

Research Article

Analysis of Socio-demographic Determinants of Maternal Death in Dekina Local Government Area of Kogi State, Nigeria

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Abstract

Maternal death constitute a major challenge confronting the entire world. It continue to be one of the world's most serious public health issues, especially in low- and middle-income nations like Nigeria and many Sub-Saharan African nations. This study look into the socio-demographic factors determining maternal deaths in Dekina Local Government Area, Kogi State, Nigeria. The investigation was conducted using the Three Delay Model of maternal mortality (3DM) as s theoretical foundation. 384 respondents were asked to complete copies of the questionnaire using a multi-stage sampling technique. A combination of approaches was used in the investigation. This means that it blends the quantitative (using a self-administered structured questionnaire with open-and closed-ended questions as its instrument) and qualitative (using in-depth interviews) methods of data collection. The data were analyzed using the percentages and frequency distribution tables. The study discovered that maternal death in the study is high due to factors that are socio-demographic in nature, which include; maternal age, marital status, religious belief, employment status, income level, occupation, parity, cultural belief, educational qualification, place of residence/geographical location, and healthcare accessibility. The study further found the improvement in access to skilled birth attendants, improving community education/awareness, improving antennal and post-natal care, family planning/child spacing practice, capacity building for healthcare workers, improving healthcare infrastructure, improving nutrition and anemia, tackling of gender inequality, and addressing socio-cultural barriers as strategic measures for reducing maternal death in Dekina Local Government Area.

Keywords

Analysis, Death, Dekina, Maternal Death, Socio-demographic

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1. Background to the Study

Despite significant improvements in healthcare, maternal mortality or death continues to be one of the world's most serious public health issues, especially in low- and middle-income nations like Nigeria and many Sub-Saharan African (SSA) nations. This represents a violation of fundamental human rights, reflecting health and socioeconomic inequalities among individuals [11]. Pathetically, two hundred and eighty-seven thousand (287,000) women (mothers) worldwide pass away each year from pregnancy- and delivery-related reasons, the most of them are from developing nations, even though these deaths may be avoided if women gave birth in a medical facility.

Sub-Saharan Africa alone is responsible for about 56% of all the maternal deaths in the world. According to [28], for every 26 mothers, one dies from pregnancy and childbirth in Sub-Saharan Africa. And Nigeria is the most populous and the leading contributor of maternal death in Africa with an estimated 52,000 annual deaths, a figure which put the country as the second-highest after India [21, 4, 15].

It is worthy of note to state that various strategic measures including the National Health Policy (NHP), the Safe Motherhood Initiative (SMI), and the establishment of Primary Health Care (PHC) centers has been employed by the Nigerian government in partnership with international bodies such as the World Health Organization (WHO), the United Children's Fund (UNICEF), the United Nations Population Fund (UNFPA), and the Millennium Development Goals (MDGs) and the Sustainable Development Goals (SDGs) to strengthen maternal health services and increase access to skilled birth attendants [32].

These measures however, have been met with mixed results due to poor policy implementations, inadequate funding, and systemic corruption have hindered the success and effectiveness of these initiatives [1]. In addition, the fragmented nature of Nigeria's healthcare system, with a lack of coordination between federal, state, and local governments, exacerbates the challenges in reducing maternal mortality. Consequently, the maternal mortality ratio in Nigeria still remains far above the target, signaling the need for intensified efforts [30]. Although, a number of few related studies have been carried out only in some semi-urban areas of Dekina Local Government Area. These studies were however limited to Anyigba community, hence, the hunch for this study that aimed at examining the socio-demographic determinants of maternal death in Dekina Local Government Area.

2. Research Objectives

The specific objectives of the study include:

1. To examine maternal death situation in Dekina Local Government Area.
2. To investigate the socio-demographic determinants of maternal death in Dekina Local Government Area.
3. To find out the measures for reducing maternal death in

Dekina Local Government Area.

3. Literature Review

The rate of maternal deaths across the globe especially in low income countries is very high. In 2015 alone, preventable maternal mortality during and following pregnancy and childbirth especially in low-resource settings was estimated to roughly 303,000 [22]. Many socio-demographic factors play key roles in determining maternal death. For instance, education, employment, and health beliefs, access to health care services, and individual's health risks such as obesity, underlying medical conditions and age at pregnancy are determinants of maternal mortality [31]. In addition, women who are over 35 years old and those who are under the age of 18 are especially susceptible to maternal death [19].

Older women have greater chances of mortality because they are more likely to experience problems like preeclampsia, placenta previa, and gestational diabetes [29]. Additionally, [13] posited that a higher level of maternal education is linked to significantly lower rates of maternal mortality in under-developed nations. In addition, access to maternal healthcare services may be hampered for single moms, especially widows and unmarried women by additional obstacles such as lack of support, economic difficulty, and social stigma. Again, women from lower-income households are also more likely to suffer from food insecurity, malnutrition, and other conditions that negatively impact maternal health. Again, women who are undernourished may not be as physically resilient to endure the rigours of pregnancy and labour and are more likely to experience difficulties during childbirth [5].

Furthermore, lack of healthcare facilities, scarcity of healthcare providers and inadequate transportation system which are the frequently attributes of rural locations makes it difficult for women in such areas to be faced with difficulties in receiving high-quality maternal health treatments [1]. More so, rural healthcare institutions frequently lack the resources, staff, and equipment needed to handle complex deliveries or offer emergency obstetric care [16]. Some cultural beliefs prioritize home births assisted by traditional birth attendants over facility-based deliveries, which increases the risk of complications that cannot be managed outside of a medical setting [10]. [2] identified poverty among other socio-demographic factors encouraging high percentage of non-use of maternal healthcare services.

In order to meet up with the Sustainable Development Goal (SDG) objective of fewer than 70 deaths per 100,000 in 2030, [23] advised that developing countries should enhance their preventative interventions to reduce their high mortality rate. One of the ways of achieving this is through competent treatments can lower maternal morbidity and death prior to during, and following childbirth [20]. Similarly, the development of public policies that energetically address the great

gaps in equity, the allocation of necessary resources for the implementation of such public policies, the generation, dissemination and the use of evidence to inform public policies, the strengthening of citizen participation and accountability, improvement in the quality of maternal and sexual and reproductive health care, investing in health workforce, identification of barriers, ensuring universal access to contraceptive methods, and address the sexual and reproductive health needs of adolescent populations, recognition of women's rights and their impact on country development are capable of reducing maternal death [14].

4. Theoretical Framework

This study is anchored on the Three Delays Model (3DM) for the explanation of maternal death in Dekina Local Government Area of Kogi state.

4.1. Three Delays Model of Maternal Mortality

The Three Delays Model usually refer to 3DM for short is a theoretical framework developed by Thaddeus and Maine in 1994 to facilitate the identification of factors that from the onset of obstetric complications to the birth of the baby, contribute to maternal death especially in low-income settings of human world. According to the model, adverse outcomes from obstetric complications are attributable to three delays between the onset of complications and their ultimate outcome [27]. In what seems to be an affirmation, [26] stated that, extensively the model has been applied in maternal health literature to understand the factors influencing maternal mortality in human society.

The Three Delay Model of Thaddeus and Maine was classified and categorized into three delay factors which include:

1. Delay in the decision to seek care.
2. Delay in the arrival at a health facility.
3. Delay of the provision of adequate care after she reaches a health facility.

4.1.1 Delay in Deciding to Seek Care (First Delay)

The first delay is concern with the decision to seek healthcare services, influenced by socio-demographic factors such as age, parity, cultural and social belief, education qualification, autonomy and gender roles, perception of healthcare quality, and financial barriers refer to as income level [24, 12, 18, 17, 6].

4.1.2 Delay in Reaching Healthcare Facilities (Second Delay)

The second delay is based on the decision to seek care, influenced by geographical and infrastructural factors such as geographical distance, availability of transportation means, road infrastructure, and communication barriers [12, 9, 25].

4.1.3 Delay in Receiving Adequate Care at the Facility (Third Delay)

The third delay pertains to the delay in receiving adequate and appropriate care after reaching a healthcare facility. These include factors such as quality of care, healthcare workforce shortages, cost of care at the facility, systemic healthcare inefficiencies, and discrimination and mistreatment [24, 25, 6].

4.2. Applicability of the Three Delays Model

Applicably, the Three Delays Model provides a thorough framework for comprehending maternal mortality in Dekina Local Government Area of Kogi state, Nigeria by highlighting the various socio-demographic factors that raise the area's high rates of maternal death.

5. Methodology

Study Design/Setting

The survey research design was adopted to study the three hundred and eighty-four (384) study's respondents (women within the age of 15-49 years). This study was carried out in four (Emewe, Odu I, Oganenigu, and Ojikpadala) purposively selected areas in the Local Government Area. The Local Government Area is one of the nine (9) Local Government Areas in Kogi East. It consists of three (3) districts (Biraidu, Okura and Dekina) and has twelve (12) (Abocho, Anyigba, Ojikpadala, Dekina, Emewe, Odu I, Odu II, Egume, Iyale, Oganenigu, Ogbabede and Okura) council wards. The population of the Local Government Area was projected to be 351,700 [7]. The multistage sampling technique was adopted to select three hundred and eighty-four (384) respondents. In-depth interviews were conducted in each of the selected areas. Statistical Package for Social Sciences (SPSS) was used to evaluate the quantitative data. Descriptive analysis was done on the qualitative information obtained through in-depth interviews (IDI) to support the quantitative findings.

6. Results

Table 1. Percentage Distribution of Scio-Demographic Characteristics of Respondents.

Variables	Category	Frequency (378)	Percentage (%)
Age in years:	15-19	91	23.7
	20-24	80	20.8
	25-29	58	15.1
	30-34	55	14.3
	35-39	51	13.3
	40+	49	12.8
Religious Belief:	Islam	173	45.1
	Christianity	153	39.8
	African Trad. Rel.	58	15.1
Marital Status:	Single	86	22.4
	Married	108	28.1
	Separated	60	15.6
	Divorced	63	16.4
	Widow/widower	67	17.4
Educational Attainment:	Non formal	60	15.6
	Primary	109	28.4
	Secondary	107	27.9
	Tertiary	99	25.8
Ethnic Afiliation:	Igala	176	45.8
	Okun/Yoruba	78	20.3
	Ebira	53	13.8
	Others	77	20.1
Occupation:	Unemployed	81	21.1
	Private sector employee	38	9.9
	Civil servant	58	15.1
	Business/Trading	161	41.9
	Other	46	12.0
Monthly Income:	Less than ₦30,000	100	26.0
	₦30,000-₦34,000	84	21.9
	₦35,000-₦39,000	75	19.5
	₦40,000-₦44,000	58	15.1
	₦45,000+	67	17.4

Source: Field Survey, 2024

Table 1 above shows the socio-demographic distribution of the respondents. From the results, it is shown that all the study's respondents were female (15-49 years old). The results also indicated that majority (23.7%) were within the ages of 15-19, 20.8% were within the age of 20-24 years, 15.1% were within age 25-29 years, 14.3% were within the age of 30-34 years, 13.3% were within the age of 35-39 years, and 12.8% were within the age of 40 years and above.

Additionally, results indicated that 45.1% of the respondents practice the Islamic religion, 39.8% practices Christianity, and 15.1% practices the African Traditional Religion (ATR). Furthermore, the results indicated that 22.4% were single, 28.1% were married, 15.6% were separated, 16.4% divorced, and 17.4% were either widow or widower. 15.6% were found

to have non-formal education, 28.4% were found to have primary education, 27.9% were found to have secondary education and 25.8% were found to have tertiary education.

Finally, the study also found that 45.8% were Igalas, 20.3% were Okun/Yoruba, 13.8% were Ebiras, and 20.1% belongs to other tribes. It was also found that 21.1% were unemployed, 9.9% were employed in the private sectors, 15.1% were civil servants, 41.9% were into business or trading and 12.0% were engaged in other activities. Results from the study also indicated that 26.0% earns less than ₦30,000, 21.9% earns ₦30,000-₦34,000, 19.5% earns ₦35,000-₦39,000, 15.1% earns ₦40,000-₦44,000, and 17.4% earns ₦45,000 and above as monthly incomes.

Table 2. Percentage Distribution of Respondents on Maternal Death Situation in Dekina Local Government Area.

Variables	Category	Frequency (384)	Percentage (%)
Maternal Health Situation in Dekina LGA:	High	Moderate	Low
	306	55	23
	(79.7%)	(14.3%)	(6.0%)
			Total
			384
			100

Source: Field Survey, 2024

Table 2 above indicated that majority (79.7%) of the respondents rated maternal death situation in Dekina Local Government Area to be high, 14.3% of them rated it to be moderate, while, only few (6.0%) rated it to be low.

An interviewee in her response stated that:

The rate of deaths among women here in Emewe especially during delivery is high. Only God can help as some of us are scared of getting pregnant (IDI/Female Respondents in Emewe/July 13th/2024).

Another interviewee also reported that:

Maternal death situation in this community is one of the worst you can get in the world. Many women regularly lost their lives, sometimes including the lives of their babies dur-

ing pregnancy and labour. It is indeed pathetic situation (IDI/Female Respondents in Oganenigu/July 19th/2024).

Again, another interviewee in Ojikpadala stated that:

The maternal death here is threatening, sometimes, within three to four mothers can die out of ten that are pregnant. Our condition can only change if we have good hospitals and government attention (IDI/Female Respondents in Ojikpadala/July 16th/2024).

However, an interviewee in Odu I stated that:

Although women dies during pregnancy and child labour but it is not that pronounced in this community. We easily rush to Anyigba or the little available healthcare centres here (IDI/Female Respondents in Odu I/July 23rd/2024).

Table 3. Percentage Distribution of Respondents on Socio-Demographic Determinants of Maternal Death in Dekina Local Government Area.

Variables	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree	Total
Maternal Age:	116 (30.2%)	111 (29.0%)	26 (6.8%)	22 (5.7%)	19 (4.9%)	384 (100%)
Marital Status	246 (64.1%)	82 (21.4%)	31 (8.1%)	7 (1.8%)	18 (4.7%)	384 (100%)
Religious Belief:	181 (47.1%)	193 (50.2%)	9 (2.3%)	0 (0.0%)	1 (0.3%)	384 (100%)
Employment Status:	211 (54.9%)	146 (38.0%)	11 (2.9%)	7 (1.8%)	9 (2.3%)	384 (100%)
Income Level:	255 (66.4%)	114 (29.7%)	4 (1.0%)	2 (0.5%)	9 (2.3%)	384 (100%)
Occupation:	188 (49.0%)	135 (35.2%)	22 (5.7%)	18 (4.7%)	21 (5.5%)	384 (100%)
Parity:	233 (60.7%)	112 (29.2%)	20 (5.2%)	15 (3.9%)	4 (1.0%)	384 (100%)

Variables	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree	Total
Cultural Belief:	226 (58.6%)	131 (34.1)	7 (1.8%)	11 (2.9%)	9 (2.3%)	384 (100%)
Education Qualification:	279 (72.7%)	101 (26.3%)	1 (0.3%)	2 (0.5%)	1 (0.3%)	384 (100%)
Place of Residence/Geographical Location:	326 (84.9%)	58 (15.1%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	384 (100%)
Healthcare accessibility:	225 (58.6%)	135 (35.2%)	3 (0.8%)	16 (4.2%)	5 (1.3%)	384 (100%)

Source: Field Survey, 2024

As revealed in [table 3](#) above, majority (30.2%) of the respondents strongly agreed that maternal age determine maternal death, 29.0% agreed, 6.8% did not decide, 5.7% disagreed, and 4.9% disagreed strongly. Also, majority (64.1%) of them strongly agreed that marital status determine maternal death, while 21.4% agreed, 8.1% did not decide, 1.8% disagreed, and 4.7% disagreed strongly. Again, 47.1% representing the majority of the respondents strongly agreed that religious belief determine maternal death, 50.2% agreed, 2.3% did not decide, none disagreed, but 0.3% strongly disagreed.

Furthermore, the table revealed that majority (54.9%) of the respondents strongly agreed that employment status determine maternal death, 38.0% agreed, 2.9% did not decide, 1.8% disagreed, and 2.3% disagreed strongly. Again, majority (66.4%) of the respondents strongly agreed that income level determines maternal death, 29.7% agreed, 1.0% did not decide, 0.5% disagreed, and 2.3% disagreed strongly. 49.0% strongly agreed that occupation determines maternal death, 35.2% agreed, 5.7% did not decide, 4.7% disagreed, and 5.5% disagreed strongly. 60.7% strongly agreed that parity determines maternal death, 29.2% agreed, 5.2% did not decide, 3.9% disagreed, and 1.0% disagreed strongly.

Finally, the table revealed that majority (58.6%) of the respondents strongly agreed that cultural belief determine maternal death, 34.1% agreed, 1.8% did not decide, 2.9% disagreed, and 2.3% disagreed strongly. 72.7 strongly agreed that educational qualification determine maternal death, 26.3% agreed, 0.3% did not decide, 0.5% disagreed, and 0.3% disagreed strongly. 84.9% strongly agreed that place of residence/geographical location determines maternal death, 15.1% agreed, none were undecided, none disagreed, and none disagreed strongly. And 58.6% strongly agreed that healthcare accessibility determines maternal death, 35.2% agreed, 0.8% did not decide, 4.2% disagreed, and 1.3% disagreed strongly.

In line with the quantitative findings on the socio-demographic determinants of maternal death in Dekina Local Government Area, an interviewee revealed that:

Some of the factors causing maternal death in Dekina Local Government Area are the rate at which little girls gets pregnant these days, many without a husband and some rush to marry earlier than expected and that put them in danger. And when they die automatically a mother has died during pregnancy of labour. Lack of family planning also contributes a lot as mothers give birth without caution probably because of their religious belief. However, this is due to their level of education and awareness of the impending danger (IDI/Female Respondents in Odu I/July 23rd /2024).

Another interviewee pointed that:

Some of the reasons for maternal death in the area include; idleness. So they have sex to keep body and soul together not minding the danger of uncontrolled childbirth (IDI/Female Respondents in Ojikpadala/July 16th /2024).

In similar position, another interviewee presented that:

Some of the reasons such as cultural bondage and unavailability of healthcare services, or trained health workers, drugs or/and other important requirements causes maternal deaths in this area (IDI/Female university graduate in Emewe/July 13th /2024).

Also, interviewee supportively stated that:

Poor household income and geographical location are the major reasons for maternal health situation in the area. She said that, many women carter for their family need and that alone further impoverished the already poor women in the area. She also lamented that geographical location and distance of from satellite towns causes poor maternal deaths among women in the area (IDI/Female resident in Ogan-enigu/July 19th /2024).

Table 4. Percentage Distribution of Respondents on Measures for Reducing Maternal Death in Dekina Local Government Area.

Variables	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree	Total
Improving access to skilled birth attendants:	261 (68.0%)	91 (23.7%)	2 (0.5%)	18 (4.7%)	12 (3.1%)	384 (100%)

Variables	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree	Total
Improving community education/awareness:	214 (55.7%)	165 (43.0%)	3 (0.8%)	2 (0.5%)	0 (0.0%)	384 (100%)
Improving antenatal and post-natal care:	206 (53.6%)	152 (39.6%)	20 (5.2%)	2 (0.5%)	4 (1.0%)	384 (100%)
Family planning and child spacing:	198 (51.6%)	175 (45.6%)	8 (2.1%)	0 (0.0%)	3 (0.8%)	384 (100%)
Capacity building for healthcare workers:	252 (65.6%)	129 (33.6%)	0 (0.0%)	2 (0.5%)	1 (0.3%)	384 (100%)
Improving healthcare infrastructure:	266 (69.3%)	113 (29.4%)	5 (1.3%)	0 (0.0%)	0 (0.0%)	384 (100%)
Improving nutrition and anemia:	324 (84.4%)	55 (14.3%)	2 (0.5%)	3 (0.8%)	0 (0.0%)	384 (100%)
Tackling of gender inequality:	264 (68.8%)	111 (28.9%)	8 (2.1%)	0 (0.0%)	1 (0.3%)	384 (100%)
Addressing socio-cultural barriers:	246 (64.1%)	129 (33.6%)	5 (1.3%)	0 (0.0%)	0 (0.0%)	384 (100%)

Source: Field Survey, 2024

It is revealed in [table 4](#) above that 68.0% of the respondents strongly agreed that improving access to skilled birth attendants reduces maternal death in Dekina Local Government Area, 23.7% agreed, 0.5% were undecided, 4.7% disagreed, and 3.1% strongly disagreed. 55.7% strongly agreed that improving community education/awareness reduces maternal death, 43.0% agreed, 0.8% were undecided, 0.5% disagreed, and none strongly disagreed. 53.6% strongly agreed that improving antenatal and post-natal care reduces maternal death, 39.6% agreed, 5.2% were undecided, 0.5% disagreed, and 1.0% strongly disagreed. 51.6% strongly agreed that family planning and child spacing reduces maternal death, 45.6% agreed, 2.1% were undecided, none disagreed, but 0.8% strongly disagreed. 65.6% strongly agreed that capacity building for healthcare workers reduces maternal death, 33.6% agreed, none were undecided, 0.5% disagreed, and 0.3% strongly disagreed.

In addition, the study revealed that 69.3% of the respondents strongly agreed that improving healthcare infrastructure reduces maternal death, 14.3% agreed, 0.5% were undecided, none disagreed, and none strongly disagreed. 84.4% strongly agreed that improving nutrition and anemia reduces maternal death, 23.7% agreed, 0.5% were undecided, 0.8% disagreed, and none disagreed strongly. 68.8% strongly agreed that tackling gender inequality reduces maternal death, 28.9% agreed, 2.1% were undecided, none disagreed, but 0.3% strongly disagreed, and 64.1% strongly agreed that addressing socio-cultural barriers reduces maternal death, 33.6% agreed, 1.3% were undecided, none disagreed, and none strongly disagreed.

According to one of the interviewee in one of the four chosen area:

We are confident that having more availability and access to birth attendant, improving healthcare infrastructure, and improving prenatal and postnatal cares will increase maternal

healthcare service patronage of mothers here and that will also reduce maternal death (IDI/Female resident in Oganenigu/July 19th/2024).

Another interviewee presented that:

We are optimistic that the provision of education/awareness in our communities, improved family planning services, stable economy is capable of reducing hunger in the land, and tackling the age-long gender issue in the Local Government Area will help in reducing maternal death (IDI/Female Respondents in Odu I/July 23rd/2024).

In a similar view, two female interviewees interviewed separately in Emewe and Ojikpadala coincidentally state that:

Many solutions to reduce the death of mothers during pregnancy/childbirth can be advanced, but if the socio-cultural issues, tackling of gender discrimination and adequate training of the few people who understands little on maternal health can reduce maternal deaths in the area (IDI/Female university graduate in Emewe/July 13th/2024).

7. Discussion of Findings

The study was conducted among three hundred and eighty-four respondents in Dekina Local Government Area in Kogi Eastern Senatorial area. From the findings of the study; only female (women of reproductive age, 15-49 years) majorly within the ages of 15-19 and others within the age of 20-24 years, 25-29 years, 30-34 years, 35-39 years, and 40 years and above were the study's respondents. From this finding, women within the age of 15-49 years as the majority followed by those within the age of 20-24 implies that the study respondents were in their active reproductive age and that the hunch-back for the study. Majority of the respondents were Muslims, followed closely by Christians, and few African Traditional believers who were majority married women who are expected to have healthy maternal and childbirth

experiences, followed by single women expected to be married soon, and few separated, divorced, and widows.

Majority had primary education, followed by secondary and tertiary educations. Only few had non-formal education. This may be due to the availability of many primary and secondary schools and the establishment of the Prince Abubakar Audu University, Anyigba. Most of the respondents were Igalas followed by the Okun/Yoruba and the Ebiras. Although, with some good number of other tribes. This no doubt represents the three major ethnic groups in the state. In spite of their level of primary and secondary education with appreciable tertiary education, majority of them were into business/trading followed by unemployment among those willing to work, with only few engages as civil servants and in other activities, with the least of them in the private sectors. It was also found that majority of them earns less than ₦30,000 followed by those who earns ₦30,000-₦34,000, ₦35,000-₦39,000, ₦45,000 and above, and ₦40,000-₦44,000 as monthly incomes.

As to the maternal death situation in the study area, it was found that maternal death is high as indicated by the majority of the respondents in the study area. This finding is in tandem with that of [21] from developing world and African views, [4, 15, 3] from the Nigerian view. These studies indicated that maternal deaths in developing countries which include African countries with Nigeria inclusive are high.

On the socio-demographic determinants, the study found that maternal age, marital status, religious belief, employment status, income level, occupation, parity, cultural belief, educational qualification, place of residence/geographical location, and healthcare accessibility determines maternal death in Dekina Local Government Area. This agrees with the study carried out by [31, 19, 29, 8, 13, 5, 1, 10] who presented age of mothers, religious belief, income, occupation, education/awareness, parity, cultural beliefs, geographic location and many other socio-demographic factors as the reasons for maternal death across the globe, especially developing world.

Lastly, the study found that to improving access skilled to birth attendants, improving community education/awareness, improving antenatal and post-natal care, family planning and child spacing, capacity building for healthcare workers, improving healthcare infrastructure, improving nutrition and anemia, tackling gender inequality, and addressing socio-cultural barriers reduces maternal death in Dekina Local Government Area. This finding agrees with the findings of [20] and [14] which found that competent treatments, development of public policies, allocation of necessary resources, strengthening of citizen participation and accountability, improving the quality of maternal and sexual and reproductive health care, investing in the health workforce, identification of barriers, ensuring universal access to contraceptive methods, and address of sexual and reproductive health needs as some of the measures for lowering maternal death.

8. Recommendations

Based on the above findings, the study recommended the followings:

1. That intensive education/awareness campaign against high mortality in the study area should be launched by the governmental at all levels as well as Non-Governmental Organizations and other concern bodies that deal with maternal health related issues.
2. The study also recommended the sensitization of female adolescents on the age requirement before sexual behavior. That is, parents should enlighten the daughter and wards on the danger of becoming pregnant at a tender age.
3. Again, the study recommended the participation of stakeholders such as the religious and cultural leaders on issues relating to maternal health and mortality.
4. Furthermore, availability of adequate healthcare centres and health workers for recommended especially in semi-urban and rural areas to reduce maternal and child deaths.
5. Finally, the study recommended that government, NGO's and well-to-do individuals should invest in semi-rural and rural areas to boost the economic activities of the people which will in turn reduce poverty among the people. This will again provide job opportunity for the women in the area.

Abbreviations

ATR	African Traditional Religion
GTR	Grupo de Trabajo Regional
IDI	In-depth Interview
MDGs	Millennium Development Goals
N.D	No Date
NGOs	Non-governmental Organizations
NHP	National Health Policy
PHC	Primary Health Care
SDGs	Sustainable Development Goals
SMI	Safe Motherhood Initiative
SPSS	Statistical Package for Social Sciences
UNFPA	United Nations Population Fund
UNICEF	United Nations Children's Fund
WHO	World Health Organization
3DM	Three Delay Model

Author Contributions

All authors played an active role in this study, contributing to the development of the study's concept and design, the analysis and interpretation of data, and the revision of the manuscript for its intellectual content. They also provided final approval for the version to be published and take full responsibility for every aspect of the study.

Conflicts of Interest

The authors declare no conflicts of interest.

References

- [1] Adedini, S. A., Odimegwu, C., Imasiku, E. N. S., Ononokpono, D. N., & Ibisomi, L. (2015). Regional variations in infant and child mortality in Nigeria: a multilevel analysis. *Journal of Biosocial Science*, 47(2): 165-187.
- [2] Adenyuma, M. O. & Mundi, R. (2021). An assessment of the socio-demographic factors influencing maternal healthcare in Kogi state. *Science World Journal*, 15(4): 2020.
- [3] Ahuru, R. A. (2020). Maternal care utilization in primary healthcare centers in Nigerian communities. *International Quarterly of Community Health Education*, 0(0): 1-12.
- [4] Berelie, Y., Yeshiwas, D., Yismaw, L., & Alene, M. (2020). Determinants of institutional delivery service utilization in Ethiopia: a population based cross sectional study. *BioMedCal Public Health*, 1-10.
- [5] Black, R. E., Victora, C. G., Walker, S. P., Bhutta, Z. A., Christian, P., de Onis, M., & Martorell, R. (2013). Maternal and child undernutrition and overweight in low-income and middle-income countries. *The Lancet*, 382(9890): 427-451.
- [6] Bohren, M. A., Hunter, E. C., Munthe-Kaas, H. M., Souza, J. P., Vogel, J. P., & Gülmezoglu, A. M. (2015). Facilitators and barriers to facility-based delivery in low-and middle-income countries: A qualitative evidence synthesis. *Reproductive Health*, 12(1), 67. <https://doi.org/10.1186/s12978-015-0042-2>
- [7] City Population Projection (2022). *Dekina Local Government Area in Nigeria*. https://www.citypopulation.de/en/nigeria/admin/kogi/NGA023005_dekina/
- [8] Doctor, H. V., Findley, S. E., Ager, A., Cometto, G., Afenyadu, G. Y., & Adamu, F. (2012). Using community-based research to shape the design and delivery of maternal health services in Northern Nigeria. *Reproductive Health Matters*, 20(39): 104-112.
- [9] Essendi, H., Mills, S., & Fotso, J. C. (2011). Barriers to formal emergency obstetric care services' utilization. *Journal of Urban Health*, 88(Suppl 2): 356-S369. <https://doi.org/10.1007/s11524-010-9481-1>
- [10] Fapohunda, B. M., & Orobato, N. G. (2013). When women deliver with no one present in Nigeria: Who, what, where, and so what?. *PloS One*, 8(7), e69569.
- [11] Figueiredo, E. R. L., Miranda, C. S. C., Campos, A. C. V., Gomes, F. C., Rodrigues, C. N. C., & Melo-Neto, J. S. (2024). Influence of sociodemographic and obstetric factors on maternal mortality in Brazil from 2011 to 2021. *BioMedCal Women's Health*, 24: 84.
- [12] Gabrysch, S., & Campbell, O. M. (2009). Still too far to walk: Literature review of the determinants of delivery service use. *BioMed Central Pregnancy and Childbirth*, 9(34). <https://doi.org/10.1186/1471-2393-9-34>
- [13] Gakidou, E., Cowling, K., Lozano, R., & Murray, C. J. (2010). Increased educational attainment and its effect on child mortality in 175 countries between 1970 and 2009: a systematic analysis. *The Lancet*, 376(9745), 959-974.
- [14] Grupo de Trabajo Regionale (Regional Task Force for the Reduction of Maternal Mortality) (n.d). *Nine steps to reduce maternal mortality: Zero maternal deaths/prevent the preventable*: 1-16. www.everywomaneverychild-lac.org
- [15] Ige, R. O., Ilori, O. R., Akande, R. O., Abodunrin, O. L., Bamidele, J. O., & Bada, O. B. (2023). Socio-demographic determinants of maternal and child health service utilization among mothers in Oyo state. *Integrated Journal of Medical and Medical Science*, 3(2): 1-10.
- [16] Koblinsky, M., Moyer, C. A., Calvert, C., Campbell, J., Campbell, O. M., Feigl, A. B., Graham, W. J., Hatt, L., Hodgins, S., Matthews, Z., McDougall, L., Moran, A. C., Nandakumar, A. K., & Langer, A. (2016) Quality maternity care for every woman, everywhere: a call to action. *Lancet*, 388(10057): 2307-2320.
- [17] Montgomery, A. L., Ram, U., Kumar, R., Jha, P., & Million Death Study Collaborators. (2014). Maternal mortality in India: Causes and healthcare service use based on a nationally representative survey. *PLOS ONE*, 9(1), e83331. <https://doi.org/10.1371/journal.pone.0083331>
- [18] Moyer, C. A., & Mustafa, A. (2013). Drivers and deterrents of facility delivery in sub-Saharan Africa: A systematic review. *Reproductive Health*, 10(1), 40. <https://doi.org/10.1186/1742-4755-10-40>
- [19] Nove, A., Matthews, Z., Neal, S., & Camacho, A. V. (2014). Maternal mortality in adolescents compared with women of other ages: evidence from 144 countries. *The Lancet Global Health*, 2(3), e155-e164.
- [20] Nyflot, L., & Sitras, V. (2018). Strategies to reduce global maternal mortality. *Nordic Federation of Societies of Obstetrics and Gynecology*, 97(2018): 639-640.
- [21] Okpala, P. U., Okoye, C. L., Adeyemo, F. O., Iheanacho, P. N., Emesonwu, A. C., Osuala, E. O., Okpala, I. G. (2019). Utilization of maternal and child health services in Enugu, South East, Nigeria. *International Journal of Community Medicine and Public Health*, 6(8): 1-6.
- [22] Oladipo, I. A., & Akinwaare, M. O. (2023). Trends and patterns of maternal deaths from 2015 to 2019, associated factors and pregnancy outcomes in rural Lagos, Nigeria: a cross-sectional study. *Pan African Medical Journal*, 44(185): 1-13. <https://doi.org/10.11604/pamj.2023.44.185.37567>
- [23] Olamijulo, J. A., Olorunfemi, G., & Okunola, H. (2022). Trends and causes of maternal death at the Lagos University teaching hospital, Lagos, Nigeria (2007-2019). *BioMed Central Pregnancy and Childbirth*, 22(360): 1-12. <https://doi.org/10.1186/s12884-022-04649-4>
- [24] Onah, H. E., Ikeako, L. C., & Iloabachie, G. C. (2006). Factors associated with the use of maternity services in Enugu, southeastern Nigeria. *Social Science & Medicine*, 63(7): 1870-1878. <https://doi.org/10.1016/j.socscimed.2006.04.019>

- [25] Pacagnella, R. C., Cecatti, J. G., Parpinelli, M. A., Sousa, M. H., Haddad, S. M., Costa, M. L., & Pattinson, R. C. (2014). Delays in receiving obstetric care and poor maternal outcomes: Results from a national multicenter cross-sectional study. *BioMed Central Pregnancy and Childbirth*, 14(1): 159. <https://doi.org/10.1186/1471-2393-14-159>
- [26] Riese, S., & Rabina, D. (2023). *Understanding the three delays among postpartum women in Nepal*. Demographic and Health Survey (DHS) further Analysis Report, No. 144. Rockville, Maryland, USA: ICF.
- [27] Shah, B., Krishnan, N., Kodish, S. R., Yenokyan, G., Fatema, K., Uddin, K. B., Rahman, A. K. M. F., & Razzak, J. (2020). Applying the three delays model to understand emergency care seeking and delivery in rural Bangladesh: a qualitative study. *BioMedical Journal Open*, 1-7. <https://doi.org/10.1136/bmjopen-2020-042690>
- [28] Somade, E. C., & Abaribe, C. E. (2020). Awareness of and barriers to maternal health care services in Ogun State, Nigeria. *Commonwealth Journal of Academic Research*, 1(8): 1-9.
- [29] Tunçalp, Ö, Were, W. M., MacLennan, C., Oladapo, O. T., Gülmezoglu, A. M., Bahl, R., Daelmans, B., Mathai, M., Say, L., Kristensen, F., Temmerman, M., Bustreo, F. (2015). Quality of care for pregnant women and newborns-the WHO vision. *British Journal of Obstetrics and Gynaecology*, 122(8): 1045-9.
- [30] United Nations (UN) (2015). *Transforming our world: The 2030 Agenda for Sustainable Development*. New York: United Nations.
- [31] Vousden, N., Bunch, K., Kenyon, S., Kurinczuk, J. J., & Knight, M. (2024). Impact of maternal risk factors on ethnic disparities in maternal mortality: a national population-based cohort study. *The Lancet Regional Health-Europe*, 40: 100893.
- [32] World Health Organization (WHO). (2023). *Trends in Maternal Mortality 2000 to 2020: Estimates by WHO, UNICEF, UNFPA, World Bank Group and the United Nations Population Division*. Geneva: World Health Organization.