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Factors Affecting Maternal Mortality Rates in Nigeria: A Review of Challenges and Potential Solutions

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Abstract

Maternal mortality is a significant public health issue in Nigeria, accounting for approximately 23% of global maternal deaths. This review explored the main factors affecting maternal mortality rates in Nigeria and proposed potential solutions. Accurate data collection on maternal health in Nigeria, especially in rural areas, remains challenging.

Aims: this paper aimed to identify the key factors contributing to maternal mortality in Nigeria and proposed solutions to address this issue.

Study design: A qualitative analysis of literature review narration was employed taking into account the research methodology, instrument interpretation, and data analysis in order to avoid bias and misinterpretation of result findings.

Methodology: The methodology was designed to systematically gather, analyse, and synthesise data from multiple sources, including the peer-reviewed academic literature, government reports, and NGO publications. To ensure rigor and reproducibility, in the literature search were utilised several databases and search engines beyond Google, including PubMed, Scopus, Web of Science, Google Scholar, Semantic Scholar, and Research Gate. 50 published papers and articles from credible sources were reviewed in the study, identifying the key issues such as inadequate healthcare infrastructure, socio-economic challenges, cultural and behavioural practices, as well as political factors.

Results: The findings revealed that the major causes of maternal mortality in Nigeria included haemorrhage, infection, unsafe abortion, hypertensive diseases of pregnancy, and obstructed labour. There were cases of socio-economic factors such as unavailability of electricity, transportation delay, the lack of skilled medical personal and cultural factors such as traditional beliefs. Despite various interventions, progress in reducing maternal mortality has been limited.

Conclusion: This paper emphasised the need for continuous investment in maternal and child health, improvements in healthcare infrastructure, education, and effective policy implementation. A holistic approach that integrates organisational structures, technical expertise, human experiences, and patient needs is essential for effectively reducing maternal mortality rates.

Keywords: maternal fatality, pregnant women, antenatal care, healthcare system, childbirth, women's health, motherhood.

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Introduction

Maternal mortality, the death of a woman during pregnancy, childbirth, or within 42 post-pregnancy days, is a significant global health issue, with around 830 women dying daily from related complications. In 2015, 303,000 women died worldwide due to pregnancy-related causes [1, 2]. Nigeria faces particularly high rates, with 560 maternal deaths per 100,000 live births in 2013, contributing to 14% of global maternal deaths [3]. This rate increased to 917 deaths per 100,000 live births by 2015, comprising 23% of global maternal mortality. Sub-Saharan Africa accounts for 62% of global maternal deaths [1, 3]. Maternal mortality profoundly affects children's survival and well-being, leading to an estimated global economic loss of approximately $15 billion [4, 5]. Most deaths are preventable with access to quality healthcare [6]. Despite the efforts, Nigeria's maternal mortality has worsened, failing to meet MDG 5 targets [7-14]. Accurate data collection concerning the maternal health in Nigeria, especially in rural areas, remains challenging due to the lack of records, insecurities and possibly lack of basic medical infrastructure in such areas. However, this paper aimed to identify the key factors contributing to maternal mortality in Nigeria and proposed solutions to address this issue.

Research Problem

The primary research problem addressed in this review was the high maternal mortality rate in Nigeria, which remains a significant public health issue. Despite various interventions, the maternal mortality rate remains alarmingly high. The factors contributing to this issue include a combination of medical, socio-economic, cultural, behavioural, and political factors.

Research Focus

This study focused on identifying and analysing the key factors affecting maternal mortality in Nigeria. It also aimed to evaluate the effectiveness of current interventions as well as to propose strategies to reduce maternal mortality rates. The research placed particular emphasis on the understanding of the socio-economic and cultural barriers that prevent women from accessing adequate maternal healthcare.

Purpose of Study

The purpose of this study was to provide a comprehensive review of the factors contributing to the high maternal mortality rate in Nigeria and to identify potential solutions that could be implemented to effectively address this issue. This involved an in-depth analysis of existing literature and data in order to understand the underlying causes and to propose evidence-based recommendations for reducing maternal mortality.

Research Questions

1. What are the key factors contributing to the high maternal mortality rate in Nigeria?

2. How do the healthcare system, socio-economic, cultural, and political factors influence maternal health outcomes in Nigeria?

3. What are the current interventions and strategies being implemented to reduce maternal mortality in Nigeria?

4. How effective are these interventions and what improvements can be made?

5. What are the research gaps in the existing literature concerning maternal mortality in Nigeria, and what areas require further investigation?

Research Methodology

General Background

Maternal mortality remains a critical public health issue globally, particularly in Nigeria, where the mortality rates are among the highest worldwide. Various factors contribute to this phenomenon, including socio-economic disparities, healthcare access challenges, and cultural influences. The understanding of these factors is essential for developing effective interventions to reduce maternal mortality rates.

Instrument and Procedures

A qualitative research approach was employed in the study, focusing on a comprehensive literature review to investigate the factors influencing maternal mortality in Nigeria. The methodology was designed to systematically gather, analyse, and synthesise data from multiple sources, including the peer-reviewed academic literature, government reports, and NGO publications. To ensure rigor and reproducibility, the literature search utilised several databases and search engines beyond Google, including PubMed, Scopus, Web of Science, Google Scholar, Semantic Scholar, and Research Gate. The search was conducted from May 25th to June 15th, 2023, using the key search terms such as "Maternal mortality in Nigeria," "Factors affecting maternal mortality rates in Nigeria," and others specified for relevance. The articles were selected based on predefined criteria, including the peer-reviewed

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status, relevance to maternal mortality factors in Nigeria, and publication within the last 10 years to ensure currency. Only studies available in English were considered to maintain consistency and accessibility. Each selected article underwent a rigorous review process to assess credibility. This included evaluating the study design, methodology, sample size, and findings' relevance to the research questions. The double-blind review by multiple researchers minimised biases and ensured objectivity.

Data Analysis

The qualitative data analysis utilised the thematic analysis in order to synthesise and interpret the findings from the selected literature, guided by the research questions. This approach enabled the identification of recurring themes and patterns related to factors influencing maternal mortality in Nigeria. A critical self-assessment concerning the methodology revealed potential biases, such as publication bias, where studies with significant findings were more likely to be published. Additionally, the exclusion of non-English publications limited the diversity of perspectives on maternal mortality. However, this exclusion was intentional, given that Nigeria is an official English-speaking country, to ensure consistency and relevance of the sources. To mitigate biases, rigorous criteria were applied during the article selection. It involved multiple researchers in the independent review of each article. This process ensured that the analysis remained focused on the research questions and the specific context of Nigeria. The thematic analysis approach facilitated a structured and thorough examination of the data, thereby minimising the subjective interpretations.

Research Results

Nigeria is the most populous country in Africa, with approximately 214 million people, making it globally the 6th most populated nation. By 2050, its population is projected to reach about 392 million, which will make it the 4th most populated country in the world [15]. However, maternal mortality remains a significant issue, with the number of deaths among pregnant women increasing over the years. According to Mojekwu & Ibekwe [16], maternal mortality continues to be a leading cause of death among women of reproductive age in many countries and remains a serious public health issue, especially in developing countries. Shah & Say [13] define maternal death as the death of a woman while pregnant or within 42 days of the termination of pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes. Nigeria ranks among the top five countries in Africa for maternal mortality, which is a significant concern. Numerous publications have documented the trends in maternal mortality across various states and regions, but there has been less focus on potential solutions to this pressing issue. According to the Nigeria Demographic and Health Survey (NDHS) [17], the under-five mortality rate is 132 deaths per 1,000 live births, while the infant mortality rate is 67 deaths per 1,000 live births. The maternal mortality ratio stands at 512 deaths per 100,000 live births. This means that for every 1,000 live births in Nigeria, about five women die during pregnancy, childbirth, or within two months of childbirth noted by TY Danjuma Foundation [81] illustrated in Fig 1. This alarming statistic underlines the urgent need for continuous investment in promoting maternal and child health across the country.

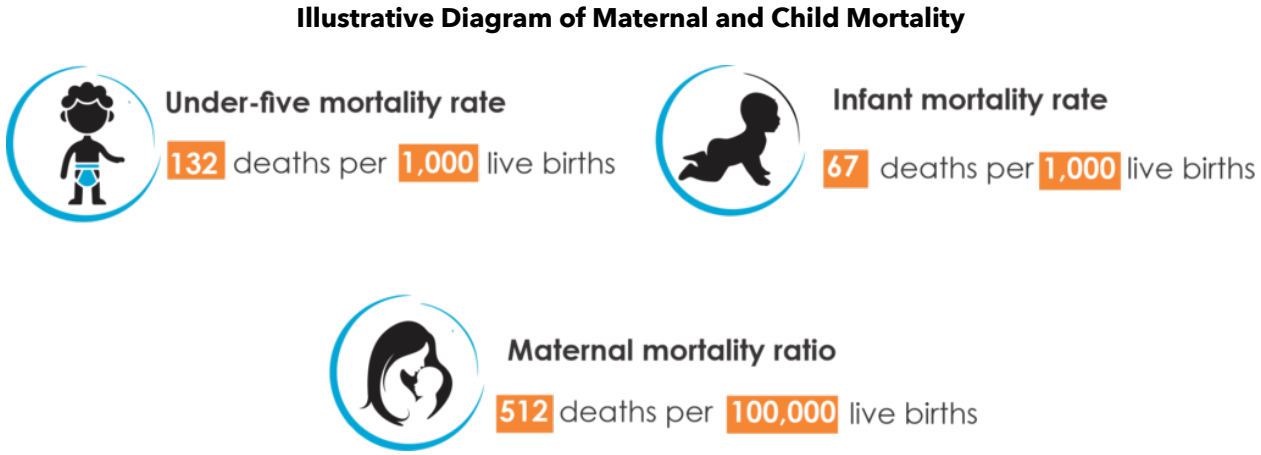

Figure 1. Ratio of Child and Maternal Mortality in Nigeria

Source: adopted from TY Danjuma Foundation [81].

According to UNICEF [18], Nigeria has the highest number of neonatal and maternal deaths in Africa, a situation exacerbated by its large population and high mortality rates. A recent study using data from a household survey

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conducted in 2011 among four northern states—Jigawa, Katsina, Yobe, and Zamfara—highlighted the dire conditions faced by rural women in northern Nigeria. These women were challenged by poor health infrastructure, inadequately equipped health facilities, and unsupportive attitudes towards maternal and child health [19]. In a study by Akokuwebe and Okafor [20], several non-medical factors contributing to poor maternal health in Nigeria were identified. These included widespread poverty, low levels of education, inaccessibility of healthcare services, and un-booked emergencies, in addition to medical factors. These challenges collectively impeded the efforts made to improve maternal health outcomes in the country.

The State of Maternal Health in Nigeria

Nigeria is divided into six geopolitical zones: North-West, North-East, North-Central, South-West, South-East, and South-South. Despite the made efforts such as promoting institutional deliveries and training as well as deploying new skilled health workers, Nigeria currently has one of the highest rates of maternal mortality in the developing world. Hogan et al. [8] identified Nigeria as one of six countries that accounts for 50% of global maternal deaths. The United Nations has also recognised Nigeria as having one of the highest maternal mortality rates globally. Addressing this issue requires not only technical and medical solutions but also significant political commitment and leadership [16]. Numerous studies showed that maternal mortality levels varied across the country. Some states and health facilities report higher maternal mortality rates than the national average. For example, in 2008, Kano State had a maternal mortality ratio (MMR) of 1600 deaths per 100,000 live births, while Zamfara State reported 1049 deaths per 100,000 live births [22, 19]. Additionally, 21 health facilities across three states—Katsina (North), Lagos (South), and the Federal Capital Territory (North)—reported an MMR of 927 deaths per 100,000 live births [23]. Women in the northern regions of Nigeria are less likely to give birth at health facilities. Many live far from healthcare centres, which suffer from severe shortages of health workers compared to the southern regions [24] and Fig 2 illustrates the death ratio of women in south and north from 2008 - 2013. This disparity is a significant concern in the country's health sector, as many women in the north are uneducated and reside in rural areas with limited awareness of the healthcare system and its benefits.

In 2001, Nigeria introduced a National Reproductive Health Policy aiming to halve the national maternal death rate from 800 fatalities per 100,000 live births within five years. However, even 14 years after this target date, the country did not achieve this goal [25]. The WHO's 2019 report highlights the increasing number of maternal deaths in Nigeria, pointing to disparities in access to healthcare between the wealthy and the underprivileged. Among the maternal deaths worldwide, a significant number occurs in developing countries, with a substantial portion happening in Nigeria [26].

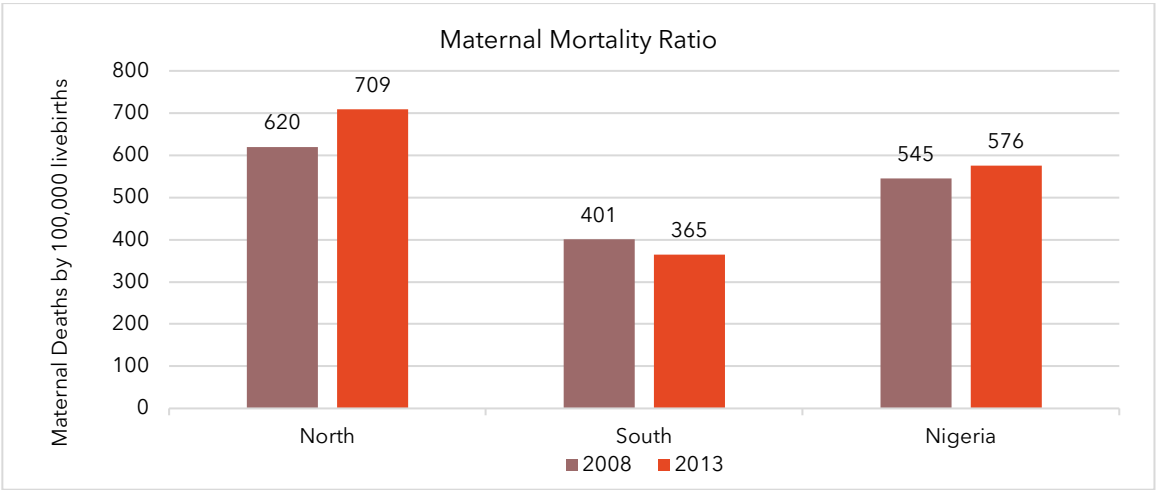

Figure 2. Statistical Ratio of Maternal Death in North, South and Nigeria Overall

Source: Adopted from Meh et al. [24].

Maternal care in Nigeria is structured around three levels: primary, secondary, and tertiary healthcare. Primary health centres are located in all 774 local government areas, providing antenatal care, delivery, and postnatal care. Women with complications are referred to secondary care centres managed by the states or tertiary centres managed by the Federal Government [16]. A study revealed that Nigeria accounted for 28.5 per cent, or approximately 82,000, of the estimated global maternal deaths in 2020, the highest in the world. This was followed by India with 24,000, the Democratic Republic of the Congo with 22,000, and Ethiopia with 10,000, accounting for 8.3 per cent, 7.5 per cent, and 3.6 per cent of global maternal deaths, respectively. Other countries, such as Kenya, Afghanistan, Indonesia, Chad, and Tanzania, reported fewer than 10,000 maternal deaths each in 2020 [27] as shown in Fig 3 below.

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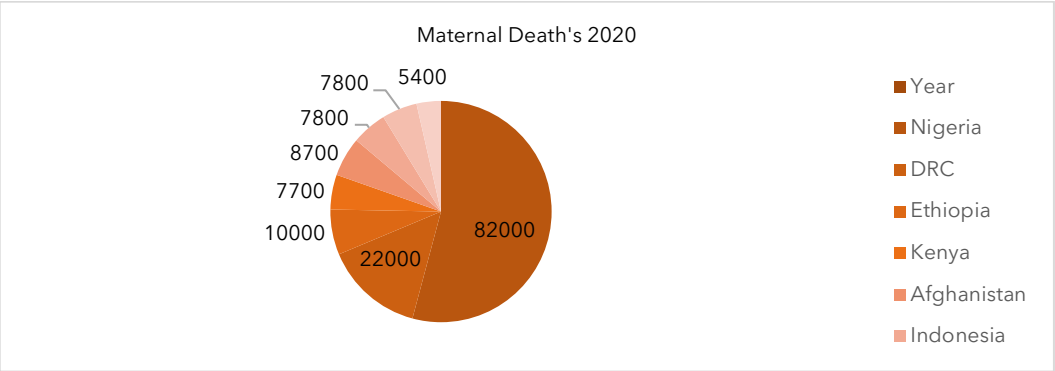

Figure 3. **Maternal Deaths in Nigeria and other selected Countries in 2020**

Source: Adopted from Dauda [28].

Furthermore, the Boko Haram insurgency in Northern Nigeria from 2009 intensified with targeted attacks on government institutions, schools, churches, and other public establishments [29], causing residents in these areas to become internally displaced or refugees in neighbouring countries. Clinical states such as diarrhoea and malnutrition were commonly recorded among displaced persons living in poor conditions with restricted access to health and other basic services. Maternal deaths in the camps were due primarily to excessive bleeding [30]. The reports show that non-indigenous health workers fled from conflict zones to safer states while insurgents destroyed and removed medical supplies from health facilities. This conflict possibly influenced the level of maternal mortality in the North in 2013 compared to that of 2008 due to its devastating impact on the health system. For instance, Borno state capital received several internally displaced persons while one of its prominent health facilities recorded 76 maternal deaths within 6 months in 2009 [31, 32]. This may indicate a strain on the health system which in turn affects the health of people already adversely affected by the conflict. This finding exposes again the Nigerian healthcare system as not being placed among the top priorities budgets of the country by the Nigeria Government, thereby leaving many Nigerians' women's fates to luck and chance as the case may be. Another research by Ezegwui et al. [36] in Abakaliki public teaching hospital in Nigeria (Table 1) found that there were nine maternal deaths and the total delivery for that year was 1,189, giving an MMR of 757 per 100,000 deliveries. The peak MMR of 4,000 per 100,000 deliveries occurred in 1999. After 1999, there was a continuous regression in subsequent years with a slight rise in 2003 and a sharp drop in 2004, giving an MMR of 1,510 per 100,000 and 860 per 100,000 total deliveries, respectively.

Table 1. **Annual trend of maternal mortality ratio**

Year	Number of total deliveries	Maternal deaths	Maternal mortality ratio
1999	375	15	4,000
2000	349	13	3,725
2001	609	20	3,284
2002	1512	20	1,323
2003	1722	26	1,510
2004	2325	20	860
2005	1728	16	926
2006	1550	20	1,290
2007	1228	12	977
2008	1189	9	757
Total	12,587	171	1,359

Total number: 171, Location: Abakaliki, Ebonyi state, Period: 1999-2008

Source: Adopted from Ezegwui et al. [36]

Common Causes of Maternal Mortality in Nigeria from the Previous Findings

Between 1990 and 2015, the global maternal mortality ratio decreased nevertheless the reduction rate in Nigeria has lagged behind the rest of Africa [2]. A study by Azuh et al. [33] on maternal morbidity and mortality in rural

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communities in South-Western Nigeria identified malaria and fever as the most prevalent illnesses contributing to maternal mortality, with 80.3% of respondents citing them as the most common. Other contributing illnesses included typhoid (13.9%), headache (1.9%), cold/cough (3.3%), diarrhoea (0.3%), and diabetes (0.3%). Okonofua et al. [34] conducted a research in order to understand the causes of maternal death in low-income countries. They found that women were generally aware of the medical causes of maternal death, with the main issues being delays in reaching hospitals or receiving care upon the arrival. Consistent with global data, several studies identified the major causes of maternal mortality in Nigeria. Approximately 70 per cent of maternal deaths in the country are due to five main complications: haemorrhage, infection, unsafe abortion, hypertensive diseases of pregnancy such as eclampsia, and obstructed labour. Severe challenge of malnutrition is mostly in the sub-Saharan African countries, south-eastern and south-central Asian countries, and Yemen, where more than 20% of women have a Body Mass Index (BMI) of greater than 18.5 kg/m^2 [35], the short physique of a mother and iron deficiency anaemia can increase the mother's risk of death at delivery, contributing to at least 20% of maternal deaths. During routine check-ups for women, like prenatal care, some occurrences can be anticipated, while others happen suddenly without warning signs, posing significant risks during pregnancies. Nigeria's fragile healthcare system places Nigerian women at heightened vulnerability to such complications, necessitating prioritised attention. Predictors of high-risk pregnancies during prenatal care include conditions like high blood pressure, gestational diabetes mellitus, premature rupture of membranes, gestational age exceeding 42 weeks, and vaginal bleeding, among others. Additionally, prevalent factors contributing to high-risk pregnancies in Nigeria include advanced maternal age (over 35 years), anaemia, and infections, which are major contributors to maternal mortality. It's important to note that many studies are hospital-based and may not fully capture mortality rates during home deliveries [37].

Maternal Mortality Interventions in Nigeria and Factors Affecting Its Rate

Efforts to reduce maternal and child mortality in Nigeria have been pursued through various strategies such as poverty alleviation [38], public education, and quality control measures [39], as well as initiatives like National Insurance Schemes [40]. Despite these efforts, significant gaps remain in effective monitoring and comprehensive mechanisms to enhance maternal health outcomes [41, 42]. For instance, the Midwives Service Scheme, which aims to increase the access to skilled birth attendance, has been hindered by inadequate infrastructure and difficulties in retaining midwives [43]. Quality control measures, such as the WHO Safe Childbirth Checklist and Maternal Death Reviews, intended to reduce the childbirth risks and improve obstetric care, lack effective training, supervision, and leadership engagement, which are crucial for their successful implementation [44]. Additionally, interventions utilising information and communication technology, such as Mobile Community Based Surveillance, Open Medical Record System, and projects like the Abiye Safe Motherhood (Mobile-Health) Project, aim to enhance medical diagnostics and healthcare utilization. However, these initiatives have faced challenges such as user illiteracy and discrepancies between design specifications and user requirements [45, 46]. However, maternal mortality in Nigeria is influenced by a complex interplay of factors categorized into medical, socio-economic, cultural, behavioural, and political causes.

Medical and Healthcare System Factors

The access to the healthcare in Nigeria faces significant challenges, including inadequate physical infrastructure [47, 48], insufficient human and clinical resources, and dysfunctional primary and specialized healthcare facilities [49]. These issues are compounded by overstretched tertiary medical centres [50], contributing to prolonged waiting times, evident stress among healthcare providers, and poor health outcomes for women [47, 50]. Consequently, many women fail to utilise maternity clinics, present late in their pregnancies, and receive inadequate obstetric care [51]. Low healthcare utilisation remains a significant barrier to maternal health in Nigeria, with less than half of women attending recommended prenatal care and only a slight increase in facility-based deliveries from 2008 to 2013 [52]. Sageer et al. [53] examined maternal mortality in Ogun State, Southwest Nigeria, and identifying haemorrhage as the leading cause of maternal deaths. Likewise, Ujah et al. [14] found that sepsis is a significant risk factor for maternal mortality in Nigeria's North-central region, based on a comprehensive analysis of hospital records over 17 years. A retrospective study on the number and pattern of obstetric deaths at the Central Hospital in Benin City over a ten-year period by Abe & Omo-Aghoja [55] found that, apart from direct causes, indirect causes such as institutional difficulties, low literacy, high poverty levels, extremes of parity, and non-utilisation of maternity services were associated with maternal mortality. Another study at Nnamdi Azikiwe University Teaching Hospital highlighted sepsis as a leading cause of maternal deaths, linking infections during pregnancy to unsanitary conditions and physiological changes that increase susceptibility to infections [56]. Preeclampsia and eclampsia also significantly contribute to maternal mortality in Nigeria, with challenges in diagnosing and managing these conditions due to inadequate laboratory facilities and fragmented healthcare delivery systems [57]. Post-caesarean hypertension remains a critical issue, contributing to hospital-based maternal mortality, characterised by complications such as high blood pressure and renal abnormalities [58]. Other health factors impacting maternal mortality include diabetes, typhoid, heart disease, placenta previa, and malaria [33]. Tackling these challenges involves enhancing the quality of medical

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services, guaranteeing that deliveries are supervised by qualified professionals, and improving access to obstetric and emergency care, especially in rural areas where healthcare facilities are limited and hard to reach [59].

Socio-economic Factors

The reasons behind poor healthcare utilisation in Nigeria are numerous and complex. Financial barriers, such as the inability to afford the healthcare costs or transportation expenses to hospitals, play a significant role [21, 47]. Additionally, the absence of antenatal clinics in rural areas and insufficient education, along with misinformation regarding hospital deliveries, further exacerbate the issue [60, 61]. Patriarchal control over women's pregnancy decisions, coupled with reliance on religious beliefs and superstitions over medical advice, also contributes to poor healthcare utilization [62]. Homebirth remains prevalent in parts of Ogun State, posing significant risks due to long distances to hospitals, poor transportation, and inadequate roads, leading to delays in accessing emergency care during complications like excessive bleeding [53]. Limited access to family planning, misuse of contraceptives, and a lack of empowerment for women to control their reproductive choices negatively impact maternal health outcomes. Despite the proven effectiveness of contraceptives in preventing unwanted pregnancies and associated complications, stigma and judgment from healthcare providers—particularly toward adolescent girls deemed promiscuous—discourage women from seeking guidance. This situation contributes to unsafe abortions and increased risks of sexually transmitted diseases, exacerbating maternal mortality in Nigeria [63, 64]. Efforts are being made through public education to empower women's reproductive rights, promote maternal care access, and encourage informed contraceptive choices. However, fundamental medical causes of maternal mortality remain inadequately addressed. Pregnancy-related deaths, as highlighted by Akokuwebe and Okafor [20], continue to pose a critical health challenge, particularly for women from low socioeconomic backgrounds who struggle to access adequate healthcare services, including reproductive health services. Challenges such as lack of awareness about chronic conditions among women and disparities in attention between direct and indirect medical causes further complicate efforts to improve maternal health outcomes [51]. These issues emphasise the need for healthcare practitioners to regularly screen pregnant patients for underlying health conditions and be prepared to manage obstetric emergencies effectively. Basic amenities like electricity and water supply are unreliable, contributing to the dismal state of the healthcare sector [16].

Cultural and Behavioural Factor

Certain traditional African beliefs and practices negatively impact maternal health outcomes by discouraging the use of formal antenatal clinics. For example, the use of locally brewed herbal remedies instead of prescribed medications and seeking spiritual guidance from non-medical leaders are common practices [62]. Salami & Taiwo [66] highlighted various cultural practices across sub-Saharan Africa, including Nigeria that contributes to maternal and infant mortality. Among the Ibani people of Rivers State, cultural norms restrict pregnant women from participating in certain festivals under threat of severe punishment, disregarding their health needs [67]. In Northern Nigeria, the purdah system limits women's mobility, hindering access to medical care during emergencies, and there is often a preference for female health practitioners during childbirth [68]. Similarly, the Oro festival among the Yorubas in southern Nigeria restricts women's movement, impacting their access to timely medical assistance [68]. Cultural factors, such as Islamic beliefs that undervalue women, widespread illiteracy among women, early marriage, and harmful traditional medical beliefs, significantly contribute to maternal mortality [68]. Additionally, societal norms where a husband's approval influences prenatal care utilisation more than the wife's desire for pregnancy or her education level further exacerbate these challenges [69]. Women in higher socioeconomic groups tend to use maternal health services more frequently, partly due to education, which influences their autonomy and decision-making power within their families [70]. However, cultural norms often restrict women's autonomy and limit their participation in healthcare decision-making. Discrimination against certain ethnic or religious groups within healthcare settings also deters their use of services [71]. Community-based studies reveal that many pregnant women in Nigeria have limited contact with the healthcare system due to cultural customs, lack of perceived need, distance to healthcare facilities, transportation challenges, and lack of permission, costs, and reluctance to see male doctors [72].

Political Factors

Political influences and national funding arrangements play a major role in healthcare quality implementation and systems development [73]. A robust political commitment centred on the rule of law, equitable institutional frameworks, and a diverse coalition of patients, medical professionals, activists, technicians, politicians, and other stakeholders dedicated to decreasing maternal mortality creates a powerful foundation for mitigating risks in maternal and infant care [74]. However, politicians can create partisan healthcare policies by aligning national

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healthcare quality agendas with their political aspirations. Such politically driven tendencies can lead to poor quality care and a loss of public trust in governments [73]. Research indicates that countries with a low political priority for maternal healthcare, such as Nigeria, Guatemala, Honduras, India, and Indonesia, have high maternal mortality ratios [75]. In Nigeria, a lack of political commitment towards commercializing magnesium sulphate (MgSO4) drugs to treat pre-eclampsia, a major cause of pregnancy-related mortality in the northern region [57] and making antiretroviral drugs accessible to women with HIV/AIDS [76], has contributed to high maternal mortality in the country. Corruption in the political system is endemic, while social development, including the promotion of the health of Nigerian citizens, has been more a rhetorical than a real aim of the state [16]. Corruption in Nigeria's political system and profoundly affects the healthcare sector. Funds allocated for healthcare are often misappropriated, leading to a lack of essential resources in hospitals and clinics. This financial mismanagement means that many healthcare facilities are underfunded, understaffed, and poorly equipped, which directly impacts the quality of maternal care. The systemic corruption undermines efforts to improve healthcare infrastructure and services, leaving many women without access to necessary prenatal and emergency obstetric care.

Identified Effects of Factors Leading to Maternal Mortality in Nigeria

Table 2. Identified factors leading to maternal mortality in Nigeria

Identified Factors	Effects
Inadequate Healthcare Infrastructure	- Restricts access to essential medical care - Results in delayed treatments, increasing risk of complications - Requires long travel distances to reach functional healthcare facilities - Overburdened tertiary centres lead to long waiting times and diminished quality of care
Shortage of Skilled Healthcare Professionals	- Leads to subpar care and mismanagement of pregnancy-related complications - Women in rural and underserved areas often seek care from traditional birth attendants - Preference for noninstitutional childbirth due to perceived empathy from local birth attendants [77, 78] - Unsatisfactory healthcare attributed to nonchalant attitudes, unfriendly staff, and insufficient facilities [34]
Poverty and Limited Access to Education	- Restricts women's ability to afford healthcare services, nutritious food, and transportation - Reduces awareness of maternal health services and the importance of prenatal and postnatal care - Contributes to poor health-seeking behaviours and higher maternal mortality rates; thereby necessitating the need for collaboration between healthcare workers and expectant mothers for infection prevention [56]
Cultural Barriers and Discouragement from Using Modern Medical Services	- Deters women from seeking professional medical care - Preference for traditional birth attendants who may not handle complications - Delays or avoidance in seeking medical care due to lack of awareness or fear of medical interventions
Insufficient Government Funding and Policies	- Leads to inadequate healthcare facilities and resources - Weak policies fail to address specific maternal healthcare needs - Gaps in service provision and coverage due to insufficient government funding and ineffective policy framework

Source: author's compilation

Possible Solutions to Solving the Problem of Maternal Mortality in Nigeria

Investing in the construction and renovation of healthcare facilities, particularly in rural and underserved regions, is essential to guarantee that women can access quality care close to home. Enhancing the healthcare referral system is also essential to guarantee timely and efficient transfer of patients from primary to tertiary care centres. Nigerian hospitals need to be adequately stocked with the latest medications and equipment, and the blood bank systems should be sufficiently supplied. Healthcare workers should receive fair remuneration, and the workforce should be expanded to address shortages. Fostering a supportive working environment is essential to mitigate the substantial brain drain in the health sector. This can be achieved by increasing the budget for the Nigerian health sector and pursuing additional sources of support from donor organisations are necessary steps. Efficiently expending the budget and donations through sustainable institutional and structural frameworks will also be crucial. Private firms in Nigeria's health sector should receive tax incentives and affordable credit facilities to enhance their capacity to provide quality healthcare at more affordable rates. This increase in budgetary allocation and donations to public

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hospitals will make quality maternal healthcare accessible and affordable for all. Implementing targeted training programs to boost the number of skilled birth attendants and healthcare providers specialising in maternal health is essential. Continuous training and retraining in maternal care will help healthcare workers recognize danger signs and provide quality antenatal, postnatal, and childbirth care, thereby preventing maternal deaths. Offering better salaries, housing, and career advancement opportunities will help retain healthcare professionals in underserved areas.

Addressing Socio-economic Barriers and Promoting Cultural and Behavioural Change

To empower women in making informed health decisions, it is crucial to implement policies that address poverty reduction and enhance access to education for women. Offering financial assistance or subsidies for maternal healthcare services is essential to guarantee that all women, regardless of their economic situation, can access quality care. Additionally, improving road infrastructure and ensuring the availability of ambulances will facilitate better access to hospitals. Addressing the current security issues in the country is also vital to ensure safe and quick access to maternal care. Engaging with community leaders and using culturally sensitive approaches to educate communities about the importance of modern maternal healthcare is crucial. Integrating traditional birth attendants into the formal healthcare system through training and collaboration will ensure they can identify and refer high-risk cases. Sensitizing women and expectant mothers about the importance of receiving maternal care from hospitals, in partnership with organisations like the World Health Organisation, will increase their willingness to seek prenatal and postnatal care. Public awareness campaigns should be launched to educate women and their families about the importance of prenatal, delivery, and postnatal care. Establishing mobile health clinics and outreach programs will help reach women in remote areas, providing them with necessary information and services.

Strengthening Political Commitment

It's crucial to push for more government funding and resources specifically for maternal and child health programs. We need to create and enforce comprehensive health policies that tackle the different factors leading to maternal mortality at every level of government. Making maternal health a key topic in political discussions and using it as a measure of governance and economic performance is also important. Implementing a program to track maternal mortality rates will help us evaluate how well our policies are working and identify ways to reduce maternal deaths even further.

Discussion

The study on maternal mortality in Nigeria presents a compelling analysis of a pressing public health issue, highlighting socio-economic, cultural, and healthcare system factors as key drivers. The maternal mortality ratios of 512 deaths per 100,000 live births in Nigeria [17] and 717 deaths per 100,000 live births in Sierra Leone, as reported by the Sierra Leone Demographic and Health Survey [79], highlight the gravity of the issue in comparable settings. Both countries face challenges such as delayed healthcare-seeking behaviours among pregnant women, which contribute significantly to adverse maternal health outcomes. International assessments have consistently ranked Nigeria's healthcare performance poorly, with significant deficiencies in the provision of essential obstetric care. Approximately two-thirds of all Nigerian women deliver outside of health facilities and without medically skilled attendants. The lack of knowledge among women, their families, and communities about the importance of antenatal care, institutional delivery, and family planning results in low attendance at health services. Omoruyi [65] identified factors like low literacy, extreme poverty, high parity, and underutilisation of maternity services as contributing directly and indirectly to maternal deaths in Nigeria. The overall healthcare system faces significant challenges, including poor service quality, unfriendly staff attitudes, inadequate skills, crumbling infrastructure, and chronic shortages of essential medications. Additionally, the high cost of healthcare, along with issues of poverty, hunger, and the lack of access to essential social services, compounded by transportation challenges and distance, plays a significant role in exacerbating the problem. Poor patronage of healthcare services is also prevalent, as health staff is often perceived as rude and uncaring towards women. The lack of skills, equipment, tools, and drugs among health staff exacerbates the problem. Many healthcare facilities are dilapidated, closed at night, and lack essential utilities like electricity and potable water. Moreover, referral services are slow and unreliable, meaning that life-saving care is often not provided in a timely manner. Deep-seated cultural beliefs significantly impede quality healthcare delivery in Nigeria. These beliefs, rooted in cultural and religious ideologies, influence individuals' perceptions of health and illness, leading some to view illnesses as predetermined or inevitable, reducing proactive health-seeking behaviour and the perceived importance of health insurance coverage. Additionally, financial barriers and gender bias due to religious or cultural beliefs further exacerbate the issue. Inequality in the distribution of healthcare facilities between urban and rural areas also plays a critical role, with rural areas often having limited access to quality care. Traditional healing practices, including herbal remedies and spiritual interventions, are prominent in Nigerian culture, endangering pregnant women who are unaware of modern medical healthcare practices or systems. Many people trust traditional healers and alternative medicine, viewing these practices as effective and culturally familiar due to lack of exposure and education. This reliance on traditional medicine over modern healthcare services can

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contribute to higher maternal mortality rates, as women may not seek necessary medical care during pregnancy and childbirth.

Asogwa et al. [80] conducted an investigation at the Nsukka Health Centre and the University of Nigeria Teaching Hospital, providing further insights into the issue. The authors identified personal factors such as poverty, illiteracy, and delays in seeking healthcare as critical determinants of maternal mortality. Moreover, cultural beliefs attributing maternal deaths to witchcraft, evil spirits, and infidelity were reported, although contrasting findings suggest that reliance on traditional remedies and spiritual guidance also play roles in deterring women from formal antenatal care. Comparing these findings with existing literature, similarities in the socio-cultural barriers to maternal healthcare access across different regions are apparent. However, discrepancies arise regarding the specific beliefs and practices influencing healthcare-seeking behaviours, indicating variations in local contexts. This divergence highlights the nuanced nature of maternal health challenges and underscores the need for tailored interventions that address local beliefs and practices. In evaluating the credibility of these results, the methodological rigor of Asogwa et al.'s [80] qualitative approach at two prominent healthcare facilities in Nigeria provides valuable insights grounded in empirical evidence.

The identification of cultural factors alongside socio-economic determinants enriches our understanding of the complex interplay influencing maternal health outcomes. From a scientific perspective, these findings accentuate the importance of culturally sensitive healthcare interventions and the integration of traditional practices into modern maternal health strategies. Therefore, addressing maternal mortality in Nigeria requires a multifaceted approach that respects and incorporates cultural nuances alongside other factors. By doing so, healthcare policies can be more effectively tailored to meet the needs of diverse populations, ultimately improving maternal health, and reducing mortality rates.

Conclusions and Implications

The study identified several key factors influencing maternal mortality in Nigeria, each explicitly linked to specific findings. Medically, major causes of maternal mortality included haemorrhage, infection, unsafe abortion, hypertensive diseases, and obstructed labour, consistent with previous research. Socio-economic factors such as poverty, lack of transportation, and unavailability of electricity were critical determinants, limiting access to healthcare services and hindering timely medical intervention. Cultural beliefs and practices, including reliance on traditional medicine and perceptions of maternal deaths as spiritual punishments, deterred women from seeking formal medical care, contributing to higher mortality rates. Behavioural factors like delays in seeking healthcare and low utilisation of antenatal care services were influenced by both socio-economic and cultural elements, similar to patterns observed in other African regions. Politically, inadequate funding for healthcare infrastructure and ineffective policy implementation significantly contributed to maternal mortality, highlighting the need for robust political commitment and investment in maternal health. To improve the healthcare infrastructure, it is recommended upgrading facilities, increasing healthcare personnel, enhancing supply chains for medicines, and integrating technology such as telemedicine, particularly in rural areas. Educational programs should be implemented to raise awareness about antenatal care and institutional delivery, while policy implementation needs to be strengthened to ensure effective healthcare reforms. Engaging community leaders and traditional healers in health education can bridge the gap between traditional and modern medical practices. Future research should explore innovative approaches to integrating traditional practices with evidence-based medical care and investigate specific local cultural beliefs to develop contextually appropriate interventions. By outlining these factors and strategies, this study presents a thorough framework for tackling maternal mortality in Nigeria, offering valuable insights for policymakers, healthcare providers, and community leaders to enhance maternal health outcomes.

Suggestions for Future Research

Future research could explore innovative approaches to reconcile traditional beliefs with contemporary medical practices. This might involve engaging with communities and setting up educational programs to help people understand and accept contemporary healthcare practices. Such efforts could greatly improve maternal health outcomes. This study also questions the assumption that cultural influences on maternal healthcare are uniform. By highlighting the role of various cultural practices and beliefs, it lays the groundwork for creating strategies that are sensitive to local contexts and effective in reducing maternal mortality rates in Nigeria and similar places. Future research could explore these cultural practices in more detail, identifying which ones are helpful and which ones might be harmful. This would help in crafting interventions that respect cultural differences while ensuring the safety of maternal health practices. Additionally, research could focus on the socio-economic and political factors that worsen maternal mortality. Looking into how poverty, education levels, healthcare infrastructure, and government policies affect maternal health could uncover important barriers and opportunities for improvement. Long-term studies on the success of different policy interventions would be particularly useful. Finally, combining insights from medical, social, and behavioural sciences could provide a more complete understanding of maternal health issues.

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Working together with anthropologists, sociologists, medical professionals, and policymakers could lead to comprehensive strategies that tackle the many aspects of maternal mortality. By taking a multidisciplinary approach, future research can help develop more effective and lasting solutions for reducing maternal mortality rates in Nigeria and beyond.

Declarations

Author Contributions

Conceptualization, Vivian Idama and Dr. Akinyemi Akinniyi Omolade; methodology, Itohanosa Omolara Osarhiemen and Vivian Idama; software, Vivian Idama; validation, Vivian Idama, Itohanosa Omolara Osarhiemen, and Ajilora Busola Glory; formal analysis, Vivian Idama and Itohanosa Omolara Osarhiemen; investigation, Vivian Idama and Itohanosa Omolara Osarhiemen; resources, Vivian Idama and Itohanosa Omolara Osarhiemen; data curation, Vivian Idama; writing—original draft preparation, Itohanosa Omolara Osarhiemen and ; writing—review and editing, Itohanosa Omolara Osarhiemen and Vivian Idama; visualization, Vivian Idama and Ajilora Busola Glory; supervision, Dr. Akinyemi Akinniyi Omolade; project administration, Vivian Idama; funding acquisition, Dr. Akinyemi Akinniyi Omolade. All authors have read and agreed to the published version of the manuscript.

Data Availability Statement

Data available in a publicly accessible repository: The data presented in this study are openly available in Nigerian Government Websites, NGO(s), Google Scholar, Researchgate, Scopus and Web of Science Journals.

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Ethical review and approval were waived for this study due to the fact that the research is a review paper involving already existing data on open source.

Informed Consent Statement

Not Applicable

Conflicts of Interest

The author declares that there is no conflict of interests regarding the publication of this manuscript. In addition, the ethical issues, including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, and redundancies have been completely observed by the authors.

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