



Determinants of Ante-natal Care, Place of Delivery and Post-natal Care Services of Rural Women in Northern Nigeria

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Authors' contributions

This work was carried out in collaboration between all authors. Author OCN designed the study, managed the literature search, wrote the protocol and wrote the first draft of the manuscript. Authors AJT and RIA managed the analyses of the study and acquired the data. All authors read and approved the final manuscript.

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ABSTRACT

Aim: This study aimed to identify the determinants of Ante-natal care, place of delivery and post-natal care services of rural women in Northern Nigeria.

Study Design: It was a descriptive cross-sectional design

Place and Duration of Study: The study was conducted in selected rural areas of Sokoto State, Northern Nigeria during the periods January – February 2017.

Methodology: A multistage sampling technique was used to recruit 322 mothers for the study. Data was collected using a structured questionnaire and analyzed using IBM SPSS. The study examined attendance at Ante-natal care services, place of delivery and attendance of post-natal care as primary outcomes. Binary logistic regression using forced entry was used to compute the determinants of Ante-natal care services, place of delivery and post-natal services. The output of the regression analysis was presented as Odds Ratio (OR) with 95% confidence intervals. The

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level of significance was set at $p \leq 0.05$.

Results: Majority 258 (80.1%) of the mothers attended ante-natal care but only 45 (14%) of the mothers delivered in the hospital while only 104 (32.3%) went for post-natal visit. Determinants of Ante-natal care services, place of delivery and post-natal care was found to be maternal education and socioeconomic status. Mothers with formal education were twice more to attend Ante-natal care services ($p \leq 0.05$, OR = 2.11, 95% C.I = 0.99 – 4.450. Mothers with non-formal education were more likely to deliver at home ($p = 0.01$, OR = 0.29, 95% C.I = 0.14 – 0.59) while those in the upper class were more to attend post-natal care ($p = 0.03$, OR = 1.81, 95% C.I = 1.05 – 3.13).

Conclusion: The study demonstrates that maternal education and socioeconomic status influence Ante-natal care services, place of delivery and post-natal services. Therefore, there is need to encourage female-child education and women should be empowered to improve their socioeconomic status so that they can take charge of their health.

Keywords: Determinants; ante-natal care; place of delivery; post-natal services; Northern Nigeria.

1. INTRODUCTION

Maternal morbidity and mortality remains a public health problem in Nigeria due to the low use of reproductive health services among women of reproductive age-group [1]. Despite efforts, millions of women and children die or experience serious health problems related to pregnancy and childbirth each year in Nigeria [2]. To ensure optimum health outcomes for the mother and child, Antenatal care (ANC), delivery and post-natal care services are essential tools [3]. The key to reducing maternal mortality ratio is increasing attendance by skilled health personnel throughout pregnancy and delivery [4]. ANC from a trained provider is important to monitor the pregnancy and reduce morbidity risks for the mother and child during pregnancy and delivery [3]. In 2013, the Nigerian Demographic and Health Survey (NDHS) documented that 46.5% of rural women aged 15-49 had received antenatal care from a skilled provider. This finding still lives a lot of gap to fill [3].

Although modern maternal facilities have been provided, a lot of women in rural areas of Nigeria still patronize traditional birth attendants (TBAs) to take their deliveries at home [5]. Only 22.9% of births in Nigeria are delivered in a health facility in rural areas with 22.7% of deliveries being attended by a skilled birth assistant [3]. To reduce deaths arising from complications of pregnancy, skilled attendance during birth at a health facility is an important factor.

Postnatal care visits provide an ideal opportunity to educate a new mother on how to care for herself and her newborn baby and so, tackle any life-threatening conditions that may arise after delivery [3]. However, in rural areas of Nigeria, only 29% of women were found to have had a

postnatal checkup in the first two days after birth showing that in Africa, most women and newborns do not visit the hospital after birth [3, 6].

The low utilization of these reproductive health services could be influenced by several factors including demographic, socio-economic, cultural, obstetric and health system factors [7]. This study, therefore, aimed to identify the determinants of Ante-natal care, place of delivery and post-natal care services of rural women in Northern Nigeria.

2. MATERIALS AND METHODS

Study area: The study was carried out in Sokoto State in the North Western part of Nigeria. The State has 23 Local Government Areas and 3 senatorial districts namely Sokoto East, Sokoto South and Sokoto North.

2.1 Study Design

It was a descriptive cross-sectional study design.

2.2 Study Population

The study population comprised of women of reproductive age group (15 to 49 years old).

2.3 Sample Size

Using a proportion of women that attended ANC of 74.3% from a previous study [2], 322 mothers were recruited for the study using the formula $n = \frac{z^2 pq}{d^2}$ [8] and allowing for 90% response rate.

2.4 Sampling Technique

A multi-stage sampling technique was used to select the respondents from the 3 senatorial

districts viz; Sokoto North, Sokoto South and Sokoto East. Using a simple random sampling technique (balloting), 1 rural LGA was selected from each senatorial district after a line-listing of all the LGAs in the districts was done. A simple random sampling technique (balloting) was used to select 1 ward from each selected LGA after a line-listing of all the wards in each selected LGA was done. One (1) settlement was chosen from each selected ward using a simple random sampling (balloting). The house-holds to be recruited for the study were selected through systematic sampling technique. The number of households was obtained from each of the settlements following house numbering and their sampling intervals was calculated by $N/n = k$; where N = Number of households in each settlement; n = Number of women allocated to each settlement. Using the sampling interval, the households were then subsequently chosen. In each selected household, an eligible woman was identified and interviewed.

2.5 Data Collection

Data was collected on socio-demographic, household characteristics and ANC, delivery and post-natal care services using an interviewer administered questionnaire. The instrument was adapted from published articles [1,2,6] and was translated to Hausa (the local language in the communities) and back translated to English by two different scholars. The questionnaire was administered to the women in Hausa language by the research assistants who were trained on the objectives of the study, data tools and interpersonal communication. The socio-economic status was determined using the construct SES Index (a combination of the occupation and educational status of the respondents and spouses) proposed by Oyediji to classify households into five classes (I – V) [9]. Social economic status index I – V for every household was subsequently recoded to two variables: upper social class (class I – III) and lower social class (class IV – V) [10].

2.6 Data Analysis

Data was cleaned, entered into and analyzed using IBM SPSS. Univariate, bivariate and multivariate analysis were carried out using IBM SPSS. Chi square was used to test associations between predictor and outcome variables followed by binary logistic regression to determine the predictors. The study examined attendance at ANC services, place of delivery

and attendance of post-natal care as primary outcomes. Binary logistic regression using forced entry was used to compute the determinants of ANC, place of delivery and post-natal services. The output of the regression analysis was presented as Odds Ratio (OR) with 95% confidence intervals. Results were presented in tables and charts. The level of significance was set at $p \leq 0.05$.

3. RESULTS

3.1 Sociodemographic Characteristics of Respondents and Household

The mean age of the respondents was 27.4 ± 7.1 years. Most 307 (95.3%) of the mothers were married with only one being single (0.3%). Majority 226 (70.2%) had no western education and 255 (79.2%) were unemployed. Ninety-eight (30.4%) of the fathers had non-formal education and 224 (69.6%) had formal education. Ninety-five (29.5%) of the fathers were traders while 86 (26.7%) were civil servants. Majority of the families 194 (60.2%) were monogamous in nature with an average family size of 8.2 ± 6.5 . Most of the families 223 (69.3%) belonged to the lower class while a small percentage 99 (30.7%) belonged to the upper class (Table 1).

3.2 Respondents' ANC Attendance

Thirty-five respondents (10.9%) were found to be primiparous and 287 (89.1%) were found to be multiparous, average number of child alive was 3.9 ± 2.5 . Majority 258/322 (80.1%) of the mothers attended ante-natal care and 110 (42.6%) of them had 1 - 4 ANC. Of the 64 who did not attend ANC, 42 (65.6%) reported that the husband did not allow them (Table 2).

3.3 Respondents' Place of Delivery

Only 14% of the mothers delivered in the hospital; 0.9% were assisted by health workers; most of them (98.1%) delivered vaginally. Twelve (4.3%) reported that the hospital was too far and so they gave birth at home. (Table 3).

3.4 Respondents' Attendance of Post-natal Services

Of the 322 mothers, 104 (32.3%) went for post-natal visit while 134 (61.5%) did not attend post-natal because they felt it was not necessary (Table 4).

Table 1. Sociodemographic characteristics of respondents and household

Variables	Frequency (%)
Age distribution of Mothers (years)	(n = 322)
15 - 19	38 (11.8)
20 - 24	73 (22.7)
25 - 29	79 (24.5)
30 - 34	74 (23.0)
35+	58 (18.0)
Mothers' educational level	
None/Quaranic	226 (70.2)
Primary level	46 (14.3)
Secondary level	40 (12.4)
Tertiary level	10 (3.1)
Mothers' occupation	
Unemployed/full time housewives	255 (79.2)
Civil servant	1 (0.3)
Trader	58 (18.0)
Others	8 (2.5)
Fathers' educational status	
None	4 (1.2)
Quranic only	94 (29.2)
Primary level	52 (16.2)
Secondary level	77 (23.9)
Tertiary level	95 (29.5)
Fathers' occupation	
Unemployed	9 (2.8)
Farmer	85 (26.4)
Trader	95 (29.5)
Civil servant	86 (26.7)
Others	47 (14.6)
Type of family setting	
Monogamous	194 (60.2)
Polygamous	128 (39.8)
Socio-economic status	
Upper class	99 (30.7)
Lower class	223 (69.3)

Table 2. Respondents' ANC attendance

S/No	Variables	Frequency (%)
1	Attended ANC	
	Yes	258 (80.1)
	No	64 (19.9)
2	Frequency of ANC visit	
	1 - 4	110 (42.6)
	>5	68 (26.4)
	Don't remember	80 (31.0)
3	Reasons for not attending ANC	
	Husband not willing	42 (65.6)
	No money to pay for services	12 (18.8)
	Hospital far from home	10 (15.6)

3.5 Determinants of ANC Attendance

The key determinants of ANC determinant was maternal education and socio-economic class.

Mothers with formal education were twice more likely to attend ANC compared to those with non-formal education. (OR = 2.11; 95% C.I = 0.99 – 4.45).

Table 3. Respondents' place of delivery

S/No	Variables	Frequency (%)
1.	Place of delivery	
	Home	277 (86.0)
	Hospital	45 (14.0)
2.	Reasons for not delivering in hospital	
	It is not part of our culture	97 (35.2)
	Cost of delivery is too much	83 (29.9)
	Husband did not allow	58 (20.9)
	Health facility too far	12 (4.3)
	Others	27 (9.7)
3.	Mode of delivery	
	Normal	316 (98.1)
	Caesarean section	6 (1.9)
4.	Assistance during delivery	
	No- one	86 (26.7)
	TBA	111 (34.5)
	Mother-in-law	39 (12.1)
	Relative	83 (25.8)
	Health worker	3 (0.9)

Mothers who belonged to the upper class were two times more likely to attend ANC compared to those from the lower class (OR = 2.23; 95% C.I = 1.25 – 3.99). (Table 5)

3.6 Determinants of Place of Delivery

Maternal education was found to be the key determinant of place of delivery.

Respondents with non-formal education were more likely to deliver at home compared to those with formal education (OR = 0.29; 95% C.I = 0.14 – 0.59). (Table 6)

3.7 Determinants of Attendance of Post-natal Services

Socio-economic class was found to be the key determinant of attendance of post-natal services.

Respondents belonging to the upper class were more likely to attend post-natal services (OR = 1.81; 95% C.I = 1.05 – 3.13). (Table 7)

4. DISCUSSION

Access to antenatal care (ANC) in pregnancy, skilled care during childbirth, and care and support in the weeks after childbirth are crucial if maternal and child morbidity are to be reduced in

Nigeria [2]. A high level of ANC attendance was noted in this study. Studies in Zaria and Jos, Nigeria have also shown a high level of ANC attendance [2,11]. Of those who attended ANC, almost half had attended at least 4 antenatal clinics. This finding is similar to studies in Zaria, Nigeria that also revealed half of the respondents had attended at least 4 ANC [6,11]. However, this falls short of the required 90% recommended by the World Health Organization (WHO) [12]. The major reason given by the respondents for non-attendance of ANC was the husband not being willing. This shows that husbands as household heads play a major role in a woman accessing ANC services. The study identified maternal education and socioeconomic class as a determinant of attendance of ANC. These factors are consistent with those identified in Zaria and by Simkhada in a systematic review [6, 13]. Mothers who were formally educated were more likely to attend ANC compared to their counterparts. This result is similar to studies reported in Calabar, Nigeria, North India, Ethiopia and South India [14–17]. Education influences use of health care services as it increases the awareness and knowledge of the mother on the benefits of such services and also empowers her in decision making process in household issues including utilization of health services [6]. The socio-economic class of the respondents also positively influenced their attendance of ANC as those from the upper class were more likely to attend ANC than those from a lower class. This is in conformity with findings from other studies in Nepal and Karachi [18 -19]. Socioeconomic class improves both financial and geographic access to health services [6]. Although other factors such as age of mother, husband's educational level, working status of mothers were identified in these studies [6,13], these were not demonstrated in our study.

It is evident in Nigeria that most women still prefer to give birth at home [20–21]. Although a good proportion of women attended ANC in this study, only a few delivered in the hospital. This corroborates the high rate of home deliveries reported from studies in Jos and Zaria, Nigeria [2, 11, and 22]. Some of the reasons given for not delivering in the hospital included not being part of the culture, cost of delivery being too much, husband not allowing and hospital being far. These reasons given by the respondents were also given in another study in Lagos, Nigeria [23]. The role of the husband plays out again in the place of delivery as with attendance of ANC showing the importance of involving the

men in the health services provided. It was also revealed in this study that most of the deliveries were not supervised by skilled personnel. This finding was the same in similar studies in Nigeria [2,6,11,22]. Home deliveries in developing countries like Nigeria especially those living in rural areas is not to be encouraged as the conditions are not safe enough and most are not attended by skilled health professionals [24]. Some studies in developing countries have shown that the decision to deliver at home is related to socio-demographic and economic factors such as income, educational status and marital status [24 – 25]. In this study, maternal education was found to be the most important determinant of place of delivery as those with non-formal education tended more to deliver at home. Studies carried out in Nigeria, Nepal and Ethiopia also reported similar findings [4, 22, 26 – 27]. Educated women are more likely to seek modern health care and better knowledge about the advantages of maternal health care [28]. In contrast, a study in Kenya identified household's distance from the nearest maternity center and whether a household member had insurance as the most important significant predictor of place of delivery [29].

Among the components of maternal and child care service, post-natal care (PNC) services appear to be poorly utilized [12]. In this study, over half of the respondents did not utilize post-natal care services and their major reason was that it was not necessary. It is rather disheartening as large amounts of maternal and child deaths could be averted if adequate postnatal checkup is provided for both the mother and child [12]. Post-natal clinic attendance was however more than twice the hospital delivery rate in this study and it might be that unlike delivery where culture plays a major role in deciding place of delivery, ANC and PNC services do not have much cultural emphasis placed on them and making a higher proportion of the women accessing the services. This study found socioeconomic class of the respondents to be an important determinant of attendance of post-natal services as those in upper class were more likely to attend PNC. Social advantage as reflected in high wealth index makes it easier for the mothers to use postnatal care for their newborns [6]. However, our findings differ from a study in Nigeria that found mothers age, maternal and husband's level of education, parity, ANC attendance, health facility delivery and position of the decision maker as predictors of postnatal care [6].

Table 4. Respondents' attendance of post-natal services

S/NO	Variables	Frequency (%)
1.	Post – natal visit	
	Yes	104 (32.3)
	No	218 (67.7)
2.	Reasons for not attending post-natal	
	Not necessary	134 (61.5)
	No money for transportation	41 (18.8)
	Husband did not allow	43 (19.7)

Table 5. Determinants of ANC attendance

Variables	OR	95% CI	p-value
Respondents' educational level (Formal vs Informal)	2.11	0.99 – 4.45	*0.05
Respondents' occupation (Unemployed vs employed)	0.80	0.38 – 1.67	0.55
Fathers educational level (Formal vs Informal)	1.37	0.75 – 2.52	0.31
Socio-economic class (Upper class vs lower class)	2.23	1.25 – 3.99	*0.07
Parity (Primiparous vs multiparous)	0.92	0.34 – 2.52	0.87

p ≤ 0.05**Table 6. Determinants of place of delivery**

Variables	OR	95% CI	p-value
Respondents' educational level (Formal vs Informal)	0.29	0.14 – 0.59	*0.001
Respondents' occupation (Unemployed vs employed)	0.81	0.36 – 1.85	0.62
Fathers educational level (Formal vs Informal)	0.74	0.31 – 1.76	0.49
Socio-economic class (Upper class vs lower class)	0.94	0.44 – 1.98	0.86
Parity (Primiparous vs multiparous)	1.32	0.51 – 3.40	0.56

p ≤ 0.05**Table 7. Determinants of attendance of post-natal services**

Variables	OR	95% CI	p-value
Respondents' educational level (Formal vs Informal)	1.28	0.74 – 2.22	0.37
Respondents' occupation (Unemployed vs employed)	0.92	0.49 – 1.71	0.79
Fathers educational level (Formal vs Informal)	1.14	0.66 – 1.98	0.63
Socio-economic class (Upper class vs lower class)	1.81	1.05 – 3.13	*0.03
Parity (Primiparous vs multiparous)	1.47	0.63– 3.42	0.37

p ≤ 0.05

5. CONCLUSION

The study demonstrates that maternal education and socioeconomic status influence ANC, place of delivery and post-natal services. Therefore, there is need to encourage female-child education and women should be empowered to improve their socioeconomic status so that they can take charge of their health.

CONSENT AND ETHICAL APPROVAL

Ethical approval was obtained from the Sokoto State ethical committee. Informed consent was obtained from every respondent.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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