za/ajcr-issues/ethnic-religious-crises-nigeria/

25. United Nations Population Fund (UNFPA,). Obstetric fistula | UNFPA - United Nations Population Fund [Internet]. Vol. 14, United Nations Population Fund (UNFPA). 2018 [cited 2020 May 14]. p. 1–9. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3905156/pdf/1471-2393-14-44.pdf%0Ahttps://www.unfpa.org/obstetric-fistula

26. Stamatakos M, Sargedi C, Stasinou T, Kontzoglou K. Vesicovaginal Fistula: Diagnosis and Management. Vol. 76, Indian Journal of Surgery. Springer India; 2014. p. 131–6.

27. Ijaiya M, Rahman A, Aboyeji A, Olatinwo A, Esuga S, Ogah O, et al. Vesicovaginal Fistula: A Review of Nigerian Experience. West Afr J Med. 2011 Jul 22;29(5).

28. Ampofo EK, Omotara BA, Otu T, Uchebo G. Risk factors of vesico-vaginal fistulae in Maiduguri, Nigeria: A case-control study. Trop Doct. 1990;20(3):138–9.

29. Tunçalp Ö, Tripathi V, Landry E, Stanton CK, Ahmed S. Measuring the incidence and prevalence of obstetric fistula: Approaches, needs and recommendations. Bull World Health Organ. 2015;93(1):60–2.

30. El-Azab AS, Abolella HA, Farouk M. Update on vesicovaginal fistula: A systematic review. Vol. 17, Arab Journal of Urology. Taylor and Francis Ltd.; 2019. p. 61–8.

31. Rajaian S, Pragatheeswarane M, Panda A. Vesicovaginal fistula: Review and recent trends. Indian J Urol. 2019;35(4):250.

32. Mikah S, Daru P, Karshima J, Nyango D. The burden of vesico-vaginal fistula in north central Nigeria. J West African Coll Surg [Internet]. 2011 Apr [cited 2020 Jan 27];1(2):50–62. Available from: http://www.ncbi.nlm.nih.gov/pubmed/25452953

33. Hassan M, Awosan KJ. Genitourinary fistulas experience in a tertiary hospital in North-Western Nigeria. Asian J Med Sci. 2018 Oct 29;9(6):31–6.

34. Amodu OC, Salami BO, Richter MS. Obstetric fistula policy in Nigeria: A critical discourse analysis. BMC Pregnancy Childbirth [Internet]. 2018 Jun 27 [cited 2020 May 16];18(1):269. Available from: https://bmcpregnancychildbirth.biomedcentral.com/articles/10.1186/s12884-018-1907-x

35. Raji MO, Hassan M, Yusuf MH, Yusuf R, Ahmad A, Raji HO. Knowledge, Effect of Vesico Vaginal Fistula (VVF) and Satisfaction with VVF Repair Related Services in a Fistula Repair Facility in North Western Nigeria. 2018 [cited 2020 Jan 29]; Available

from: www.ijcmr.com

36. Adedokun ST, Uthman OA. Women who have not utilized health Service for Delivery in Nigeria: Who are they and where do they live? BMC Pregnancy Childbirth [Internet]. 2019 Mar 13 [cited 2020 May 29];19(1):93. Available from: https://bmcpregnancychildbirth.biomedcentral.com/articles/10.1186/s12884-019-2242-6

37. Tebeu PM, Fomulu JN, Khaddaj S, De Bernis L, Delvaux T, Rochat CH. Risk factors for obstetric fistula: A clinical review. Vol. 23, International Urogynecology Journal. Springer London; 2012. p. 387–94.

38. Bentina Alawari M, Maureen N. FACTORS AFFECTING THE UTILIAZATION OF THE VESICO VAGINAL FISTULA (VVF) CENTER IN EBOYI STATE, NIGERIA. Vol. 1, THE NIGERIAN JOURNAL OF MEDICAL SOCIOLOGY. 2020 Feb.

39. Ouedraogo I, McConley R, Payne C, Heller A, Wall LL. Gurya cutting and female genital fistulas in Niger: ten cases. Int Urogynecol J. 2018 Mar 1;29(3):363–8.

40. Mikah S, Daru P, Karshima J, Nyango D. The burden of vesico-vaginal fistula in north central Nigeria. J West African Coll Surg [Internet]. 2011 Apr [cited 2020 Feb 4];1(2):50–62. Available from: http://www.ncbi.nlm.nih.gov/pubmed/25452953

41. Ugochukwu O. Vesico-Vaginal Fistula in Developing Countries - Time to Turn off The Tap. J Pregnancy Child Heal. 2015 Jul 7;02(04):1–3.

42. United Nations Population Fund (UNFPA,). Obstetric fistula | UNFPA - United Nations Population Fund [Internet]. Vol. 14, United Nations Population Fund (UNFPA). 2018 [cited 2020 May 31]. p. 1–9. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3905156/pdf/1471-2393-14-44.pdf%0Ahttps://www.unfpa.org/obstetric-fistula

43. Iatrogenic Fistula – Fistula Care Plus [Internet]. [cited 2020 May 31]. Available from: https://fistulacare.org/what-is-fistula/iatrogenic-fistula/

44. Amodu OC, Salami BO, Richter MS. Obstetric fistula policy in Nigeria: A critical discourse analysis. BMC Pregnancy Childbirth [Internet]. 2018 Jun 27 [cited 2020 May 17];18(1):269. Available from: https://bmcpregnancychildbirth.biomedcentral.com/articles/10.1186/s12884-018-1907-x

45. Economic and Social Research Council. The Dahlgren-Whitehead rainbow - Economic and Social Research Council [Internet]. Website. 2019 [cited 2020 May 17]. Available from: https://esrc.ukri.org/about-us/50-years-of-esrc/50-achievements/the-dahlgren-whitehead-rainbow/

46. Cowgill KD, Bishop J, Norgaard AK, Rubens CE, Gravett MG. Obstetric fistula in low-resource countries: An under-valued and under-studied problem - systematic review of its

incidence, prevalence, and association with stillbirth. BMC Pregnancy Childbirth. 2015 Aug 26;15(1).

47. L. L. WALL S.D. ARROWSMITH, N. D. BRIGGS AL, ÇIn. Urinary Incontinence in the Developing World : The Obstetric Fistula. Committee 12. 2014.

48. Bashah DT, Worku AG, Mengistu MY. Consequences of obstetric fistula in sub Sahara African countries, from patients' perspective: A systematic review of qualitative studies. BMC Womens Health [Internet]. 2018 Jun 20 [cited 2020 Aug 9];18(1):106. Available from: https://bmcwomenshealth.biomedcentral.com/articles/10.1186/s12905-018-0605-1

49. Kirschner C V., Yost KJ, Du H, Karshima JA, Arrowsmith SD, Wall LL. Obstetric fistula: The ECWA Evangel VVF Center surgical experience from Jos, Nigeria. Int Urogynecol J. 2010 Aug 11;21(12):1525–33.

50. Hassan M, Nasir S. Co morbidities associated with vesico vaginal fistula in patients managed in Maryam Abacha Fistula Hospital Sokoto, Northwestern Nigeria. Trop J Obstet Gynaecol. 2019;36(1):44.

51. Tennfjord MK, Muleta M, Kiserud T. Musculoskeletal sequelae in patients with obstetric fistula – a case–control study. BMC Womens Health [Internet]. 2014 Dec 8 [cited 2020 Jun 16];14(1):136. Available from: https://bmcwomenshealth.biomedcentral.com/articles/10.1186/s12905-014-0136-3

52. Wilson SM, Sikkema KJ, Watt MH, Masenga GG. Psychological Symptoms Among Obstetric Fistula Patients Compared to Gynecology Outpatients in Tanzania. Int J Behav Med. 2015 Oct 28;22(5):605–13.

53. Okoye UO, Nkechi E-E, Tanyi PL. Living with vesico-vaginal fistula: experiences of women awaiting repairs in Ebonyi State, Nigeria. Tanzan J Health Res. 2014;16(4).

54. David Nsemo A. Influence of Abandonment, Stigmatization and Social Isolation on the Coping Strategies of Women with Vesico Vaginal Fistula in Akwa Ibom State, Nigeria. 2014;

55. Fehintola A, Fehintola F, Adetoye A, Ayegbusi E, Alaba O, Ajiboye A, et al. Birth and sorrow: The medico-social consequences of obstetric fistula in Ilesha, Nigeria. Trop J Obstet Gynaecol [Internet]. 2019 [cited 2020 Aug 9];36(3):442. Available from: http://www.tjogonline.com/article.asp?issn=0189-5117;year=2019;volume=36;issue=3;spage=442;epage=447;aulast=Fehintola

56. Obstetric Fistulae: Cause and [Internet]. [cited 2020 Jun 16]. Available from: https://www.glowm.com/resources/glowm/pdf/POFS/POFS_Chap_01.pdf

57. Aboh JU, Nwankwo BE, Obi TC, Agu SA. Clinical Features Of Patients Diagnosed With Vesico Vaginal Fistula (Vvf) In South East Nigeria [Internet]. Vol. 11, Nature and

Science. 2013 [cited 2020 Jun 17]. Available from: http://www.sciencepub.net/nature

58. Tagurum YO, Banwat ME, Igoh C, Mayowa Okonoda K, Oyebode T, Chirdan OO. Primary Screening for Post-Traumatic Stress Disorder (PTSD) Symptoms among Patients with Obstetric Fistula in Zamko, Plateau State. Int J Heal Sci Res [Internet]. 2018 [cited 2020 Jun 18];8(8):1. Available from: www.ijhsr.org

59. Bashah DT, Worku AG, Yitayal M, Azale T. The loss of dignity: Social experience and coping of women with obstetric fistula, in Northwest Ethiopia. BMC Womens Health [Internet]. 2019 Jul 1 [cited 2020 Jun 18];19(1):84. Available from: https://bmcwomenshealth.biomedcentral.com/articles/10.1186/s12905-019-0781-7

60. Bello OO, Morhason-Bello IO, Ojengbede OA. Nigeria, a high burden state of obstetric fistula: A contextual analysis of key drivers. Vol. 36, Pan African Medical Journal. African Field Epidemiology Network; 2020. p. 1–12.

61. NPC, ICF. The Federal Republic of Nigeria Nigeria Demographic and Health Survey 2018 National Population Commission Abuja, Nigeria [Internet]. 2019 [cited 2020 Aug 5]. Available from: www.DHSprogram.com.

62. Maheu-Giroux M, Filippi V, Maulet N, Samadoulougou S, Castro MC, Meda N, et al. Risk factors for vaginal fistula symptoms in Sub-Saharan Africa: A pooled analysis of national household survey data. BMC Pregnancy Childbirth [Internet]. 2016 Apr 21 [cited 2020 Jun 23];16(1):82. Available from: http://bmcpregnancychildbirth.biomedcentral.com/articles/10.1186/s12884-016-0871-6

63. Den Hollander GC, Janszen EWM. Obstetric fistulas in Uganda: Scoping review using a determinant of health approach to provide a framework for health policy improvement. BMC Pregnancy Childbirth [Internet]. 2020 Apr 29 [cited 2020 Jul 14];20(1):257. Available from: https://bmcpregnancychildbirth.biomedcentral.com/articles/10.1186/s12884-020-02951-7

64. Kyari GV, Ayodele J. The socio-economic effect of early marriage in north western Nigeria. Mediterr J Soc Sci. 2014;5(14):582–92.

65. Andargie AA, Debu A. Determinants of obstetric fistula in Ethiopia. Afr Health Sci [Internet]. 2017 [cited 2020 Jun 20];17(3):671–80. Available from: /pmc/articles/PMC5656212/?report=abstract

66. Tebeu PM, Fomulu JN, Khaddaj S, De Bernis L, Delvaux T, Rochat CH. Risk factors for obstetric fistula: A clinical review [Internet]. Vol. 23, International Urogynecology Journal. Springer London; 2012 [cited 2020 Jun 20]. p. 387–94. Available from: /pmc/articles/PMC3305871/?report=abstract

67. Harrison MS, Mabeya H, Goldenberg RL, McClure EM. Urogenital fistula reviewed: a

marker of severe maternal morbidity and an indicator of the quality of maternal healthcare delivery. Matern Heal Neonatol Perinatol [Internet]. 2015 Dec 19 [cited 2020 Jun 20];1(1):1–8. Available from: https://link.springer.com/articles/10.1186/s40748-015-0020-7

68. Odu K. THE PREDISPOSING FACTORS AFFECTING THE PREVALENCE OF VESICO-VAGINAL FISTULA AMONG WOMEN OF REPRODUCTIVE AGE IN NORTHERN NIGERIA [Internet]. Vol. 1, European Journal of Advanced Research in Biological and Life Sciences. Progressive Academic Publishing; 2013 [cited 2020 Jun 20]. Available from: www.idpublications.org

69. Metcalfe L. All countries compared for Health; Human height; Average female height [Internet]. NationMaster.com 2003-2018. 2018 [cited 2020 Aug 10]. Available from: http://www.nationmaster.com/country-info/stats/Health/Human-height/Average-female-height

70. UNICEF. Nutrition | UNICEF Nigeria [Internet]. Unicef. 2019 [cited 2020 Jun 22]. Available from: https://www.unicef.org/nigeria/nutrition%0Ahttps://www.unicef.org/nigeria/education%0Ahttps://www.unicef.org/nigeria/nutrition

71. Wells JCK. The New "Obstetrical Dilemma": Stunting, Obesity and the Risk of Obstructed Labour. Anat Rec [Internet]. 2017 Apr 1 [cited 2020 Jun 22];300(4):716–31. Available from: http://doi.wiley.com/10.1002/ar.23540

72. (PDF) MODERN CONTRACEPTIVES UTILIZATION AND BARRIERS AMONG WOMEN WITH OBSTETRIC FISTULA IN NORTH WESTERN NIGERIA [Internet]. [cited 2020 Jun 20]. Available from: https://www.researchgate.net/publication/323264842_MODERN_CONTRACEPTIVES_UTILIZATION_AND_BARRIERS_AMONG_WOMEN_WITH_OBSTETRIC_FISTULA_IN_NORTH_WESTERN_NIGERIA

73. Wall LL. Overcoming phase 1 delays: The critical component of obstetric fistula prevention programs in resource-poor countries [Internet]. Vol. 12, BMC Pregnancy and Childbirth. BioMed Central; 2012 [cited 2020 Jun 20]. p. 1–13. Available from: https://bmcpregnancychildbirth.biomedcentral.com/articles/10.1186/1471-2393-12-68

74. Umar AS. Does female education explain the disparity in the use of antenatal and natal services in Nigeria? Evidence from demographic and health survey data. Afr Health Sci [Internet]. 2017 [cited 2020 Jun 23];17(2):391–9. Available from: /pmc/articles/PMC5637024/?report=abstract

75. Proshare Intelligent Investing. The Value of Girl-Child Education in Nigeria [Internet]. 2018 [cited 2020 Aug 10]. Available from: https://www.proshareng.com/news/Education-

Knowledge/The-Value-of-Girl-Child-Education-in-Nig/41338

76. Baker Z, Bellows B, Bach R, Warren C. Barriers to obstetric fistula treatment in low-income countries: a systematic review. Trop Med Int Heal [Internet]. 2017 Aug 1 [cited 2020 Jun 7];22(8):938–59. Available from: http://doi.wiley.com/10.1111/tmi.12893

77. United Nations Population Fund. When Childbirth Harms: Obstetric Fistula [Internet]. United Nations Population Fund. 2012 [cited 2020 Jun 23]. Available from: http://www.unfpa.org/sites/default/files/resource-pdf/EN-SRH fact sheet-Fistula.pdf

78. WHO | End fistula. Restore Women's Dignity. Who. 2015;

79. Tanzania National Bureau of Statistics. National Bureau of Statistics [Internet]. Vol. X, Population (English Edition). 2006 [cited 2020 Jun 23]. Available from: https://nigerianstat.gov.ng/

80. Mohammad UF, David J. The Relationship between Poverty and Unemployment in Niger State. Signifikan J Ilmu Ekon. 2019 Mar 10;8(1):71–8.

81. Keya KT, Sripad P, Nwala E, Warren CE. "Poverty is the big thing": Exploring financial, transportation, and opportunity costs associated with fistula management and repair in Nigeria and Uganda. Int J Equity Health [Internet]. 2018 [cited 2020 Jun 23];17(1). Available from: https://doi.org/10.1186/s12939-018-0777-1

82. Delamou A, Utz B, Delvaux T, Beavogui AH, Shahabuddin A, Koivogui A, et al. Pregnancy and childbirth after repair of obstetric fistula in sub-Saharan Africa: *Scoping Review*. Trop Med Int Heal [Internet]. 2016 Nov 1 [cited 2020 Aug 9];21(11):1348–65. Available from: http://doi.wiley.com/10.1111/tmi.12771

83. Fast Facts About Fistula From GlobalGiving | Learn More [Internet]. [cited 2020 Jun 24]. Available from: https://www.globalgiving.org/learn/fast-facts-about-fistula/

84. Awosusi A, Folaranmi T, Yates R. Nigeria's new government and public financing for universal health coverage [Internet]. Vol. 3, The Lancet Global Health. Elsevier Ltd; 2015 [cited 2020 Jun 24]. p. e514–5. Available from: http://www.thelancet.com/article/S2214109X15000881/fulltext

85. U S, E A. Integration of traditional birth attendants (TBAs) into the health sector for improving maternal health in Nigeria: a systematic review. Sub-Saharan African J Med [Internet]. 2019 [cited 2020 Aug 12];6(2):55. Available from: http://www.ssajm.org

86. Prata N, Ejembi C, Fraser A, Shittu O, Minkler M. Community mobilization to reduce postpartum hemorrhage in home births in northern Nigeria. Soc Sci Med. 2012 Apr;74(8):1288–96.

87. Jonas K, Crutzen R, van den Borne B, Reddy P. Healthcare workers' behaviors and

personal determinants associated with providing adequate sexual and reproductive healthcare services in sub-Saharan Africa: A systematic review. BMC Pregnancy Childbirth. 2017 Mar 13;17(1):1–19.

88. Adeyanju O, Tubeuf S, Ensor T. Socio-economic inequalities in access to maternal and child healthcare in Nigeria: Changes over time and decomposition analysis. Health Policy Plan [Internet]. 2017 [cited 2020 Jun 26];32(8):1111–9. Available from: https://academic.oup.com/heapol/article-abstract/32/8/1111/3829669

89. UNICEF. Child marriage | UNICEF South Asia [Internet]. unicef south Asia. 2019 [cited 2020 Aug 10]. Available from: https://www.unicef.org/rosa/what-we-do/child-protection/child-marriage

90. Brides G not. Nigeria - Child Marriage Around The World. Girls Not Brides [Internet]. 2017 [cited 2020 Aug 5]. Available from: https://www.girlsnotbrides.org/child-marriage/nigeria/

91. Putting an end to early and forced marriage | Islamic Relief Worldwide [Internet]. [cited 2020 Jun 27]. Available from: https://www.islamic-relief.org/putting-an-end-to-early-and-forced-marriage-2/

92. World Health Organization. Female Genital Mutilation | WHO | Regional Office for Africa [Internet]. Who. 2018 [cited 2020 Jun 28]. Available from: https://www.afro.who.int/health-topics/female-genital-mutilation

93. Anzaku AA, Angbalaga AG, Achetu AC, Pedro A, Daniel O, James OC. Implication of female genital mutilation in Nigeria as portal for infectious diseases . J Bacteriol Infect Dis [Internet]. 2018 [cited 2020 Jun 28];2(1):28–30. Available from: https://www.alliedacademies.org/articles/implication-of-female-genital-mutilation-in-nigeria-as-portal-for-infectious-diseases-10194.html

94. Female Genital Mutilation/Cutting: a statistical overview and exploration of the dynamics of change. Vol. 21, Reproductive Health Matters. 2013.

95. Okeke T, Anyaehie U, Ezenyeaku C. An overview of female genital mutilation in Nigeria. Ann Med Health Sci Res [Internet]. 2012 [cited 2020 Jun 28];2(1):70. Available from: /pmc/articles/PMC3507121/?report=abstract

96. Gamal Serour, Ahmed El-Hameed Ragab, Ahmad Omar Hashim, Abdullah Al Husaini AG. Female Circumcision- between the incorrect use of science and the misunderstood doctrine- executive summary. Unicef. 2013.

97. Policy C, Team I. Country Policy and Information Note Nigeria: Female Genital Mutilation (FGM). 2019.

98. Obstetric fistula [Internet]. [cited 2020 Jul 16]. Available from:

https://www.who.int/news-room/facts-in-pictures/detail/10-facts-on-obstetric-fistula

99. Campbell B, Gilmore K, Kaidbey M, Laski L, Loaiza E, Martinelli-Heckadon S, et al. Motherhood in Childhood The State of World Population 2013 The editorial team is grateful for additional insights, contribu-tions and feedback from UNFPA colleagues, including. 2013.

100. Banke-Thomas AO, Wilton-Waddell OE, Kouraogo SF, Mueller JE. Obstetric Fistula in Sub-Saharan Africa African Journal of Reproductive Health. Vol. 18, Afr J Reprod Health. 2014.

101. UNFPA. Girlhood, not motherhood: Preventing adolescent pregnancy [Internet]. United Nations Population Fund. 2015 [cited 2020 Jul 17]. 1–60 p. Available from: https://www.unfpa.org/sites/default/files/pub-pdf/Girlhood_not_motherhood_final_web.pdf

102. Country Policy and Information Note Nigeria: Female Genital Mutilation (FGM). 2019.

103. Muthumbi J, Svanemyr J, Scolaro E, Temmerman M, Say L. Female genital mutilation: A literature review of the current status of legislation and policies in 27 African countries and Yemen [Internet]. Vol. 19, African Journal of Reproductive Health. 2015 [cited 2020 Jul 20]. p. 32–40. Available from: https://www.ajol.info/index.php/ajrh/article/view/124907

104. LEGISLATIVE REFORM TO SUPPORT THE ABANDONMENT OF FEMALE GENITAL MUTILATION/CUTTING Minister Mushira Khattab of the Egyptian Ministry of State for Family and Population and a number of other Egyptian colleagues for providing valuable information on the leg. 2010.

105. Obianwu O, Adetunji A, Dirisu O. Understanding medicalisation of female genital mutilation/cutting (FGM/C): A qualitative study of parents and health workers in Nigeria [Internet]. 2018 [cited 2020 Jul 20]. Available from: www.popcouncil.org

106. Singh K, Bloom S, Haney E, Olorunsaiye C, Brodish P. Gender equality and childbirth in a health facility: Nigeria and MDG5. Afr J Reprod Health [Internet]. 2012 [cited 2020 Jul 20];16(3):123–9. Available from: /pmc/articles/PMC3966063/?report=abstract

107. Singh K, Bloom S, Brodish P. Gender Equality as a Means to Improve Maternal and Child Health in Africa. Health Care Women Int [Internet]. 2015 Jan 2 [cited 2020 Jul 20];36(1):57–69. Available from: /pmc/articles/PMC4333143/?report=abstract

108. Roka ZG, Akech M, Wanzala P, Omolo J, Gitta S, Waiswa P. Factors associated with obstetric fistulae occurrence among patients attending selected hospitals in Kenya, 2010: a case control study. BMC Pregnancy Childbirth [Internet]. 2013 Dec 28 [cited 2020 Jul 22];13(1):56. Available from:

https://bmcpregnancychildbirth.biomedcentral.com/articles/10.1186/1471-2393-13-56

109. United Nations General Assembly. Supporting efforts to end obstetric fistula.Report of the Secretary-General [Internet]. 2014 [cited 2020 Jul 22]. Available from: http://www.zonta.org/Portals/0/PDFs/New PDFs/69th UNGA - SG Report on Obstetric Fistula - A-69-256.pdf

110. WHO | Maternity waiting homes: a review of experiences. Who [Internet]. 2014 [cited 2020 Jul 22]; Available from: https://www.who.int/reproductivehealth/publications/maternal_perinatal_health/MSM_96_21/en/#.XsK1NvQd2_o.mendeley

111. Lori JR, Perosky J, Munro-Kramer ML, Veliz P, Musonda G, Kaunda J, et al. Maternity waiting homes as part of a comprehensive approach to maternal and newborn care: A cross-sectional survey [Internet]. Vol. 19, BMC Pregnancy and Childbirth. BioMed Central Ltd.; 2019 [cited 2020 Jul 22]. p. 228. Available from: https://bmcpregnancychildbirth.biomedcentral.com/articles/10.1186/s12884-019-2384-6

112. Henry EG, Semrau K, Hamer DH, Vian T, Nambao M, Mataka K, et al. The influence of quality maternity waiting homes on utilization of facilities for delivery in rural Zambia. Reprod Health [Internet]. 2017 May 30 [cited 2020 Jul 22];14(1):1–10. Available from: https://link.springer.com/articles/10.1186/s12978-017-0328-z

113. Fulton BD, Scheffler RM, Sparkes SP, Auh EY, Vujicic M, Soucat A. Health workforce skill mix and task shifting in low income countries: A review of recent evidence [Internet]. Vol. 9, Human Resources for Health. BioMed Central; 2011 [cited 2020 Jul 23]. p. 1. Available from: https://human-resources-health.biomedcentral.com/articles/10.1186/1478-4491-9-1