HUMANUS DISCOURSE Vol. 4. NO 2. 2024
ISSN 2787-0308 (ONLINE)

Maternal mortality among women in rural communities in Nasarawa State, Nigeria: A study of the risk factors

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Abstract

Maternal mortality is very high in many parts of the developing world, especially in sub-Saharan Africa. The study examined maternal mortality among women in rural communities of Nasarawa State, Nigeria: a study of the risk factors. The study utilized the Health Belief Model to explain the risk factors associated with maternal mortality among women in rural communities of Nasarawa State, Nigeria.A sample of 575 respondents was drawn, using multi-stage sampling techniques including simple random, systematic sampling, clustered and purposive sampling techniques in the selection of Local Government Areas, Electoral wards, villages/communities, houses, households and individuals/women of childbearing age. The results show that prevalence of maternal mortality is fairly frequent and significant with 49.6 percent of the total respondents and nutritional level, level of educational attainment and utilization of maternal healthcare services are the most probably risk factors associated with maternal mortality among women in rural communities of Nasarawa State, Nigeria. Furthermore, the study also indicates that, there has been an increase in the level of awareness of the risk factors associated with maternal mortality as established by 71.3 percent of the study population which significant and in a positive direction. It is based on this that the study recommends that there is need for interventions such as health education and community mobilization that aims to educate rural women on risk factors and danger signs associated with poor maternal health outcomes and entrenchment of social security for pregnant women especially rural women is quite essential for the improvement in maternal healthcare. Similarly, rural women's socio-economic standing must be improved by workable policies that are aimed at improving their chances in the socio-economic ladder in order for them to fully maximize the opportunities inherent in the utilization of health care services.

Keywords: Mortality, Maternal Mortality, Women, Rural Communities, Risk Factors

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ISSN 2787-0308 (ONLINE)

Introduction

Maternal mortality has been on the increase in recent times with detrimental effects on the socio-economic development of many nations[1]. Approximately 830 women die globally every day from preventable causes related to pregnancy and childbirth. More worrisome is the fact that 99% of all maternal deaths occur in developing countries[2]. It mainly occurs in resource-limited settings from preventable causes and affects women of childbearing age (15-49 years of age) with poorly met health needs[3]. Maternal mortality is unevenly spread geographically with marked differences between developed and developing countries. Developing nations bear the brunt (99%) of maternal deaths, with over 50% occurring in sub-Saharan Africa[4]. From 1990 to 2015, the global maternal mortality ratio declined by 44 per cent; from 385 deaths to 216 deaths per 100,000 live births. This translates into an average annual reduction rate of 2.3 per cent. While this looks impressive, it is less than half of the 5.5 per cent annual rate required to achieve the three-quarters reduction in maternal mortality target for 2015 in the rested Millennium Development Goal five and nowhere close to the goal three (3) of the Sustainable Development Goals targeted at reducing the global maternal mortality ratio to less than 70 per 100,000 live births[5].

Almost all maternal deaths can be prevented, as evidenced by the vast disparities found between the richest and poorest countries. The lifetime risk of maternal death in high-income countries is 1 in 3,300, compared to 1 in 41 in low-income countries[6]. The number of women and girls in the world who die each year from complications of pregnancy and childbirth declined from 532,000 in 1990 to 303,000 in 2015[7]. According to current world statistics, over 800 women die each day from complications in pregnancy and childbirth; and for every woman who dies, approximately 20 others suffer serious injuries, infections, or disabilities[8].

In Africa, Nigeria stands out as one of the most populous countries globally, boasting a population exceeding 210 million. Alarmingly, Nigeria contributes 20% of all global maternal deaths, characterized by a staggering maternal mortality ratio of 800 maternal deaths per 100,000 live births, a figure starkly contrasting with that of most advanced countries. Women in Nigeria face a risk 500 times higher of losing their lives during childbirth compared to women in advanced nation[9]. Despite efforts to curb maternal mortality, Nigeria still grapples with shockingly high rates of maternal death and pregnancy-related

[1] World Health Organization. (2021). Maternal mortality.
[2] World Health Organization. (2021). Maternal mortality: Key facts
[3] World Health Organization. (2021). Maternal mortality: Who is at risk?
[4] World Health Organization. (2021). Maternal mortality: Key facts
[5] World Health Organization. (2021). Maternal mortality: Fact sheets.
[6] African Population and Health Research Center. (2017). Maternal health in Africa: Progress, challenges, and opportunities
[7] World Health Organization. (2021). Maternal mortality: Data and statistics.
[8] World Health Organization. (2021). Maternal mortality: Fact sheets
[9] USAID. (2019). Maternal mortality rate in Nigeria

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ISSN 2787-0308 (ONLINE)

complications. Annually, an estimated 1-1.6 million women suffer severe disabilities from pregnancy and birth-related causes[10], exacerbating the socio-economic challenges and impeding progress toward achieving the Sustainable Development Goals (SDGs).

Nigeria's maternal mortality rate stands at 576 per 100,000 births, a deeply troubling statistic where virtually every childbirth carries the risk of complications. Regional disparities within Nigeria further compound this issue, with the Northern region exhibiting alarmingly high maternal mortality rates of up to 1,549 per 100,000 live births, while the Southwestern region reports a comparatively lower rate of 165 per 100,000 live births[11]. Additionally, a rural-urban divide is evident, with urban areas reporting a maternal mortality rate of 351 per 100,000 live births, contrasting sharply with the rate of 828 per 100,000 live births in rural areas[9]. These discrepancies can be attributed to factors such as high fertility rates coupled with limited access to contraceptives, compounded by socio-cultural complexities prevalent in Nigeria, where fertility behaviors align with ethnic and regional patterns, consequently influencing mortality rates.

Furthermore, inadequate access to medical services and underutilization of healthcare services contribute significantly to high maternal mortality rates in various regions[12]. Nigeria's maternal healthcare system is characterized by a blend of traditional, faith-based, and orthodox healthcare providers. The coexistence of traditional and faith-based healthcare practices alongside socio-economic, environmental, and cultural determinants significantly influences the efficacy of the healthcare system. This influence is evident in cases where pregnancies are managed using non-orthodox methods, leading to challenges in recognizing danger signs during pregnancy and subsequent high maternal mortality rates[13].

There are other known factors aside from medical conditions that may be responsible for maternal mortality in Nigeria. These factors include, but are not limited to, social, economic, environmental, and cultural factors, which directly influence maternal mortality rates. Maternal mortality in most rural areas in Nigeria is thus caused by other precipitating factors that are non-medical. These factors range from poverty, age at marriage, low levels of education or absence of it, prohibited food, low purchasing power, and certain harmful cultural beliefs and practices that encourage a high percentage of women, especially in rural areas, to patronize faith clinics and traditional practitioners as alternative

[10] World Health Organization Factsheets. (2021). Maternal health statistics in Nigeria
[11] World Health Organization. (2021). Maternal mortality in Nigeria: Regional disparities
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[13] Rogo, K. O., Oucho, J., &Mwalali, P. (2016). Maternal health in Africa: Challenges, opportunities, and prospects.

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ISSN 2787-0308 (ONLINE)

healthcare options[14]. Apart from the problems posed by these factors, maternal health is also plagued with problems of poverty, illiteracy, lack of knowledge, delay in reaching health facilities either due to inaccessibility, poor roads, low communication networks, inadequate transportation systems, or long distances to be covered, as well as delays in receiving appropriate care at health facilities which are characterized by the absence of quality maternal health services, the inadequacy of skilled birth attendants, and inadequate medical supplies during labor, delivery, and after delivery. Thus, there is a need to focus on preventing maternal deaths in Nigeria by tackling these problems affecting the ability of pregnant women to access timely and quality maternal health services[15].

The present health situation in Nigeria is unsatisfactory, with women, particularly those in rural areas, being most affected. Maternal mortality rates in Nigeria are among the highest in the world despite numerous existing policies and programs aimed at improving maternal health. This is highlighted by the World Health Organization's 2017 Global Health Observatory, which ranked Nigeria's overall health system performance as 187th among the 190 Member States, a situation that has persisted since the 1990s[16] According to estimates by the World Health Organization (WHO), UNICEF, UNFPA, World Bank Group, and the United Nations Population Division, maternal deaths in Nigeria were estimated at 58,000, constituting 19 percent of the global estimate of 303,000 maternal deaths[17]. The Nigeria Demographic and Health Survey (NDHS) 2018 reported Nigeria's maternal mortality ratio as high as 512 per 100,000 live births. This means that, based on estimates from these agencies, the lifetime risk of maternal death in Nigeria is 1 in 22, a figure significantly higher than 1 in 4,900 for more developed countries, 1 in 150 for less developed countries, and 1 in 36 for the least developed countries in Sub-Saharan Africa[18] Most of these maternal deaths are caused by preventable conditions such as hemorrhage, eclampsia, unsafe abortion, obstructed labor, and malaria. Despite efforts, there has been insignificant reduction in maternal deaths in Nigeria, particularly in rural areas where over 53 percent of the population resides. Rural women are at a higher risk of deprived maternal health consequences in Nigeria. Their challenges are exacerbated by the urban bias in the location of health facilities, accessibility and utilization of maternal health care services, health beliefs, lifestyle decisions, and the availability of skilled human resources

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[18] Ajayi, A. I., Osakinle, D. C., &Osakinle, E. O. (2013). Attitude of women of reproductive age towards focused antenatal care in rural and urban health facilities in Nigeria

ISSN 2787-0308 (ONLINE)

for health. Only about 21% of rural women (compared to 29% in urban centers) have access to focused antenatal care[19]. In 2013, while 84% of urban women sought ANC, only 47% of rural women did so. Rural women have lower usage of modern contraceptives, with a higher incidence of abortion and severe complications from unsafe abortion than their urban counterparts. This situation is particularly pronounced among rural women in the Northern part of Nigeria and Nasarawa State in particular. Currently, Nasarawa State is one of the states with a high rate of maternal mortality in the North Central region and Nigeria at large. Statistics from the 2018 National Demographic and Health Survey indicate that the maternal mortality ratio in Nasarawa State has been estimated to be around 512 per 100,000 live births, which falls far short of the Sustainable Development Goals (SDGs) target of 70 per live birth[20]. Therefore, there is a need to investigate maternal mortality among women in rural communities of Nasarawa State, Nigeria: a study of the risk factors. It is against this backdrop that this study was conducted.

Statement of the Problem

The situation of maternal health in Nigeria remains one of the worst in Africa, as evidenced by prevailing maternal mortality ratios. Nigeria contributes significantly more than 19% of maternal deaths globally. This prevailing problem in Nigeria is strongly linked to the weak implementation of maternal health policies and services, as well as the presence of several cultural, socio-economic, and environmental factors. Additionally, Nigeria's maternal health care system is characterized by a mix of traditional, faith-based, and orthodox healthcare providers. The situation is particularly severe in rural areas in Nigeria where the healthcare system is inadequate, poor, and overstretched. Moreover, the poverty level is high, with 63 percent of deliveries taking place at home, and only a small percentage (38%) of women being attended to at delivery by a trained attendant[21]. The Nigerian Federal Ministry of Health set the year 2006 as the target year to reduce maternal mortality by 50%. However, not only were these targets not achieved, but the maternal health situation in Nigeria is now much worse than in previous years. Past efforts to reduce maternal mortality ratio in Nigeria focused on making direct improvements to the health system, but these efforts did not allocate sufficient resources to successfully reduce maternal mortality in the country.

Nasarawa State is an agrarian state with a high percentage of rural dwellers. The state has a population of over 3 million people, including 1.6 million women of childbearing age[22].However, the maternal mortality ratio in Nasarawa State is 512 per 100,000 live births, as only one in three births in the State is attended by skilled health personnel. Women in rural areas contribute more to this

[19] World Health Organization. (2021). Maternal mortality: Fact sheets.

[20] National Bureau of Statistics. (2021). Nigeria demographic and health survey.

[21] National Bureau of Statistics. (2022). Population and housing census.

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number as they are less advantaged compared to women in urban areas in terms of maternal health services, including family planning services. Maternal mortality in the State is a serious health problem. In the State, most rural women are challenged with the predicament of accessing and utilizing maternal health care services. This is because they are faced with the problems of low income and education, unavailability of health care services, and poor road networks. Often, women living in rural areas have little or no source of income or education to cater for their health needs. They are at the disadvantaged part of society. Besides, women from disadvantaged segments of society are in double jeopardy since they find themselves even more disadvantaged within a disadvantaged population – they are the poorest among the poor and the least educated among the inadequately educated. Women with low incomes are economically disadvantaged and are unable to use modern contraception, attend four or more antenatal care, deliver with the help of a skilled attendant, or even afford the cost of cesarean surgery when the need arises.

Several studies in Nigeria (Ogu & Ephrain, 2018; Oladineji et al., 2013; Okeke et al., 2016; Aboyeji et al., 2014; Agan et al., 2018; Awoyesuku et al., 2018; Usman et al., 2019; Akokuwebe & Okafor, 2015) have been undertaken on maternal mortality, but very few have explored risk factors associated with maternal mortality among women in rural communities of Nigeria where maternal mortality rates remain increasingly higher. Available studies have concentrated on urban and rural women in the Western and Eastern parts of Nigeria; very few have focused on the North Central region of Nigeria and Nasarawa State in particular. Consequently, little is known about the risk factors associated with maternal mortality among rural women in this part of the country. This has given rise to not just context-specific gaps in literature on maternal mortality among women in rural communities of Nasarawa State-Nigeria, but also in knowledge related to the risk factors associated with maternal mortality among women in rural communities of Nasarawa State, Nigeria, a larger percent of whom are of childbearing age. Therefore, it has become imperative to study the risk factors associated with maternal mortality among women in rural communities of Nasarawa State, Nigeria.

Theoretical considerations

Mortality

Like other societal issues, scholars or intellectuals have varied views on mortality. In other words, there is no consensus or generally accepted definition of the concept. However, this study focuses on those definitions that are widely accepted. Mortality is the pattern of death in a population. It refers to the occurrence of deaths within a population at a given point in time. Mortality encompasses deaths that occur within a population, and the incidence of death can reveal much about a population's standard of living and healthcare delivery services in a country[23]. Generally, the mortality rate is obtained by first

[23] World Health Organization. (2014). Trends in maternal mortality: 2000 to 2017.

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understanding the crude deaths. The World Health Organization (2019) defines mortality as the demographic event of death.

Death is a natural phenomenon that occurs just once for each individual, making its analysis simpler compared to the study of fertility, where the event of birth can occur with different incidences among women. According to Graunt (1662), mortality refers to the relative frequency of death in a population. Demographers use two different concepts when referring to mortality: the lifespan, which is the numerical age limit of human life, and life expectancy or expectation, which is the average expected number of years of life to be lived by a particular population at a given time. In the context of this study, mortality means deaths that occur among women in rural communities of Nasarawa State.

Maternal Mortality

It is rather difficult to point out a single holistic definition of maternal mortality despite its significance and wide usage in the field of demographic and population studies. This has led scholars, researchers, intellectuals, and authors to define maternal mortality from different perspectives and perceptions. The World Health Organization refers to maternal mortality as the death of a woman while pregnant or within forty-two days after termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes. Maternal death is also defined as the death of a woman from direct or indirect obstetric causes occurring more than 42 days but less than one year after the termination of the pregnancy[24]. Similarly, Ibrahim (2016) asserts that maternal mortality refers to any loss of a woman's life resulting from pregnancy complications or death within 42 days after childbirth, regardless of the period or site of the pregnancy, arising from issues that are linked or escalated by the management of the pregnancy but not from accidents or incidental factors. Maternal mortality refers to deaths due to complications from pregnancy or childbirth. Within the context of this study, maternal mortality denotes the death of rural women or mothers in Nasarawa State while pregnant or within forty-two days after termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes. It also refers to the death of rural women or mothers in Nasarawa State from direct or indirect obstetric causes occurring more than 42 days but less than one year after the termination of the pregnancy[25].

Theoretical Framework

This study is situated within the framework of the Health Belief Model (HBM). The Health Belief Model is a psychological model that attempts to explain and predict health behaviors by focusing on the attitudes and beliefs of individuals.

[24] Rosenstock, I. M. (1974). Historical origins of the Health Belief Model. Health Education Monographs, 2(4), 328-335.
[25] Ibid, 328-335

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Developed in the 1950s by Social Psychologists Hochbaum, Rosenstock, and Kegels working in the USA public Health Services, this theory explains psychological health behavior change, particularly regarding the uptake of health services. The Health Belief Model suggests that people's beliefs about health problems, perceived benefits of action and barriers to action, and self-efficacy explain engagement (or lack of engagement) in health-promoting behavior. A stimulus, or cue to action, must also be presented to trigger the health-promoting behavior[26]. The Health Belief Model attempts to predict health behavior through a variety of means, recognizing that health is influenced by behavior and behavior is modifiable. According to MacKian (2003), the process of health care seeking involves the identification of pathways to the formal health care system, often commencing with home care and traditional healers and extending to the formal system, with pathways differing according to the present condition.[27]

In a review of the Health Belief Model or theory, Chen[28] demonstrated that the decision to engage with a particular medical channel is influenced by a variety of variables, including sex, age, social status, type of complications, access to services, and perceived quality of service. Health-seeking behavior looks at illness behavior more generally and focuses particularly on motivating factors of illness perception and health belief. Studies on health care-seeking behavior look beyond the individual for social patterns or determinants of decision making. Health-seeking behavior varies for the same individuals or communities when faced with different illnesses.

The Health Belief Model is used to develop effective interventions to change pregnant women's health-related behaviors by targeting various aspects of the model's key constructs (susceptibility, severity, benefits, cue to action). Interventions based on the Health Belief Model may aim to increase perceived susceptibility and perceived seriousness of a health condition by providing education about the prevalence and incidence of complications, individualized estimates of risks, and information about the consequences of maternal mortality (e.g., medical, financial, and social consequences)[29] Interventions may also aim to alter the cost-benefit analysis of engaging in a health-promoting behavior when seeking health care by the women (i.e., increasing perceived benefits and decreasing perceived barriers) by providing information about the efficacy of various behaviors to reduce the risk of disease, identifying commonly perceived barriers towards health care, providing incentives to engage in health-promoting behaviors, and engaging social support or other resources to encourage health-promoting behaviors among the women.

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[26] Ibid, 328-335

[27] Chen, C. Y. (2012). *Cooking Frequency May Enhance Survival in Taiwanese Elderly.* Public Health Nutrition: p. 1-8.

[28] Ibid., p. 1-8.

[29] World Health Organization. (2000). Pregnancy, childbirth, postpartum and newborn care: A guide for essential practice. Retrieved from https://www.who.int/maternal_child_adolescent/documents/en/

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ISSN 2787-0308 (ONLINE)

Furthermore, interventions based on the Health Belief Model may provide cues to action to remind and encourage women to engage in health-promoting behaviors such as practicing healthy living during the period of pregnancy. Interventions may also aim to boost self-efficacy by providing training in specific health-promoting behaviors, particularly for complex lifestyle changes during childbearing (e.g, changing diet or physical activity, adhering to a complicated medication regimen). Interventions can be aimed at the individual level (i.e., working one-on-one with women to increase engagement in health-related behaviors) or the societal level (e.g., through legislation, changes to the physical environment).

The espousal of the Health Belief Model in this study is exacting outside the purview of health seeking given that pregnancy is not associated with illness. Conversely, its application here indicates its penetrating and multidimensional feature, principally for a discourse on risk factors associated with maternal mortality among rural women, which in themselves are generally heralded by some form of complications that translate to illness and illness behavior. Hypothesized on the basis of main constructs, the model is entrenched in the perception of the actors as the driver of health-seeking behavior. The model supposes that perceived susceptibility to maternal-related mortality would likely motivate a pregnant woman or her significant others to undertake maternal health services related to family planning, antenatal, delivery, postnatal, and beyond postnatal care with zeal. Such perception will engender early and sustained care-seeking in facilities with requisite competencies. This would not be the case for those who perceive pregnancy as a normal condition that does not require special care. The latter scenario may explain why some families allow expectant women to continue their laborious activities late into pregnancy, hardly get them registered early and/or in tested medical facilities, and do not support these women to improve their nutritional status[23].

Research shows that diets with sufficient calories and micronutrients are essential for pregnancies to be successfully carried to term. Poor nutrient intake is associated with anemia and serious maternal illness. Anemia among pregnant women may be a function of several factors such as nutritional ignorance, beliefs, practices, and poverty. Indeed, women represent a disproportionate share of the poor and are largely unable to independently provide themselves with necessary maternal requirements; a condition that has implications for their health status and pregnancy outcomes.

The model views perceived severity in relation to already established illness conditions, in this case, maternal complications. Customarily, the perception of the seriousness of a given maternal situation would not only make for recourse to early emergency obstetric care but also patronage of perceived adequate facilities. Yet, due to ignorance about symptoms of life-threatening conditions requiring urgent attention, some situations are never perceived as serious. As studies have indicated, maternal mortalities are strongly associated with delays

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ISSN 2787-0308 (ONLINE)

in seeking care, sub-standard health services, and lack of medical supplies at the time of labor, delivery, and immediately after birth[30].

Perceived benefits emphasize calculations, among potential actors, pertaining to the merits and costs of either taking or avoiding a specific health-related action within a given illness scenario. This construct assumes that individuals will take actions considered appropriate for handling threatening situations, in this case, maternal-related complications. The appropriateness of a given action will be to the extent that other alternatives are less desirable or even inimical to successful maternal outcomes; unnecessary delays in transferring emergency cases to medical facilities, patronizing inadequate facilities, and engaging in dangerous activities individually and collectively undermine the health status of expectant mothers.

The model conceives perceived barriers in terms of assumed and practical limitations to health seeking. For instance, an actor may conclude that some facility is inadequate to offer minimal obstetric care either due to the poor state of equipment or personnel bereft of current knowledge in medical practice or both. It could also be that treatment charges are exorbitant or that staff are rude and hardly consider the feelings of patrons. A study among the Ibani of River State, Nigeria found that the people avoided facilities that do not readily release placentas (afterbirth) to families for blessings and burial. These, among other reasons, may serve as disincentives for not patronizing a facility even if the latter is reputed for competence.

Methodology

This study was conducted in Nasarawa State, Nigeria. The key elements of this study consisted of all women of childbearing age, within the age bracket of 15 to 49 years and residents of the various communities or villages selected for the study. Additionally, the study population consisted of healthcare personnel (medical doctors, nurses, midwives, community health workers, and medical auxiliaries) working in healthcare facilities in Nasarawa State, Nigeria. Furthermore, traditional birth attendants, including village heads or community leaders, and officials of civil society organizations working on reproductive, maternal health, and related issues also constituted the population of this study. The population of this category of people from the selected Local Government Areas is 242,451.

The first step in the sampling process was the selection of the Local Government Areas where the study was conducted. Nasarawa State has a total of thirteen Local Government Areas spread across the three senatorial districts of the state. From each of these three senatorial districts, two Local Government Areas were selected for the study. The rationale for selecting the study Local

[30] Nwokocha, E. E., Obono, O. B., &Adedimeji, A. A. (2007). Health-seeking behavior among Ibanis of Rivers State, Nigeria. African Journal of Reproductive Health, 11(3), 84-92.

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Government Areas across the three senatorial districts was to ensure that respondents across different ethnic and socio-cultural groups are reflected in the sample. To select the Local Government Areas where the study was conducted, the names of the Local Government Areas in each of the three senatorial districts were written on pieces of papers of the same size. The pieces of paper for each of the three senatorial districts were shuffled. The researcher then selected two pieces of paper from the pile in each of the three senatorial districts. Through this method, Akwanga and Nasarawa Eggon were selected in the northern senatorial districts, while Keana and Awe were chosen from the southern senatorial district. From the western senatorial district, the Local Government Areas selected are Kokona and Nasarawa Local Government Areas.

To identify electoral wards with health facilities, a comprehensive list of health facilities in the state was obtained from the State Ministry of Health in Lafia, the state capital. Using this list, the wards with public or private health facilities or both were identified and shortlisted. Using the simple random sampling described above, the desired number of electoral wards were selected for the study. In each of the six selected Local Government Areas, two electoral wards with functional health care were picked for the study. At the end of the simple random exercise, Andaha and Ancho wards were selected from Akwanga Local Government Area, while Wakama-East and Lizzin-Keffi south were chosen from Nasarawa- Eggon Local Government Area. In Keana Local Government Area, the wards selected are Madaki and Kadarko-Arikpo and in Awe Local Government Area, Kanje/Ihuman and Abuni/Anukus wards were picked. Other wards selected for the study are Amba and Haderi from Kokona Local Government Area as well as Udege-Mbeki and Onda from Nasarawa Local Government Areas. Thus, a total of twelve electoral wards with health facilities were selected from the six selected LGAs.

The next task after the selection of the electoral wards, was the identification and selection of the villages where the study was conducted. On the basis of this consideration, only villages with either public or privately-owned health facility and those villages closely located to health facility were selected for the study.In addition, the population size of the villages with health care facilities was also considered in the selection process. The consideration of population size is based on the assumption that villages with large population provided the number of respondents required in each of the villages. Altogether a total number of twenty-four (24) villages, from the twelve (12) selected wards from the six (6) chosen Local Government Areas and respective senatorial district were picked for the study.

To select the respondents for the study, the researcher first obtained the population of the women of childbearing age in Nasarawa State, the six (6) selected Local Government Areas from the office of the National Bureau of Statistics (NBS) in Abuja. Having determine the size of the study population, the researcher used Krejcie and Morgan formula to determine the needed sample size for the study. After the computation it was established that 383 is what is the required sample size for a study population of 242,451. On the basis of the determined sample size of 383, the researcher decided to select an equal

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number of twenty-five (25) respondents from each of the twenty-four (24) selected villages. This was done to ensure equal representation of respondents from all the selected villages in the sample. To select this pre-determined number of respondents, the researcher visited all the selected villages. From the list of those who gave their consent to participate in the study, the researcher used the simple random sampling procedure to select twenty-five (25) respondent in each of the twenty-four (24) selected villages. All things considered, a total of six-hundred (600) women of child bearing age were selected for the study. Although the study needed a fairly large population of rural women of childbearing age, the sample size of six-hundred (600) was used in the study exceeds the three hundred and eighty-three (383) determined by Krejcie and Morgan formula, the researcher however decided to use a sizeable sample size because the use of a larger sample size according to Cochran, (1977) can lead to increase precision in the estimates and reduce the margin of error, making the results more reliable and robust, increases the representativeness and accuracy of the sample.

This study utilizes two method of data collection namely questionnaire and in-depth interview (IDI). Quantitative data were analyzed using univariate analysis on the Statistical Package for Social Science (SPSS v26). The univariate analysis involves the use of descriptive statistics, such as frequency distribution, mean, graphs and percentage. Likewise, the study employed thematic content analysis to analyze the qualitative data.

Discussion and Results

Table 1: Incidence of Maternal Mortality among Women in Rural Communities of Nasarawa State, Nigeria

Responses	Frequency	Percentage (%)
Very Frequent	129	22.4
Frequent	155	27.0
Not Frequent	291	50.6
Total	**575**	**100.0**

Source: Field Survey, 2023

Table 4.1 presents responses on the incidence of maternal mortality among women in rural communities of Nasarawa State, Nigeria. Data collected shows that the incidence of occurrence of maternal mortality is fairly frequent and significant with 49.6 percent of the respondents notwithstanding 50.6 percent of the respondents asserted that maternal mortality is not frequent in the rural communities of Nasarawa State, Nigeria. This entails that the incidence is very significant and substantial with an affirmation that the cases of maternal death still occurring in most rural communities of the State. Even though, there is an improvement in the utilization of maternal healthcare of services and the setting of primary health care in rural communities. Also, the reduction of the occurrence of maternal mortality in the rural communities is associated with

the present Sustainable Development Goals (SDGs) programme aim at reducing global maternal mortality ratio.

In an in-depth interview (IDI) conducted in the selected rural communities, there was clear agreement and consensus that maternal mortality is fairly frequent and significant in rural communities nevertheless the improvement and enhancement in the provision of primary health care service and the utilization of the maternal healthcare services among women in rural communities. Some participants/interviewees (Community health extension worker and Village head) in the sampled population of the study captured the general position of the participants as reported below:

> In recent time, the occurrence of maternal mortality is fairly frequent, disproportionate and asymmetrical. The nature of the occurrence is associated with State government commitment in improving maternal healthcare services through the setting of primary health care centre in rural communities, training and retraining of health care workers, provision of allowance package for healthcare workers in rural communities and the ongoing Sustainable Development Goals (SDGs) programme which main focused is the rural communities. Honestly speaking, there is an improvement in the provision of maternal healthcare services in the State but we still have cases of maternal death in most rural communities in the State. As at now, the incidence of occurrence of maternal death is not too common like before the introduction of intervention programmmes by the State Government and international donor agencies. (IDI/Male/42years/Ihuman -Awe LGA, Nasarawa State, Nigeria).

> As a community leader, the number of women dying with pregnancy has reduce considerably in my community. Before now, we don't have primary health care here. Our women have to traveled to the next community for maternal healthcare services but we are grateful to the last administration that assisted in building the primary health care clinic in the community. Our expectant women can now access maternal healthcare services without stress. Also, the healthcare workers in the clinic usually organized programmes for women especially pregnant women on the what is required and expected of them during the pregnancy period. Government and other donor agencies have also try in the provision of drugs and other consumables in the clinic. If not for this, the number of maternal death was high and very frequent. There are still cases of maternal death in the community but the level of occurrence is marginally frequent. We called on the state government and other relevant partners to do more in this regard to reduce the level of occurrence of maternal death in rural communities, the State and the country in general

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ISSN 2787-0308 (ONLINE)

(IDI/Male/51years/Andaha Daji-Akwanga LGA, Nasarawa State, Nigeria).

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Table 2: Risk Factors Associated with Maternal Mortality among Women in Rural Communities of Nasarawa State, Nigeria

Response	SA	A	NA	SD	N	Min	Max	Mean	Std. Error	Std. Dev
Maternal death is common with women who married early in this community	302	93	82	98	575	1.00	4.00	1.958	.0484	1.161
Women with low level of education are more likely to experience maternal death than those with higher level of education	241	138	105	91	575	1.00	4.00	2.080	.0462	1.109
Poor nutritional level predisposes women to maternal mortality	213	131	117	114	575	1.00	4.00	2.229	.0478	1.147
Maternal mortality is a common incidence among low income earners in community	210	135	99	131	575	1.00	4.00	2.262	.0490	1.175
Women without means of transportation are more likely to experience maternal mortality than those with appropriate means of transportation	291	110	58	116	575	1.00	4.00	2.516	.0496	1.190
Non-use of contraceptive predispose women to maternal death	154	133	138	150	575	1.00	4.00	2.493	.0477	1.144
Lack of involvement in reproductive decision making prompt women to maternal death	188	146	166	75	575	1.00	4.00	2.222	.0435	1.043

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Absence of involvement of women in household decision making predispose women to maternal death	241	89	109	136	575	1.00	7.00	2.260	.0523	1.255
Valid N (listwise)					575					

SA (Strongly Agree), A (Agree), NA (Not Agree), SD (Strongly Disagree), Source: Field Survey, 2023

Table 2 illustrates some of the risk factors associated with maternal mortality among women in rural communities of Nasarawa State, Nigeria. Data collected from the study indicates that women without means of transportation are more likely to experience maternal mortality than those with appropriate means of transportation with a weighed of $\overline{X}$=2.516, non-use of contraceptive predispose women to maternal death($\overline{X}$=2.493), maternal mortality is a common incidence among low income earners in community($\overline{X}$=2.262), absence of involvement of women in household decision making predispose women to maternal death($\overline{X}$=2.260), poor nutritional level predisposes women to maternal mortality($\overline{X}$=2.222) are the major risk factors associated with maternal mortality among women in rural communities of Nasarawa State, Nigeria. Other risk factors associated with maternal mortality among women in rural communities include women with low level of education are more likely to experience maternal death than those with higher level of education and maternal death is common with women who married early in this community. It is evident from the table that large proportion representing a mean of ($\overline{X}$=2.516) of the respondents in the sampled population of the study acknowledged that the women without means of transportation are more likely to experience maternal mortality than those with appropriate means of transportation. This means that road conditions, lack of transportation or location are barriers that cause delay in the utilization of maternal health care services in most part of the world especially rural communities of Nasarawa State, Nigeria. By and large, larger percent of women in rural communities ofNasarawa State live in more remote, inaccessible, distant and isolated areas, farther away from urban areas and health care centres.

The above assertion was confirmed in an in-depth interview with diverse interviewees that women without means of transportation are more likely to experience maternal mortality than those with appropriate means of transportation as restated by participants (Maternal Healthcare personnel and a Village head) that:

> Most of the maternal death we record here result from poor road network and mean of transportation. Poor means of transportation has impacted negatively on the maternal healthcare services. When women experiences complication during pregnancy, there is needs for abrupt and immediate medical care. Some of the rural dwellers living in these inaccessible, remote and isolated areas or communities have to travelled for a long distance to these medical centres thereby delaying these pregnant women reaching the

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hospital in time. Also, the mode of transportation and the roads also present problems. In some communities, the roads are not accessible and in bad shape. Unless the family has private means of transportation, they must depend on public transportation or the help of their neighbours thereby having significant impacts on the health of the expectant mother and the unborn child. We called on government to do the needful regarding this. Having good road network will go a long way in reducing the incidence of maternal death in the country especially in rural communities (IDI/Female/38years/WakamaLashe -Nasarawa Eggon LGA, Nasarawa State, Nigeria).

Means of transportation is a serious issue we are facing in this village. When our women are in labour we find it very difficult to transport them to the hospital and sometime this usually happened in the night. The road network is bad coupled with insecurity again. When this happened we are confused, the bad road and insecurity. Last month, an expectant woman and her husband were robbed on their way for the hospital. They lost money and valuables. This has psychological impact on the expectant woman on labour and family relative. I think if the road is accessible it will be of great help to the community. Another issue is the means of transportation. The only means of transportation here in this village motorcycle and bicycle. Just imagine moving a pregnant woman in labour on motorcycle or bicycle. This is terrible. But that is the situation here. The village need serious intervention from government and other relevant donor organizations (IDI/Male/56years/GidanSule -Keana LGA, Nasarawa State, Nigeria).

Table 3: Responses on Whether Respondents are Aware of the Risk Factors Associated with Maternal Mortality in Rural Communities of Nasarawa State, Nigeria

Response	Frequency	Percentage (%)
Yes	410	71.3
No	165	28.7
Total	**575**	**100.0**

Source: Field Survey, 2023

In an attempt to examine the level of awareness on risk factors associated with maternal mortality among women of childbearing age in rural communities of Nasarawa State, Nigeria. Table 3 show theresponses on whether respondents are aware of the risk factors associated with maternal mortality among women

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in rural communities of Nasarawa State, Nigeria. An overwhelming proportion of the respondents reported that they aware of the risk factors associated with maternal mortality among women in rural communities of Nasarawa State, Nigeria with an affirmation of 71.3 percent of the total respondents in the study area. This can be deduced from the data collected that larger proportion of the respondents established that they are aware of the risk factors associated with maternal mortality among women in rural communities as a result of concerted effort by the government and relevant stakeholders. Therefore, awareness of the risk factors associated with maternal mortality among the community members on the causes of maternal deaths will influence their decision to seek for medical help in the face of an emergency.

Discussion of Findings

Study finding on the prevalence of maternal mortality among women in rural communities of Nasarawa State, Nigeria established that the prevalence of maternal mortality is fairly frequent and very significant with 49.6 percent of the respondents in the population of the study. This finding is consistent with the trend observed in other studies (Landlocked Developing Countries Fact Sheet 2023) which show that the maternal mortality has been fairly frequent in recent time and has clear-fell suggestively. The global annual number of maternal deaths also fell significantly throughout this period, from 447 000 to 287 000, a decrease of more than a third. The global proportion of deaths to women of reproductive age that are due to maternal causes (PM) was estimated to be 12.7% in 2000 and this fell to 9.8% by 2022. In recent times, the global maternal mortality ratio declined by 38 per cent – from 342 deaths to 211 deaths per 100,000 live births, according to United Nations inter-agency estimates. This translates into an average annual rate of reduction of 2.9 per cent.

Regarding the risk factors associated with maternal mortality among women in rural communities of Nasarawa State, Nigeria, the findings of the study affirmed that means of transportation, non-use of contraceptive, low income, absence of involvement of women in household decision making and poor nutritional level are the major risk factors associated with maternal mortality among women in rural communities of Nasarawa State, Nigeria. This finding is in agreement with the work of Lissner and Weissman(2016) that transportation and infrastructures play a crucial role in reducing maternal mortalities. The issue affecting maternal mortality in Nigeria is the poor state of infrastructure, and transportation system and inability to access health care services especially the rural dwellers. The main challenge facing pregnant and nursing women in Nigeria is that of poor road network and inability to access maternal healthcare services. The location and travel distance to receive care by expectant mothers is a significant problem in developing countries other problems are cultural practices, beliefs, barriers or taboos preventing ante-natal care, attitudes and behaviours of midwives, lack of surgical care in primary health care and maternity clinics that are closer to the rural people, teenage pregnancies, lack of enlightenment about basic rules of hygiene exercises of expectant mothers, post-delivery complications, religious doctrines that limit healthcare intervention in complicated cases, inadequate drugs and limited access for vehicles and communication channels to reach where adequate care can be

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received and the inadequate infrastructural facilities to enhance healthcare delivery. The situation is further aggravated by poverty and ignorance, which accounts for women's inability to access health facilities, antenatal care and delivery services

Findings on the level of awareness on risk factors associated with maternal mortality among women of childbearing age in rural communities of Nasarawa State, Nigeria demonstrated that there has been an increase in the level of awareness of the risk factors associated with maternal mortality in the study location. The study findings also show that overwhelming proportion of the respondents agreed that they aware of the risk factors associated with maternal mortality among women in rural communities. This was supported by Kawuwa*et al* (2007) that relatively the rural dwellers are aware of the risk factors associated with maternal mortality among women in rural settlements. Awareness of the risk factors associated with maternal mortality among the community members of the causes of maternal deaths will influence their decision to seek help in the face of an emergency.

Conclusion and Recommendations

The study was carried out to assess maternal mortality among women in rural communities of Nasarawa State, Nigeria: a study of the risk factors. The study established that the frequency of maternal mortality is fairly frequent and significant in most rural communities of State. Even though, there is an improvement in the healthcare system with emphasis on interventions that will accelerate reduction of maternal mortality ratio such as availability of skilled birth attendants, promotion of facility delivery, availability of antenatal care in all facilities, antenatal care attendance, implementation of the emergency transport scheme in hard-to-reach rural areas, and family planning will help in accelerating attainment of sustainable Development Goals. This study also showed that means of transportation, non-use of contraceptive, low income, absence of involvement of women in household decision making and poor nutritional level are the major risk factors associated with maternal mortality among women in rural communities of Nasarawa State, Nigeria. Moreover, the study concluded that the level of awareness of the risk factors associated with maternal mortality among rural women in the study area tends to be significant as discovered in the study. There was a statistically significant relationship between risk factors associated with maternal mortality and awareness level. Based on the findings of the study, the following recommendations were made;

i. Policy effort should require the development of indicators of institutional, cultural and social conditions that generate and express basic needs and unmet needs related to the quality of maternal healthcare in society. As proposed by functionalism, under normal conditions, the various parts of society work together toward shared goals, producing order, stability, and equilibrium. Therefore, special emphasis must be placed on new and contemporary forms of vulnerability associated with maternal mortality among women in rural communities in the State and the country in general

ii. Entrenchment of social security for pregnant women especially rural women is quite essential for the improvement in maternal healthcare. Apparent low standard of living during pregnancy due to economic crunch appeared to be an indication for engagement in tedious economic activities during pregnancy. This can result into irregular pattern of food intake necessary to sustain the body during pregnancy. Therefore, every effort must be in place to reduce effect of poverty. Improving living conditions in such areas as good road network, provision of other infrastructure, income, housing, transportation, education, social support, and health services, will greatly impact on the wellbeing of pregnant women, thereby reducing the level of stress in raising the family economic status.

iii. There is need for interventions such as health education and community mobilization that aims to educate rural women on risk factors and danger signs associated with poor maternal health outcomes should be carried out in this area. Such can be done through the use of religious and community leaders; this would help promote awareness especially among women in rural communities. Contents of such health education messages should include early recognition of danger signs of maternal mortality, dispelling harmful cultural beliefs, registering early for antenatal care and prompt presentation at the hospital when in labour, risk of delivering in homes of traditional birth attendants, maternity homes and health centers, and the concept of early referral of women to the hospital should be reinforced.

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