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Antenatal Care Utilization and Maternal Health of Pregnant Women in Rural Akwa Ibom State, Nigeria

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Abstract
This study demonstrated the relationship between antenatal care (ANC) utilization and maternal health of pregnant women in rural Akwa Ibom State, Nigeria. A sample of 550 pregnant women was collected from 50 health centres across the State. A questionnaire of Antenatal care utilization and maternal health was employed to collect data. While the responses from the respondents were presented in frequencies and percentages; the Stepwise Regression Technique was applied to demonstrate the relationship between the two constructs and to identify those aspects of ANC that significantly interfere with maternal health. Findings revealed a robust positive relationship between ANC and maternal health as two parameters, namely: place of ANC consultation, and period of ANC commencement were found to significantly interfere with maternal health of the pregnant women. Findings suggest the need for aggressive ANC campaign with a focused and well implemented policy of free and compulsory ANC for pregnant women in rural communities of the state.

Keywords: Antenatal Care (ANC); Maternal Health; Utilization; Pregnant Women; Rural Areas; Akwa Ibom State

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I. Introduction

Good health and well-being for all at all ages forms Goal number 3 on the Sustainable Development Goals (SDGs). Underpinning the above goal is the target for improving maternal health by providing access to health care services particularly antenatal care (UNDP, 2019). Antenatal Care (ANC) refers to the care provided by skilled health care professionals to pregnant women and adolescent girls in order to ensure the best health conditions for both mother and baby during pregnancy (WHO, 2014). The components of antenatal care (ANC) include risk identification, prevention and management of pregnancy related or concurrent diseases, health education and promotion. The World Health Organization (WHO, 2016) provides guidelines for Antenatal Care Utilization. It recommended that women should attend 8 antenatal visits to access full and comprehensive health care. However, global trends indicate that only 85% of pregnant women attend at least one ANC visit with a skilled health professional, and only 58% attend at least 4 ANC visits (UNICEF, 2021).

Antenatal care utilization varies within and among countries. Studies have shown that the percentage of women who attended at least 4 ANC visits ranged from 18% in Guatemala to 85% in Nicaragua with the lowest levels of antenatal care observed in Sub-Saharan Africa and South Asia (WHO, 2014). In Nigeria according to National Demographic and Health Survey (NDHS, 2021), the percentage of women aged 15-49 who visited any health care provider (at least 4 times) during pregnancy between 2015 and 2020 was 57. A number of factors including socio-economic status, place of residence and level of education affect a woman's likelihood of attending ANC, contributing to disparities in access and utilization (Essien, Ekong, and Etteh, 2019).

Improving maternal health remains the core objective of antenatal care. Maternal health refers to health of women during pregnancy, childbirth and the postnatal period. High quality antenatal care (ANC) is an essential component of the reproductive, maternal, newborn and child health continuum of care. ANC reduces maternal and perinatal morbidity both directly, through detection and indirectly, through identification of women and girls at increased risk of developing complication during labour and delivery, thus ensuring referral to an appropriate level of care (WHO, 2016). ANC also provides an important opportunity to prevent and manage concurrent diseases through integrated service delivery. According to WHO (2016), what women want and expect from ANC is to have a "Positive Pregnancy experience" which include:

i. Maintaining physical and socio-cultural normality.

ii. Maintaining a healthy pregnancy for mother and baby (including preventing and treating risks, illness and death).
iii. Having an effective transition to positive labour and birth.
iv. Achieving positive motherhood level (including maternal self-esteem, competence and autonomy).

In spite of these expectations, it has been estimated that 25% of maternal deaths occur during pregnancy; and that between a third and half of maternal deaths are due to factors such as hypertension and antepartion haemorrhage which are directly related to inadequate care during pregnancy (WHO, 2010), (Meh et. al 2019), (Sagear, et. al, 2019). High maternal mortality has been associated with countries where there is low access and utilization of antenatal care services (WHO, 2014). Maternal mortality refers to deaths due to complications from pregnancy to childbirth, and is reported to be highest in Africa compared to other regions of the world. In 2017, according to WHO (2019), Sub - Saharan Africa alone accounted for two third ($^2/3$) of global maternal mortality, while Nigeria ranked second in the global maternal deaths. According to the Meh, Thind and Ryan (2019), the maternal mortality rate of Nigeria is 814 per 100,000 live births compared to 1 in 4900 in Europe. In fact, the report shows that 1 in 7 global maternal deaths occur in Nigeria. This implies that more than 50,000 pregnant women die each year in Nigeria.

In Akwa Ibom State, the NDHS (2021) statistics show that the State recorded 279 deaths per 100,000 births and ranks among the worst in the country. Findings by Kelechi (2021) have also shown that of all pregnant women in Akwa Ibom State who enrolls for antenatal care, only 13% of the women made at least 4 ANC visits compared to 8 visits recommended by WHO. In 2016 the low utilization ANC among pregnant women in Akwa Ibom State is even higher in rural areas as documented by Essien, Etuk, and Effiong (2019). The abysmal level of ANC uptake in Akwa Ibom State necessitated the creation of the healthy mother, healthy child project implemented by Antof Rural Resource Development Centre (ARRDEC) and funded by T.Y. Danjuma Foundation (kelechi, 2021). Though several studies elsewhere (Sagear, Kongnyang and Adedinpe, (2019); (Rai, Sigh and Kumar, 2016), Authur (2012) have attempted to link the incidence of maternal mortality to low antenatal uptake, the available empirical evidence establishing the relationship between ANC utilization and maternal health in Akwa Ibom State is scanty. There is need for further testing and empirical verification especially in the rural areas to reach valid conclusions. The present study therefore represents an attempt to further extend the frontiers of knowledge regarding ANC and maternal health in Akwa Ibom State.

II. Objectives of the Study

The study seeks to:
i. Assess the character of ANC utilization in the study area
ii. Assess the Maternal Health status of pregnant women in the study area
iii. Demonstrate the relationship between ANC utilization and maternal health of pregnant women in the study area.

III. Description of the Study Area

Akwa Ibom State is one of the 36 states in Nigeria. It is located at the South-East corner of Nigeria between latitudes $4^0 3'$ and $5^0 32'$ North and Longitudes $7^0 25'$ and $8^0 30'$ East. The state is divided into 31 Local Government Area (LGAs) with Uyo as the State Capital for administrative purpose (see Figure I).

Figure I: The Study Area

Source: Geography Department, University of Uyo, 2022

Akwa Ibom State is largely rural. According to NPC (2006), the 2006 population census for Akwa Ibom State was 3,902,051; out of this figure, 3,121,641representing 80% of total constituted rural population. However, the projected rural population for the state in 2022 (at an annual group rate of 2.83%) (being the national average for rural area) was 4,878,657. Akwa Ibom State has a high fertility rate of 8.1% and a low contraceptive rate of less than 20% (NDHS, 2015). In Akwa Ibom State, every woman of child bearing age is likely to give birth to about six children in her life time (NDHS, 2015). The above facts and figure put the state for the edge of a population crisis as more than 70% of her population lives in rural areas and competing on limited land resource for survival.

Regarding health care services, Akwa Ibom operates a 3-tier level of health care delivery. These are the primary, secondary and tertiary. Of these three, the Primary Health Care (PHC) is the most spatially spread since it involves the majority of grassroot population (Essien, 2018). Primary health care services are provided at Health Centres, Primary Health Centers, Comprehensive Health Centres, Health Posts and Clinics; Secondary Health Care Services are provided in General and Cottage Hospitals while the Teaching Hospital provides tertiary healthcare services. Within this hierarchical arrangement, higher-order centres are expected to receive referrals from the lower-order centres. Health indicators for the State as at 1999, according to NDHS (2015) show that the crude death rate was 12 per 1,000 population and infant mortality rate was 67 per 1,000 live births. Mortality rate for children under 5 years was 30 per 1,000 population; maternal mortality rate was 800 per 100,000 births and the level of maternal malnutrition was 7%. Life expectancy at birth was 54 years and HIV prevalence rate stood at 8% while access to safe water was 23%.

IV. The Study Methodology

a. Study Design

The study was designed as a cross-sectional survey conducted by the Authors in the 31 LGAs in Akwa Ibom State. The study used of a relatively larger samples across the 31 LGAs in the state. However, findings of this study are not presented in terms of spatial units but an attempt to view the big picture based on aggregate of individual responses. The State has a population of 305 primary health centres spread across the 31 LGAs, Akwa Ibom State Ministry of Health (AKMH, 2017) where Ante-natal health facilities/services are provided for pregnant women in rural areas. This study used a random sample of 55 rural communities with health centres (representing 18% of total). During the field visits, 10 respondents (pregnant women) were randomly targeted in each selected community/health centre giving a total of 550 respondents. Data collection was carried out using semi-structured questionnaire. A total of 550 respondents were contacted and administered questionnaires during the field survey. However, one was lost in transit leaving 549 questionnaires that were responded to and used for the analysis.

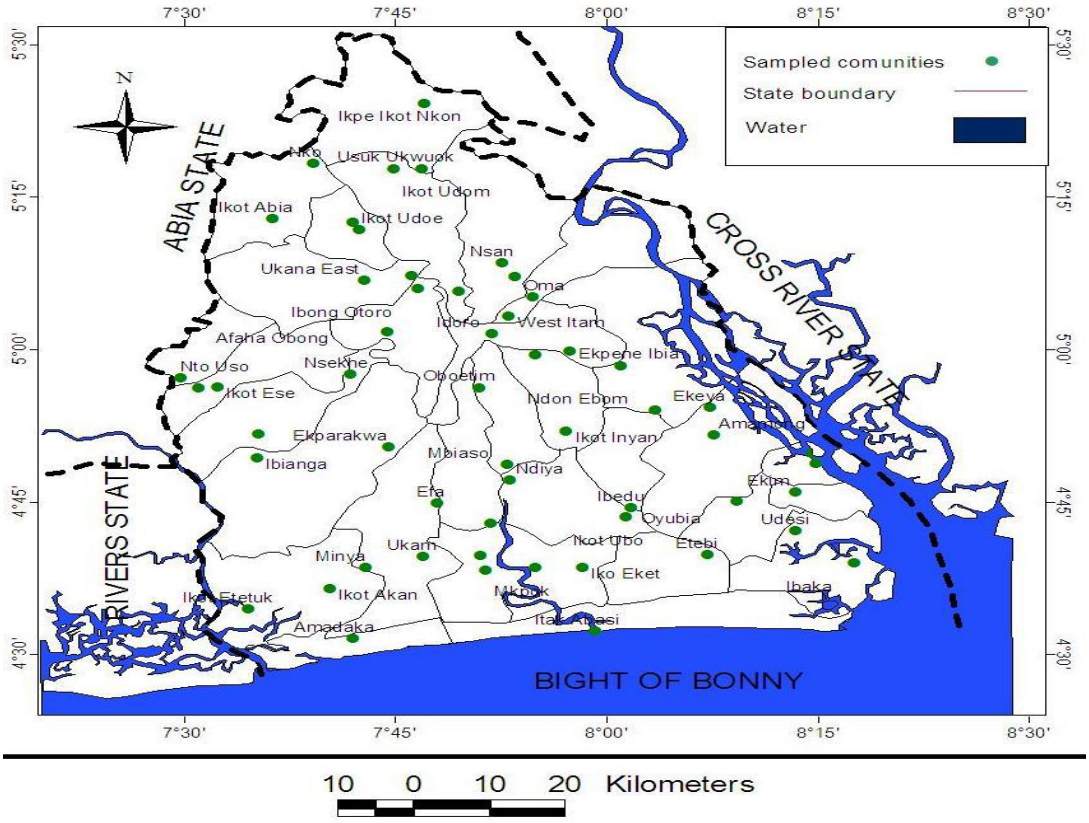

Figure 2: Sampled Antenatal Care Facilities in Akwa Ibom State

Source: Geography Department, University of Uyo, (2022)

b. Data Requirement

Two sets of data were collected for the study. First: the antenatal care utilization, (representing the independent variables displayed on Table 1). Second: the indicators of maternal health (representing the dependent variables displayed on Table 2).

Table 1: Measures of Antenatal care Utilization

S/N	Variable	Units of Measurement
1	Place of ANC consultation	Public/Private/Traditional Birth Centre
2	Frequency of consultation	Number
3	Place of delivery	Public/Private/Traditional Birth Centre
4	Period of Commencement of ANC consultation	Trimester

Source: Author's Survey, (2022)

Table 2: Indicators of Maternal Health

S/N	Variable	Units of Measurement
1.	Ever Hospitalized	Number
2.	Number of Times Hospitalize	Number
3.	Types of Illness	Type
4.	Frequency of Illness	Number
5.	Difficulty in delivery	Number
6.	Type of delivery	Type
7.	Number of Miscarriage	Number
8.	Number of Stillbirths	Number

Source: Author's Survey, (2022)

c. Data Analysis

The Stepwise Regression Analysis was employed to identify those aspects (variables) of ANC utilization that contribute highly to variance in maternal health status. The technique also provides clue on the strength and magnitude of effect of the ANC variables thereby proving the hypothesis that ANC utilization relates significantly with maternal health. The processes involved in the analysis and testing included the input of the independent variables-(that is, the variables defining ANC utilization, $X_1 - X_4$). The initial responses from the respondents were transformed via Z-score and presented as community level data appropriate for the analysis. The dependent variable (Y) Maternal health status of the pregnant women were also presented as community level data. This was done by assigning weighted scores ranging from zero to three (0 - 3) to the responses generated from the respondents. Further to this, the averages of the weighted scores were computed and aggregated to form a single value designated as "maternal health index" for each sampled community.

V. Results and Discussion

Antenatal Care Utilization in the Study Area

In Nigeria, the Primary Health care system was designed to accelerate health care services at the grassroots level especially for children and pregnant women (Essien, 2018). In Table 3, ANC utilization by the pregnant women is characterized by four items: facility of ANC consultation; frequency of consultation; place of delivery and period of ANC commencement. Considering the four parameters of ANC utilization, the health care facility where a pregnant woman receives ANC is by far the most crucial. Data in Table 3 indicated that 75% of the respondents consulted with the Primary Health Centre. Of the remaining; 18% consulted with the Traditional Birth Attendants while 7% consulted with Hospital. According to Essien, James and Effiong (2019), accessibility, (in terms of distance and travel cost to the nearest PHC) are the key factors inhibiting consultation with PHC and Hospital by pregnant women in rural Nigeria. The TBA therefore provides the intervening opportunity for pregnant women who cannot access PHC. Based on these findings, it can be inferred that the target of achieving universal Health coverage as stipulated by the Alma-Ata Declaration of (1978) still remains a mirage for the study area. Regarding the frequency of consultation, the WHO guidelines (2016) recommends a minimum of 8 ANC visits for pregnant women. However, the situation in the study area appears dismal. This is so because, only 30% of the respondents had more than 4 ANC visits (Table 3). 50% of the respondents had less than 4 ANC visits. The low frequency of ANC visit among rural women according to Essien et al (2019) can be attributed largely to socio-economic status of the women. According to their findings, income and educational disadvantage could hamper regular attendance to antenatal health care facilities among rural women in as much as each antenatal visit may be financially demanding. In terms of "Place of Delivery", availability as well as cost service are the major determinants particularly among rural households (Meh, Thind and Ryan, 2019); (Essien et al, 2019); (Kelechi, 2021). For the present study, data in Table 3 indicate that 52.1% and 9.1% baby delivery are either PHC or Hospital respectively. The remaining fraction of the respondents utilize either the TBA (24.4%); Church (5.1%) or home (9.3%) for delivery. The ideal situation should be a 100% use of the Hospital or PHC. The reality as observed in this study cannot be alienated from the facts highlighted above. The long wait till the second trimester before commencement of ANC as observed in the study area is another low point for ANC utilization in the area. According to Table 3, up to 50% of the pregnant women commence ANC during the second trimester. This also explains the reason for the low frequency of ANC visit by the pregnant women. Additionally, the marital status of pregnant women was pointed out as a mediating factor for ANC commencement. Married women are more likely to commence ANC consultation earlier than the single or separated (Essien et al, 2019). On the whole, the picture of ANC utilization in the study area remains unacceptably dismal and below WHO standards.

Table 3: ANC Utilization (N=549)

S/N	Variable	No. of Respondents	%
1.	**Facility of ANC Consultation**		
	PHC	410	75
	TBA	98	18
	Hospital	41	7
	Total	**549**	**100**
2.	**Frequency of Consultation**		
	Less than four times	277	50
	Four times	108	20
	More than four times	164	30
	Total	**549**	**100**
3.	**Place of Delivery**		
	PHC	286	52.1
	TBA	134	24.4
	Hospital	50	9.1
	Church	28	5.1
	Home	51	9.3
	Total	**549**	**100**
4.	**Period of commencement of ANC**		
	1st Trimester	184	34
	2nd Trimester	274	50
	3rd Trimester	91	16
	Total	**549**	**100**

Source: Authors' Finding, (2022)

Maternal Health Status of Pregnant Women in the Study Area

As noted earlier in this research, maternal health refers to the health of women during pregnancy, childbirth and the postnatal period. In this research, the maternal health of the respondents (pregnant women in the study area) were captured and characterized by eight key health indicators. Five indicators represented the health of the respondents during pregnancy. These include: "ever hospitalized", number of times hospitalized, Type of illness reported, incidence of Miscarriage and frequency of illness. Data in Table 4 revealed that only 10% of the respondents were ever hospitalized. Of the 10% that were hospitalized, only 36% had more than twice hospital admission during pregnancy. Furthermore, malaria was the dominant reported illness (49%) among the respondents. Only 17% reported a frequency of more than 5 times malaria attack during pregnancy and 83.2% had no incidence of miscarriage (Table 4). Essentially, the low rate of hospitalization, low frequency of reported illness and low miscarriage can be attributed to two factors – Facility at ANC consultation centre, and period of commencement of ANC. A review of data in Table 3 shows clearly that a large proportion of the women patronized the Primary Health Centre (PHC) and commenced ANC in the 1st and 2nd Trimesters. Accordingly, the early ANC commencement and ANC consultation at a health facility (PHC) where skilled professionals offer services avails the pregnant women the opportunity for prevention and management of pregnancy related or concurrent diseases as postulated by the WHO (2016).

In terms of health stability during childbirth, 83% of the respondents reported having no difficulty in delivery with a 100% normal delivery. Furthermore, 90% of the respondents reported no incidence of stillbirth. The seemingly appreciable health status of the respondents though tied to improved ANC utilization had some empirical antecedents. Studies by Ibeh (2018) in Anambra State, Nigeria, showed clearly the link between maternal health and ANC utilization among pregnant women in the area. Women who patronized government approved health facilities and had more than 5 ANC visits showed appreciably higher health outcomes compared to those with no record of ANC.

Table 4: Maternal Health indicators

	Variable	No. of Respondents Reporting Case	Percent
1.	**Ever Hospitalized**		
	Yes	53	10
	No	496	90
	Total	549	100
2.	**No. of times Hospitalized**		
	Once	10	19
	Twice	24	45
	More than twice	19	36
	Total	53	100
3.	**Type of illness reported**		
	Malaria	142	49
	Fever	51	18
	Swollen legs	95	33
	Total	288	100
4.	**Frequency of illness**		
	Not at all	288	52
	1-2 times	110	20
	3-4 times	93	17
	5 times and above	58	11
	Total	549	100
5.	**Difficulty in delivery**		
	Yes	94	17
	No	455	83
	Total	549	100
6.	**Type of Delivery**		
	Normal Delivery	549	100
	Caesarean Section	Nil	
	Total	549	100
7.	**Incidence of Miscarriage**		
	Not at all	457	83.2
	Once only	51	9.3
	More than once	41	7.5
	Total	549	100
8.	**Occurrence of Stillbirth**		
	Not at all	492	90
	Once only	46	8
	More than once	11	2
	Total	549	100

Source: Authors' Finding, (2022)

Relationship Between Maternal Health and ANC Utilization in the Study Area

There is a groundswell of theoretical proposition linking maternal health outcomes with ANC utilization. The empirical verification of this hypothesis is therefore important for advancing health care planning especially in developing societies like Nigeria. In this research, attempt was made to verify the relationship between the maternal health status of the pregnant women and their character of ANC utilization. The Stepwise Regression Technique was applied to demonstrate the relationship between Maternal Health and ANC as well as to generate models of Maternal Health using the different aspects of ANC as explanatory variables. Findings are presented in Table 5.

Table 5: Model summary for the influence of Antenatal care Utilization on Maternal Health

Parameter	Model I X_1: Place of ANC	Model II X_3 : Period of Commencement of ANC X_1 : Place of ANC
R	.850	.889
R-square	.723	.790
R-square change	.723	.066

F-value	138.529	97.568
Sig.	.000	.000
Std. Error the Estimate	1.1495	1.0119

Source: Data Analysis

Data in Table 5 contains the model for explaining variance in Maternal Health status of the pregnant women. Place of antenatal health care service consultation (X_1) and period of commencement of antenatal health care (X_3) were the main aspects of ANC utilization that govern maternal health outcome of the pregnant

women in the study area. Model 1 shows the single effect of "Place of antenatal consultation" on maternal health while Model II shows the combined effect of the two most important variables: X_1 and X_3 on maternal health. Jointly, the two variables accounted for 79 percent (R^2 = .790) of variance in maternal health status in the study area. Furthermore, the partial contribution of the variables to change in maternal health status indicated that the place of antenatal health care consultation (X_1) contributed 72.3 percent (R^2 change .723) while the period of commencement of antenatal health care (X_3) contributed 6.6 percent (R^2 change = 066). Essentially, therefore, the null hypothesis stating that utilization of antenatal health care services does not influence maternal health of pregnant women was rejected (R^2 = .790; F = 97.568; P < 0.05), while the alternative hypothesis has been proven. These findings further reinforce the assertion that there is direct effect of antenatal health care in perinatal outcomes. From the findings of this research, it is clear that pregnant women attending ANC in a health facility are likely to receive health care services that improves maternal health and further reduces risk during delivery. These findings are in line with the previous studies which indicated a higher mortality rates for women who delays ANC uptake and patronizes quacks rather than approved health facilities (Sagear et al, 2019).

V. Conclusion and Recommendations

This study has succeeded to demonstrate the relationship between maternal health and ANC uptake for pregnant women in rural Akwa Ibom State. Findings showed that ANC occurred preponderantly in the government health facilities.

That is, the Primary Health Centres (PHC) with majority of the pregnant women commencing ANC at the first and second trimester, and improved health status during pregnancy and childbirth. Specifically, the place of ANC consultation and the period of ANC commencement were the significant mediating factors for enhanced health status for majority of the pregnant women. Findings reinforce the need for a more robust and aggressive campaign for ANC utilization among rural women. Government and its ally in health care provision must align its policy with the principle of the universal health coverage of the United Nation by addressing the issues of equity and accessibility in the sharing of PHCs in rural areas. The inauguration of a free and compulsory ANC for pregnant women might be the needed policy action for improving ANC utilization and maternal health for rural women in Akwa Ibom State.

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