



Effects of Socio Demographic and Institutional Factors on Utilization of Antenatal Care Services among Pregnant Women in Damaturu, Yobe State, Nigeria

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Authors' contributions

This work was carried out in collaboration between all authors. Author MIB designed the study, performed the statistical analysis and wrote the protocol. Author MC managed the analyses of the study, literature searches and wrote the first draft of the manuscript. Authors US and MSG managed data collection. All authors read and approved the final manuscript.

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ABSTRACT

Pregnancy-related morbidities and mortalities remain a major challenge in developing countries like Nigeria where most of them were associated with poor/underutilization of antenatal care (ANC) services. This study, therefore, aims to examine the effect of socio-demographic and institutional factors on the utilization of antenatal care services among pregnant women in Damaturu, Yobe state, Nigeria. A descriptive study was carried out among 204 women (15-49 years) who have given birth within the last 12 months or are pregnant at the time of the study. Purposive sampling was used, and data were collected using structured questionnaire/interview guide. To establish the effect of socio-demographic and institutional factors on the utilization of ANC services, bivariate analysis using Pearson's chi-square test was conducted. The results showed that majority of the

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respondents are housewives between the ages of 30-34 years. Of these, only 49% of the women received the minimum required ANC of four visits. In the correlations analysis using chi-square test, age ($P < 0.001$), marital status ($P < 0.001$), level of education ($P < 0.001$), level of income ($P = 0.002$), distance of health facility ($P = 0.006$), opening days ($P < 0.001$), attitudes of health workers ($P < 0.001$) and quality of service provided ($P = 0.003$) were found to be strong indicators of utilization of ANC services. However, occupation ($P = 0.114$), religion ($P = 0.249$) and parity ($P = 0.333$) have no significant relationship with utilization of ANC services. The study thus concluded that increase in awareness and accessibility to health facilities were crucial towards enhancing women utilization of ANC services.

Keywords: Antenatal services; study; health facilities; pregnant women.

1. INTRODUCTION

Antenatal care is a type of preventative care with the goal of providing regular check-ups that allow health care providers identify, treat and prevent potential health problems throughout the course of the pregnancy while promoting healthy lifestyles that benefit both mother and child [1,2,3]. The availability of routine antenatal care has played a part in reducing maternal death rates and miscarriages as well as birth defects, low birth weight, and other preventable health problems. At the initial antenatal care visit and with the aid of a special booking checklist the pregnant women become classified as either normal risk or high risk [2]. Most women will progress through pregnancy in an uncomplicated fashion and deliver a healthy infant with little medical intervention. However, a significant number will develop medical or fetal complications. The aim of antenatal care is to identify women who will require specialist support and ensure the spontaneous progression of pregnancy [1]. The centre for disease control and Prevention (CDC) opined that, prevention of pregnancy-related deaths, adherence to recommended antenatal schedules is very crucial [2].

The Nigerian government is working hard toward provision of healthcare centres across communities to improve antenatal services and minimize maternal deaths [4]. Despite this intervention, underutilization of these facilities and services by pregnant women still exist. The underutilization varies from region to region and from state to state [4]. Underutilization of antenatal care services is generally growing in many parts of Nigeria, which has been linked to some maternal deaths [4,5,6]. Yobe state as one of the core northeastern states has some of the lowest level of antenatal care rates as well as highest maternal mortality rate in the country [4,7], hence the need to assess barriers to use of

ANC services in the state, taking the state capital (Damaturu) as the study area.

1.1 Aim and Objectives

The aim of this study was to examine the effect of socio-demographic and institutional factors on utilization of antenatal care services among pregnant women in Damaturu, Yobe state, Nigeria. The specific objectives were; to determine the level of utilization of antenatal care services in Damaturu, to examine the influence of socio-demographic factors on the utilization of antenatal care services, to examine the effect of institutional factors on the utilization of antenatal care services.

2. RESEARCH METHOD

2.1 Research Design and Instrument

This study was a descriptive survey. It used descriptive design as it offered a precise description of pregnant women utilization of ANC services as they exist. Data were collected using structured questionnaires for respondents who can read and understand the English language. The same questionnaire was transcribed into a checklist and used to interview women who could not read/understand the English language.

2.2 Study Population and Sampling

The population of this study comprised of women of reproductive age (15-49 years) who gave birth within the last 12 months or are pregnant at the time of the study. The total population of women in the reproductive age in Damaturu was 19,569 [4]. The sample size for this study was calculated using Kish and Leslie formula [8].

$$n = \frac{Z^2 \times P \times (1-P)}{e^2}$$

Where;

Z^2 = The abscissa of the normal curve that cuts off an area α at the tails = 1.96.

e = Error tolerance which is 95% confidence level = 0.05.

p = the estimated proportion/prevalence of an attribute that is present in the population (According to UNICEF [9], 86% of women attended at least one antenatal care during pregnancy in Nigerian urban areas like Damaturu) = 0.86.

Therefore, n (Sample size) = 185.

Thus, the minimum sample size for this study was 185. However, 25% (46) of this number was added in anticipation of incomplete/poorly filled questionnaires. Hence the sample size for this study was rounded up to 231. Purposive sampling technique was employed in selecting the 231 women that form the study sample, as only women who fit in the purpose of the study were selected. The study setting (Damaturu town) was stratified into four catchment areas, out of which an average of 58 respondents each was purposively selected to participate in the study.

2.3 Data Analysis

The data collected were processed into Microsoft Office Excel (2010) and analyzed using SPSS (version 16). Descriptive analysis of Numerical and categorical data was conducted. Bivariate analysis to compare independent variables with dependent variables using Pearson's chi-square test was conducted. Independent variables were considered statistically significance for effect measure at $P < 0.05$. Of the 231 questionnaires served, 204 (88%) were fully filled, hence were used for analysis.

3. RESULTS

3.1 Socio-demographic Characteristics of Respondents

The result (Table 1) indicated that majority of the respondents (35%) were between the ages 30-34, most of which are married housewives. About half of them (49%) attained at least secondary education, and more than half (64.2%) are of low-income level. Most of the respondents (41.7%) have more than three children, hence bear a large family.

3.2 Level of Utilization of Antenatal Care Services among Mothers in Damaturu

The majority (83.60%) of the respondents acknowledged that they attended antenatal care services at least once compared to the 16.40%, who never attended antenatal services (Fig. 1).

3.2.1 Frequency of attendance of antenatal care services among mothers in Damaturu

Of the respondents that attended ANC (Fig. 2), about half of them (51%) attended a maximum of three times during an entire pregnancy period, which does not coincide with the recommended four visits by WHO.

Table 1. Socio-demographic characteristics of respondents (N=204)

Variable	Category	N	Percent
Age (years)	15-19	19	9.3
	20-24	18	8.8
	25-29	21	10.3
	30-34	72	35.3
	35-39	38	18.6
	40-44	24	11.8
	45-49	12	5.9
Occupation	Housewife	90	44.1
	Farmer	24	11.8
	Business	49	24.0
	Civil servant	39	19.1
	Others	2	1.0
Marital status	Single	10	4.9
	Married	152	74.5
	Divorced	9	4.4
	Widowed	21	10.3
	Separated	12	5.9
Religion	Islam	150	73.5
	Christianity	45	22.1
	Traditional	9	4.4
Level of education	Primary	52	25.5
	Secondary	65	31.9
	Tertiary	36	17.6
	None	51	25.0
Level of income	Low	131	64.2
	Moderate	56	27.5
	High	17	8.3
Parity	0-1	58	29.1
	2-3	58	29.1
	>3	83	41.7

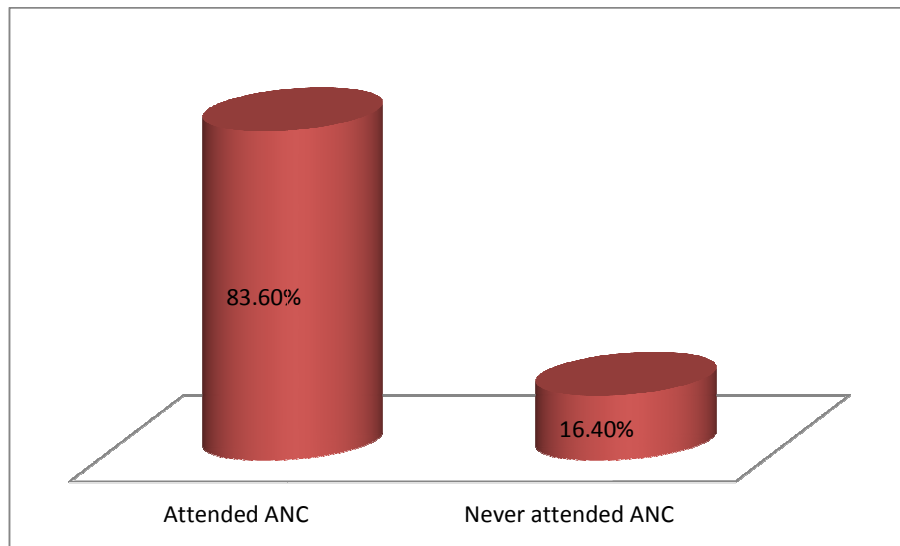


Fig. 1. Level of utilization of antenatal care services among mothers in Damaturu

3.2.2 Barriers to attendance of antenatal care service among mothers in Damaturu

According to the respondents (Fig. 3), the major barriers to ANC range from financial burden associated with attending ANC (32.3%) to poor attitude of health workers (6.5%). Other barriers include the influence of In-laws, lack of autonomy in making a decision, cultural influence and preference to traditional birth attendance TBAs (Table 2).

3.3 Bivariate Analysis Using SPSS Version 16

This objective was ascertained by carrying out a chi-square test between utilization of ANC and socio-demographic or institutional factors. The Pearson's chi-square test was adopted at a reference value $\alpha = 0.05$. A p-value less than the reference (α) shows a significant relationship between the variables as shown in Table 3 and Table 4.

3.3.1 Socio-demographic factors influencing utilization of antenatal care services in Damaturu

The results in Table 3 show that age of respondents significantly affect utilization of ANC ($\chi^2 = 27.655$, $P = <0.001$), with the lower age group (e.g. 15-19years) having fewer chances of attending antenatal care (6.0% attendance against 18.2% non-attendance). This is in comparison to higher age group (45-49) with

greater chances of attendance. The results also show a significant relationship between marital status and utilization of ANC services ($\chi^2 = 20.990$, $P = <0.001$), with 78.6% of married respondents who uptake ANC services compared to 60.6% who do not. Similarly, a significant relationship between educational status and utilization of ANC services exist ($\chi^2 = 27.395$, $P = <0.001$), with 35.7% of respondents with secondary level of education, who sought ANC services, in comparison to 25.0% for primary education and 20.2% among Tertiary education. Furthermore, a significant relationship between utilization of ANC services and level of income ($\chi^2 = 12.928$, $P = 0.002$) exist whereby 58.3% sought ANC services among low earners, 31.3% for moderate earners and 10.1% among high earners. On the other hand, Occupation ($\chi^2 = 5.951$, $P = 0.114$), Religion ($\chi^2 = 2.784$, $P = 0.249$) and Parity ($\chi^2 = 2.197$, $P = 0.333$) have no significant relationship with utilization of ANC services.

3.3.2 Institutional factors influencing utilization of antenatal care services in Damaturu

From the results in Table 4, Distance of health care facility has a significant relationship with utilization of ANC service ($\chi^2 = 10.186$, $P = 0.006$), where 48.2% of respondents that are 0-5km away from health facility, 49.4% of 6-10km and 2.4% of respondents >10 Km away from health facility sought for ANC services respectively. Opening days of ANC services also has a

significant relationship with utilization of ANC services ($\chi^2= 86.307$, $P= <0.001$), where 41.1% of daily opening days, 1.8% of weekly opening days, 51.8% of twice a week opening days and 5.4% of those who don't know the opening days of ANC utilizes ANC services respectively. Similarly, a significant relationship between the attitude of health workers and utilization of ANC services exist ($\chi^2= 19.887$, $P= <0.001$). The respondents that acknowledged health workers to be friendly, 63.1% utilizes ANC services

compared to 23.2% of respondents who acknowledged workers not friendly. Additionally, quality of services provided has a significant relationship with the utilization of ANC services ($\chi^2= 19.887$, $P= 0.003$). 50.0% of respondents that acknowledge the good quality of services utilize ANC services, 39.3% that acknowledge the fair quality of services and 10.7% that acknowledge the excellent quality of services utilizes ANC services respectively.

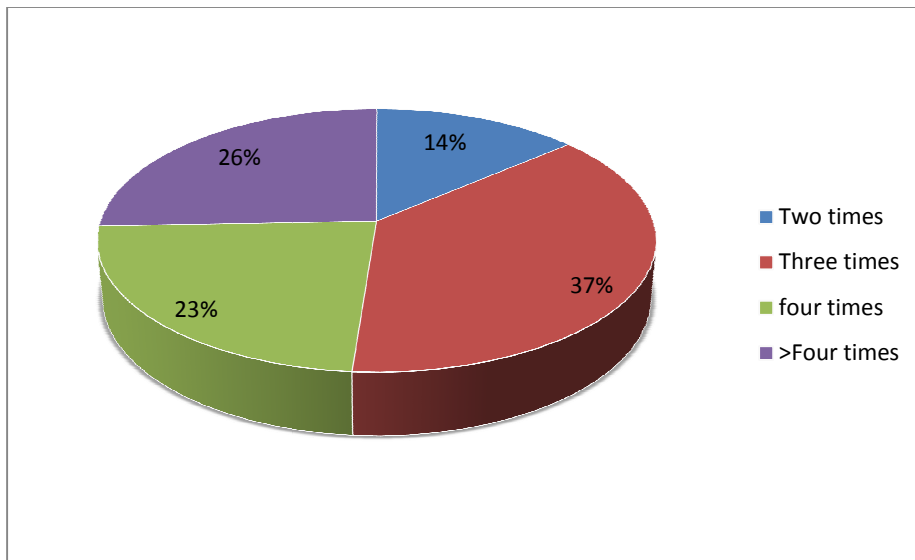


Fig. 2. Frequency of attendance of antenatal care services among mothers in Damaturu

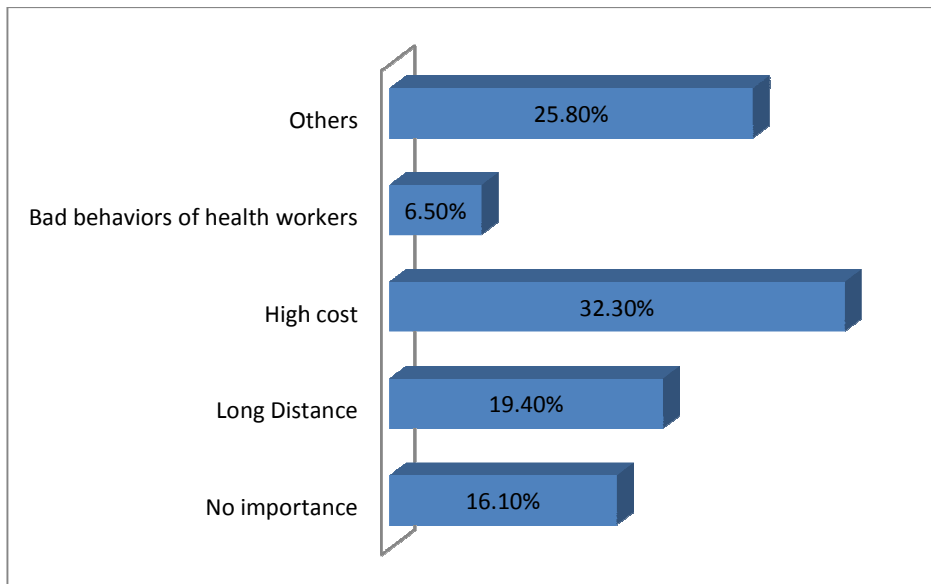


Fig. 3. Major barriers to attending antenatal care service among mothers in Damaturu

Table 2. Other barriers to attendance of antenatal care service among mothers in Damaturu. (N=53)

Responses	Frequency	Percentage
Influence of In-laws	19	35.8
Autonomy	9	16.9
Culture	7	13.4
Prefer TBAs	18	33.9

Table 3. Socio-demographic factors influencing utilization of antenatal care services in Damaturu

Variable	N	Uptake	No uptake	χ^2	the
Age (years)					
15-19	16(8.0)	10(6.0)	6(18.2)	27.655	<0.001
20-24	18(9.0)	18(10.7)	0(0.0)		
25-29	21(10.4)	13(7.7)	8(24.2)		
30-34	72(35.8)	56(33.3)	16(48.2)		
35-39	38(18.9)	37(22.0)	1(3.0)		
40-44	24(11.9)	24(14.3)	0(0.0)		
45-49	12(6.0)	10(6.0)	2(6.1)		
Occupation					
Housewife	90(44.8)	70(41.7)	20(60.6)	5.951	0.114
Farmer	24(11.9)	20(11.9)	4(12.1)		
Business	48(23.9)	41(24.4)	7(21.2)		
Civil servant	39(19.4)	37(22.0)	2(6.1)		
Marital status					
Single	7(3.5)	2(1.2)	5(15.2)	20.990	<0.001
Married	152(75.6)	132(78.6)	20(60.6)		
Divorced	9(4.5)	9(5.4)	0(0.0)		
Widowed	21(10.4)	17(10.1)	4(12.1)		
Separated	12(6.0)	8(4.8)	4(12.1)		
Religion					
Islam	147(73.1)	119(70.8)	28(84.8)	2.784	0.249
Christianity	45(22.4)	41(24.4)	4(12.1)		
Traditional	9(4.5)	8(4.8)	1(3.0)		
Level of education					
Primary	52(25.9)	42(25.0)	10(30.3)	27.395	<0.001
Secondary	62(30.8)	60(35.7)	2(6.1)		
Tertiary	36(17.9)	34(20.2)	2(6.1)		
None	51(25.4)	32(19.0)	19(57.6)		
Level of income					
Low	128(63.7)	98(58.3)	30(90.9)	12.928	0.002
Moderate	56(27.9)	53(31.5)	3(9.1)		
High	17(8.5)	17(10.1)	0(0.0)		
Parity					
0-1	57(28.8)	49(29.2)	8(26.7)	2.197	0.333
2-3	58(29.3)	52(31.0)	6(20.0)		
>3	58(41.9)	67(39.9)	16(53.3)		

 $\alpha = 0.05$

4. DISCUSSION

This study evaluated the influence of sociodemographic and institutional factors on the utilization of ANC services in Damaturu. Findings

from the study show that majority (83.60%) of the respondents acknowledge having attended antenatal care services at least one time compared to the 16.40% of the respondents who never attended antenatal care services in

Table 4. Institutional factors influencing utilization of antenatal care services in Damaturu

Variable	N	Uptake	No uptake	χ^2	The
Distance					
0-5 Km	87(43.3)	81(48.2)	6(18.2)	10.186	0.006
6-10 Km	109(54.2)	83(49.4)	26(78.8)		
>10 Km	5(2.5)	4(2.4)	1(3.0)		
Opening days					
Daily	71(35.3)	69(41.1)	2(6.1)	86.307	<0.001
Weekly	3(1.5)	3(1.8)	0(0.0)		
Twice	95(47.3)	87(51.8)	8(24.2)		
Don't know	32(15.9)	9(5.4)	23(69.7)		
Attitude of health workers					
Friendly	118(59.3)	106(63.1)	12(38.7)	19.887	<0.001
Not friendly	58(29.1)	39(23.2)	19(61.3)		
Caring	23(11.6)	23(13.7)	0(0.0)		
Quality of service					
Poor	2(1.0)	0(0.0)	2(6.1)	13.991	0.003
Fair	81(40.3)	66(39.3)	15(45.5)		
Good	100(49.8)	84(50.0)	16(48.5)		
Excellent	18(9.0)	18(10.7)	0(0.0)		

$\alpha = 0.05$

Damaturu. However, among those that attended, only less than half completed at least the recommended four visits by WHO. This is similar to the study conducted in Kenya which shows that 90% women received antenatal care at least once during their pregnancy period [10]. It is further in line with the findings of UNICEF that indicated 86% of Nigerian pregnant women in urban areas attending at least one antenatal care during pregnancy [9]. Furthermore, only about one-quarter of the respondents indicated more than four ANC visits during their pregnancy period, mostly in compliance with the routine ANC visits by their healthcare facility. This finding is similar to a study conducted in India, whereby only 29% of pregnant women attended ANC services more than four times [11]. The low level of utilization of ANC to the minimum of four times visits as required by WHO in this study area could be associated with poor knowledge of the importance of ANC as well as poor attitudes of health workers after first or second visits.

A key socio-demographic variable found to be significantly associated with utilization of ANC is the age of women ($\chi^2 = 10.186$, $P = 0.006$), which indicates that higher age groups (45+) were more likely to use ANC services compared to those within the ages of 15-19. This finding is supported by the study of Mutua in Zambia which shows that older women with more than one child were more likely to utilize ANC services compared to young women with single parity [12]. Marital status was also found to have a

significant relationship with ANC utilization ($\chi^2 = 20.990$, $P = <0.001$) in this study, whereby more married women (78.6%) utilizes ANC services compared to very few (1.2%) unmarried women. This is similar to the findings by Chaitra in 2008 that marital status has a significant relationship with ANC utilization. Unmarried pregnant women are less likely to seek ANC services due to a lack of economic and social support from parents, guardians and spouses and also were less likely to have planned pregnancy and to attend antenatal care. [13] However, Occupation ($\chi^2 = 5.951$, $P = 0.114$) and religion ($\chi^2 = 2.784$, $P = 0.249$) were not found to be significant in determining the utilization of ANC services in Damaturu. This is in contrast with a study in Cameroon, whereby women continue to seek care from traditional midwives in spite of a sufficient number of government maternity units to guarantee appropriate disposal of the placenta, which plays a vital role in their traditional religion [11]. Similarly, the findings of this study show that parity has no significant relationship ($\chi^2 = 2.197$, $P = 0.333$) with the utilization of ANC services. This is in contrast with a study in Kenya and Zambia which shows that women with more than one child and older were more likely to utilized ANC services compared to young women and with single parity [12].

The findings of this study also show a significant relationship between educational status among women in Damaturu and utilization of ANC

services ($\chi^2= 27.395$, $P= <0.001$). This is in consistence with a study done in a North Indian city which showed that knowledge is positively associated with all factors related to women's utilization of antenatal service. Hence, highly educated women were more likely to attend ANC due to more freedom of movement than the less educated ones [14]. Similarly, in a study on the determinants of antenatal care services in rural India, a correlation exists between household income and utilization of antenatal services. It was evident that as a result of lack of productive resources for women, income earned by women had a negative impact on utilization of Antenatal care (ANC) and post-natal care (PNC) [15]. This is in line with the finding of this study that women with higher income level are more likely to utilize ANC services than those of lower income level ($\chi^2= 12.928$, $P= 0.002$).

Exploring institutional factors associated with ANC utilization, this study shows a significant association between distance of health facilities and utilization of ANC services ($\chi^2= 10.186$, $P= 0.006$), whereby 48.2% of respondents that live within 0-5km utilizes ANC services compared to only 2% of respondents that live in areas >10km to a health facility. This means that proximity to healthcare facilities is significantly associated with utilization of ANC services. This finding is similar to the study by Kaman [16], whereby the distance of health facilities determine the utilization of ANC services. However, a similar study revealed that, government health facilities seemed to be conveniently located, yet that proximity did not guarantee utilization due to inconvenient ANC days to a significant number of pregnant women [17]. This is evident to the finding of this study that opening days of ANC services has a significant relationship with ANC utilization ($\chi^2= 86.307$, $P= <0.001$).

Quality of care is an equally important consideration in the decision to seek for care. Accordingly, the study of Khan [18], reflects a finding of this study, whereby the quality of services provided has a significant relationship with the utilization of ANC services ($\chi^2= 19.887$, $P= 0.003$). It was found that 50.0% of respondents that acknowledged the good quality of services utilize ANC services compared to 39.3% that acknowledge the fair quality of services and 0% that acknowledge poor quality of services respectively. Therefore, those acknowledging quality of services are more than twice likely to utilise ANC services than those who acknowledge poor quality of services. The

finding of this study further indicated the poor attitude of health workers as a barrier to utilization of ANC services ($\chi^2= 19.887$, $P= <0.001$), with 23.2% of the respondents that claims unfriendly attitude of health worker utilize ANC services in comparison to 63.1%, who acknowledged friendly attitude. Poor attitude of health care workers is also common in other parts of Nigeria [19] as well as other African countries like Kenya [20]. These negative attitudes were found to significantly reduce the number of ANC visits as well as influencing utilization of services from traditional birth attendants.

5. CONCLUSION

This study identified a positive relationship between age, marital status, level of income, educational status, a distance of health facilities, opening days (ANC days), the attitude of health workers, quality of service and utilization of ANC services. On the other hand, occupation, religion and parity were found with no significant association with utilization of ANC services. The study thus concluded that both sociodemographic and institutional factors could significantly influence the use of ANC services. Therefore, it is recommended that education, especially beyond primary school needs to be strongly encouraged by the Government. This is because education has a significant impact on women decision making toward seeking healthcare services. The government should further strengthen access to healthcare services, particularly at primary and secondary levels to ensure women utilization of such services. Furthermore, health personals should review and strengthen reproductive health programs and ensure that they are friendly and need-based.

CONSENT AND ETHICAL APPROVAL

As per international standard, this study was approved by Yobe State Ministry of Health, Nigeria. A formal letter was addressed to the ministry, and formal permission was given to conduct the study. Before data collection, written consent was sought from each participant and assured of anonymity.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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