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Factors affecting utilization of antenatal care services and institutional delivery at Koghum in Jos South, Plateau State, Nigeria

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Access to antenatal care services promotes safe motherhood and delivery. This study identified factors influencing the utilization of antenatal care services and health facility-based delivery. A cross sectional survey was conducted. Households were enumerated, and a systematic sampling method was deployed. A sample size of 200 was used. Of the 200 HHs, 198 women were interviewed using pretested semi-structured questionnaires. Data was collected on socio-demographics, attendance at the antenatal clinic (ANC), institutional delivery, and reasons for non-utilisation of ANC services. Data analysis was conducted using Epi Info version 3.5.3. The median age of respondents was 29 years (range: 17 - 55). Overall, 192 (97%) women had at least one ANC visit, 116 (58.6%) had ≥ 4 ANC visits and 93 (47.9%) commenced ANC in the second trimester in the last delivery. One hundred and twenty-five (63.1%) had their last delivery at home by a traditional birth attendant (TBA). The independent risk factors for utilization of ANC were partners' consent (aOR 11.5; 95% CI 1.6-82.3) and knowledge on the importance of ANC (aOR 7.4; 95% CI 1.4-38.6). Pregnant women in a polygamous union were less likely to use to ANC (aOR 0.1; 95% CI 0.0 - 0.4). Being a woman with a lower educational status was associated with-assisted home delivery (aOR0.3; 95% CI 0.1-0.7). Most women utilized ANC services at least once. Community sensitization on the benefits of ANC and institutional delivery should be targeted at women in polygamous unions, with low educational level and without partner's consent for ANC.

Keywords: Antenatal care, utilization, home delivery, Jos Plateau Nigeria.

INTRODUCTION

Antenatal care (ANC) during pregnancy is imperative for the health of the mother and the development of the unborn child (Agus and Horiuchi, 2012). It is a necessary component of maternal health to identify complications

and danger signs during pregnancy (Abel et al., 2012). Pregnancy is a crucial time to promote healthy behaviors and parenting skills. Regular ANC links the woman and her family with the formal health system increases the

chance of using a skilled attendant at birth and contributes to good health through the life cycle. Antenatal care also provides women and their families with appropriate information and advice for a healthy pregnancy, safe childbirth, and postnatal recovery, including care of the newborn, promotion of early, exclusive breastfeeding, and assistance with deciding on future pregnancies to improve pregnancy outcomes (Agus and Horiuchi, 2012; Abel et al., 2012; Awusi et al., 2009). Inadequate care during this time breaks a critical link in the continuum of care and affects both women and babies (Adewemimo et al., 2014).

Globally, it has been estimated that 25% of maternal deaths occur during pregnancy (Dairo, 2010). Between a third and a half of maternal deaths are due to causes such as hypertension (pre-eclampsia and eclampsia) and antepartum hemorrhage, which are directly related to inadequate care during pregnancy (Adewemimo et al., 2014; Edie et al., 2015). Moreover, 71% of women receive ANC and >95% of pregnant women have access to ANC in industrialized countries. In sub-Saharan Africa, 69% of pregnant women have at least one ANC visit, more than in South Asia, at 54% (Adewemimo et al., 2014). In Africa, 80% of women have access to three or more ANC visits (Awusi et al., 2009). However, to achieve the full life-saving potential that ANC promises for women and babies, four visits providing essential, evidence-based interventions, a package often called focused antenatal care are required (Agus and Horiuchi, 2012; Abel et al., 2012; Hossain and Hoque, 2015). Essential interventions in ANC include identification and management of obstetric complications such as preeclampsia, tetanus toxoid immunization, intermittent preventive treatment for malaria during pregnancy (IPTp), and identification and management of infections including HIV, syphilis and other sexually transmitted infections (STIs) (Awusi et al., 2009; Ikeoluwapo and Ajayi, 2013; Kasabiiti, 2004). An effective ANC package depends on competent health care providers in a functioning health system with referral services and adequate supplies and laboratory support (Abel et al., 2012).

In sub-Saharan Africa, an estimated 900,000 babies die as stillbirths during the last 12 weeks of pregnancy. The World Health Organisation estimated that babies who die before the onset of labor, or antepartum stillbirths, account for two-thirds of all stillbirths in countries where the mortality rate is > 22 per 1,000 births, nearly all African countries (Mulat et al., 2015).

In Nigeria, one of the major causes of maternal deaths is inadequate motherhood services such as ANC (Dairo, 2010). Approximately two-thirds of all Nigerian women

and three-quarters of rural Nigerian women deliver outside of health facilities and without medically skilled attendants present (Dairo, 2010). The Nigeria Demographic and Health Survey indicated that among pregnant Nigerian women, only about 64% receive ANC from a qualified healthcare provider in 2003 (Edie et al., 2015).

In Plateau state, women living in Koghum, Jos south tend not to utilize ANC services and practice home delivery by traditional birth attendants, therefore the aim of this study is to assess factors affecting the utilization of ANC services and institutional delivery among women living at Koghum Jos south. This study will inform decisions on strategies targeted at reducing maternal morbidity and mortality.

MATERIALS AND METHODS

Study area

The study was conducted in a rural community at Korghum (Vom), Jos South Local Government Area (LGA) of Plateau state. Plateau state has a population of 3,383,027 million. The State has 17 Local Government Area Councils and is located in the North Central zone of the country. The predominant occupation of its population is agriculture, but a significant proportion of its people engage in mining. There are about 1,000 health facilities in the state; public, private, Faith Based Organization (FBO) owned, which are inclusive of 2 tertiary, 59 secondaries, and 940 PHC facilities. Jos South has 20 wards with a total of 35 Primary Health Care facilities (PHC) organized into 16 wards with an average of 1-2 PHC per ward. Women living in these areas are mostly farmers.

Study design

A community-based cross-sectional study was conducted.

Study population

This study population were women within the age range of 17 to 55 yrs, who were either pregnant or had previous deliveries in the past, currently married or not married and resident in Vom, Jos South LGA.

Women less than 18 yrs of age enrolled into this study were considered emancipated minors.

Sample size

A minimum sample size of 200 was calculated using the Kish and Leslie formula for single proportion. A proportion of 15.4% which is the proportion of women who did not utilize antenatal care services from a study conducted in Uganda (Rajiv et al., 2015), a standard deviate of 1.96 at 95% confidence interval, and 5% precision was used for the sample size calculation.

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Sampling technique

All HHs in Korghum were enumerated and each selected using a systematic random sampling technique, one out of every four households was selected.

Data collection methods

Pre-tested semi-structured questionnaires were interviewer-administered to pregnant women or who had previous deliveries. Data on socio-demographic/economic factors such as age of respondents, religion, marital status, marital setting, wife's occupation, husbands' occupation, wife's educational level, husbands' educational level, family size, family income, the number of children, parity, and health insurance status was collected. Information on the importance of ANC, utilization of ANC services, institutional delivery, attendance at ANC, and reasons for non-utilisation of ANC services was also obtained. ANC services were deemed to have been utilized if at least a respondent had registered for ANC in any health facility and had kept ≥ 4 of her ANC visits appointments before the last delivery. A low educational level was defined as women who had only primary or secondary school level certificate.

Data analysis

Data were analyzed using Epi Info version 3.5.3 (US Centers for Disease Control and Prevention) and Microsoft Excel version 2007. Descriptive summary statistics such as median, minimum, and maximum range were computed for continuous variables and proportions for categorical variables. All variables which showed a significant association with the utilization of ANC services and institutional delivery in the bivariate analysis were included in multiple logistic regression models to assess the effects of individual variables on the utilization of ANC services and institutional delivery at 95% confidence interval (CI).

Ethical approval and consent to participate

Ethical approval for this study was obtained from the Ethical review committee of Plateau State specialist hospital, Jos, Plateau State in collaboration with the Berom Elders council. According to the policy statement regarding enrollment of children less than 18 yrs of age in Research in Nigeria (PS2.1016; Sections B3 and B4), participants that were less than 18 yrs of age were considered "emancipated minors" because, they are legally married with children, independent of their parents, assumed most adult responsibilities, no longer considered to be under the care and control of their parents and could take responsibilities of their own care. A verbal and written informed consent was obtained from the participants. Confidentiality of the information provided by the participants was ensured.

RESULTS

Sample characteristics of the women interviewed

A total of 198 women were included in the analysis. The median age of respondents was 29 years (range: 17 to 55 years). Eighty-seven (43.9%) of the women were aged

between 26 and 35. The majority, 189 (95.5%) women were married, while 191 (96.5%) were in a monogamous union. The majority, 168 (84.8%) had a low educational level, and 186 (93.9%) were unemployed. Of the 198 women, 113 (57.1%) had a family size of >5 persons in a household while 46 (23.2%) had >5 children. Almost all 197 (99.5%) had a monthly family income of >500 naira (Table 1).

The utilization of ANC services among women living at Koghum, Jos South LGA

Overall, 192 (97%) of the women attended ANC at least once during pregnancy. Ninety-three (47.9%) commenced ANC in the second trimester. One hundred and sixteen (58.6%) had more than four ANC visits.

Use of institutional delivery among women living at Koghum, Jos South LGA

A total of 69 (34.8%) had delivered at a healthcare facility while 126 (63.6%) had their last delivery at home by a traditional birth attendant.

Reasons given by women living at Koghum for utilization and non-utilization of ANC service

Out of those that attended ANC, 187 (93.9%) attended for reasons essentially linked to for an assessment of fetal vitality and positioning, 8 (4.1%) for health problems, and 3 (1.5%) for general wellbeing. Out of those that did not attend ANC, 93 (47.0%) reported that they did not attend ANC due to the long distance from their homes (Table 2).

Health care interventions received during ANC consultation

Among healthcare interventions received by women during ANC consultation, the highest intervention received was at least one dose of tetanus toxoid (TT) and the least was receipt of an insecticide-treated net by 74 (37.4%).

Information received by the women during ANC consultation

Of the 198 women interviewed, 191 (97%) women were informed about the progress of their pregnancy, 185 (93.9%) were educated on how to care for their babies after delivery while only 59 (29.8%) of the women

Table 1. Characteristics of the women interviewed at Koghum, Jos South, Plateau State, 2014.

Characteristics		Frequency (n=198)	Percent
Age group (years)	17 - 27	88	44.4
	28-37	71	35.9
	38-45	30	15.2
	46 -55	9	4.5
Marital status	Married	189	95.5
	Separated	6	3.0
	Widow	3	1.5
Marital setting	Monogamy	191	95.5
	Polygamy	7	3.5
Wife's occupation	Employed	12	6.1
	Unemployed	186	93.9
Husband's occupation	Employed	40	20.2
	Unemployed	158	79.8
Wife's educational level	None	60	30.3
	Primary	108	54.5
	Secondary	29	14.6
	Tertiary	1	0.5
Husband's educational level	None	28	14.1
	Primary	106	53.5
	Secondary	56	26.3
	Tertiary	8	4.0
Family size	≤5	85	42.9
	>5	113	57.1
Family income	≤500 naira	1	0.5
	>500 naira	197	99.5
Number of children	≤5	152	78.8
	>5	46	23.2
Parity	1	16	8.1
	2-4	108	54.5
	>4	74	37.4

received information on family planning during ANC attendance.

Factors affecting utilization of ANC services and institutional delivery and influence of health care interventions on the utilization of ANC services

Having partners' consent to attend ANC was associated with the use of ANC services compared to women who had not obtained their partners' consent (odds ratio (COR)

17.8; 95% confidence interval (CI): 2.1 to 63.6). Women from a polygamous union were found to be less likely to utilize ANC services compared to women from a monogamous family (OR 0.1; 95% CI: 0.0 to 0.4). Women who had delivered once were found to be less likely not to utilize ANC services (OR 0.04; 95% CI: 0.0 to 0.4) compared with women who had experienced multiple deliveries. Not having knowledge of the importance of ANC was found to be a factor that influences the use of ANC among women (OR 7.3; 95% CI: 1.4 to 38.6). Having a higher educational level was associated with

Table 2. Utilisation of antenatal care services, institutional delivery, and reasons given for utilization and non-utilization of ANC services among women at Koghum, Jos South, Plateau State, 2014 (N = 198).

Variables		Frequencies (n=198)	Percent
Attended Antenatal Care (ANC)	Yes	6	3.0
	No	192	97.0
Time of the first visit	First trimester	51	26.3
	Second trimester	93	47.9
	Third trimester	50	25.8
Number of ANC visits	<4	82	41.4
	>4	116	58.6
Institutional delivery	Yes	129	65.2
	No	69	34.8
Place of delivery	At home	126	63.6
	Government Hospital	64	32.3
	Local dispensary	3	1.5
	Private Hospital	5	2.5
Who takes your delivery	Community health extension worker	1	0.5
	Doctor	26	13.1
	Midwife	3	1.5
	Nurse	44	27.2
	Traditional birth attendant	124	62.6
Delivery taken by qualified health personnel	Yes	73	36.9
	No	125	63.1
Reasons for attending ANC	Health problem	8	4.1
	For assessment of fetal vitality and positioning	187	93.9
	For general wellbeing	3	1.5
Reasons for not attending ANC	Lack of financial means		
	Distance	85	42.9
	Lack of partner's consent	93	47.0
	State of good health	2	1.0
	Lack of time	2	1.0
	Lack of financial means	16	8.1

health facility-based delivery (OR: 0.3; 95% CI: 0.1 to 0.7). The age of respondents, marital status, respondents' occupation, husband's occupation, husband's educational level, family size and registration with health insurance scheme were factors not found to have a statistically significant association with the utilization of ANC services. However, healthcare interventions found to influence the use of ANC among women were iron tablets (OR 23.5; 95% CI: 4.0 to 138.8) and counseling and screening for HIV (OR 8.1; 95% CI: 1.54 to 43.0) (Table 3).

Independent risk factors for utilization of ANC were partners' consent (adjusted odds ratio (AOR) 11.5; 95%

CI 1.6 to 82.3) and knowledge on the importance of ANC (aOR7.4; 95% CI 1.4 to 38.6). Pregnant women in polygamous unions were less likely to use ANC (aOR 0.1; 95% CI 0.0 to 0.4). Being a woman with a lower educational status was associated with traditional birth attendant (TBA), assisted home delivery (aOR0.3; 95% CI 0.1 to 0.6) (Table 4).

DISCUSSION

From this study, the proportion of women who received

Table 3. Factors associated with utilization of antenatal care services and institutional delivery among women at Koghum, Jos South, Plateau State.

Variable	Utilization of ANC services		OR* (95% CI*)	Institutional delivery		OR (95% CI*)	
	Yes (n(%))	No (n (%))		Yes (n (%))	No (n (%))		
Age group (years)	17 -27	84(95.4)	4(4.6)	1.00 referent	34(39.1)	54(60.9)	1.00 referent
	28-37	71(100.0)	0(0.0)	undefined	24(33.8)	47(66.2)	0.81(0.40-1.64)
	38 -45	30(100)	0(0.0)	Undefined	8(26.7)	22(73.3)	0.58(0.21-1.56)
	46 -55	7(77.8)	2(22.2)	0.17(0.02-1.59)	3(33.3)	6(66.7)	0.79(0.15-3.93)
Marital status	Currently married	6(3.2)	183(96.8)	Undefined	64(33.9)	125(66.1)	2.44(0.63-9.41)
	Not currently married	0(0.0)	9(100.0)		5(55.6)	4(44.4)	
Marital setting	Monogamy	187(97.9)	4(2.1)	0.05(0.008-0.36)	123(64.4)	68(35.6)	0.31(0.03-2.56)
	Polygamous	5(71.4)	2(28.6)		6(85.7)	1(14.3)	
Wife's occupation	Employed	11(91.7)	1(8.3)	3.33(0.35-30.66)	5(41.7)	7(58.3)	0.73(0.22-2.41)
	Unemployed	181(97.3)	5(2.7)		122(65.6)	64(34.4)	
Husband's occupation	Employed	39(37.5)	1(2.5)	0.78(0.09-6.91)	11(27.5)	29(72.5)	1.52(0.71-3.30)
	Unemployed	153(96.8)	5(3.2)		58(36.7)	100(63.3)	
Wife educational level	High educational level	29(26.7)	1(3.3)	1.12(0.13-9.98)	18(60.0)	12(40.0)	0.29(0.13-0.65)
	Low educational level	163(97.0)	5(3.0)		51(30.4)	117(69.6)	
Husband educational level	High educational level	61(95.3)	3(4.7)	2.15(0.42-10.95)	24(37.5)	40(62.5)	0.84(0.45-1.56)
	Low educational level	131(97.8)	2(2.2)		45(33.6)	89(66.4)	
Family size	≤5	81(95.3)	4(4.7)	2.74(0.49-15.3)	33(38.8)	52(61.2)	0.73(0.41-1.33)
	>5	111(98.2)	2(1.8)		36(31.9)	77(31.9)	
Number of children	≤5	147(96.7)	5(3.3)	1.53(0.17-13.44)	53(34.9)	99(65.1)	0.99(0.50-1.99)
	>5	45(97.3)	1(2.2)		16(34.8)	30(65.2)	
Partner's consent	Yes	177(98.3)	3(1.7))	11.8(1.70-82.75)	63(35.0)	117(65.0)	10.71(0.24-2.23)
	No	15(83.3)	3(16.7)		6(33.3)	12(66.7)	
Parity	1	23(85.2)	4(14.8)	0.04(0.00-0.41)	8(50.0)	8(50.0)	1.61(0.52-4.92)
	2-4	145(99.3)	1(0.7)	1.00 referent*	40(37.0)	68(63.0)	0.94(0.57-1.58)
	>4	24(96.0)	1(4.00)	0.17(0.00-6.30)	76(38.4)	122(61.6)	1.00 referent*
On NHIS scheme	Yes	61(98.4)	1(1.6)	2.32(0.27-20.36)	44 (32.4)	92(67.6)	0.71(0.36-1.38)

Table 3. Cont'd

	No	131(96.3)	5(3.7)		25 (40.3)	37(59.7)	
Knowledge of ANC	Yes	169(98.3)	3(1.7)	7.34(1.40-38.60)	63(36.6)	109(63.4)	1.93(0.68-5.69)
	No	23(88.5)	3(11.5)		6(23.1)	20(76.9)	
Distance	≤5km	127(98.4)	2(1.6)	0.26(0.05-1.43)	44(34.1)	85(65.9)	0.95(0.49-1.84)
	>5km	65(94.2)	4(5.8)		25(36.2)	44(63.8)	

*Odds ratio, Confidence Interval; *referent = Baseline variable.

one or more antenatal care was 97%. ANC attendance of 97% is, however, higher than the national figures, which showed that 58% of pregnant women in Nigeria attend ANC at least once, and it was also found to be higher than 36.3% from a study conducted in Funtua, Katsina state (Edie et al., 2015).

It is worth noting that adequate ANC visits during pregnancy significantly influenced delivery at the health facility by a skilled birth attendant, and this explains why only 65.2% of the respondents had their deliveries at the health facility. The majority of the women did not have their deliveries at the health facilities, and this corresponds with findings in a study conducted in Indonesia (Agus and Horiuchi, 2012). The proportion of women (65.2%) who did not deliver at the health facilities was lower than the proportion of 93.8% reported in a study conducted in the Republic of Congo (Abel et al., 2012). The majority of the women, who did not deliver at health facilities may be due to ignorant of increased pregnancy-related complications and long distance from health facility as many complained their places of residence were more than 5 km from health facilities. These findings are similar to findings from a study conducted in Funtua, Katsina state (Edie et al., 2015).

The World Health Organization recommended

that pregnant women should commence ANC during the first trimester of pregnancy and a minimum level of care to be four visits throughout the pregnancy (Zeine, 2010). In this study, we found that more than half of the respondents (47.9%) had their first ANC during the second trimester. These findings contradict findings from a study conducted in Funtua, Katsina State, who reported that more than half (62.1%) of the respondents had their first ANC during the first trimester (6) and also contradicts with findings from a study conducted in Nepal (Ramesh, 2013).

Health care's interventions found to influence the use of ANC among women were iron tablets and counseling and screening for HIV. These findings are consistent with findings from a study conducted in Democratic of Congo (Abel et al., 2012)

The commonest information received by the women was about the progress of their pregnancy. Lack of adequate information by skilled personnel to pregnant women may serve as a barrier to increasing delivery at the health facility. A study in rural Tanzania revealed that women's preference for home birth and lack of planning for facility childbirth are reinforced by the failure of the healthcare provider to communicate consistently the importance of skilled childbirth and immediate postpartum care during routine

ANC visits (Adewemimo et al., 2014).

Our study also revealed reasons for utilization and non-utilization of antenatal care services (ANC). Reasons reported by respondents for utilization of ANC included for assessment of fetal vitality and positioning, health problems, and general wellbeing. These findings are consistent with findings from a study conducted in Democratic Republic of Congo (Abel et al., 2012). Reasons reported for utilization antenatal care services included long distance from a health facility, lack of financial means, lack of partner's consent, the state of good health and lack of time and this findings are similar to findings from a study conducted in the Democratic Republic of Congo (Abel et al., 2012). Affordability of maternal health service enhances utilization of antenatal care services. A study in Afghanistan found that women residing in a community with free maternal health services are more likely to deliver in a facility than women in the catchment area of a fee-charging facility (Adewemimo et al., 2014)

Our study found partners' consent, polygamous union, and knowledge on the importance of ANC as factors associated with the use of ANC services. This finding correlates with findings from a study conducted in Funtua, Katsina (Adewemimo et al., 2014; Hossain and Hoque, 2015). Having a higher educational level was

Table 4. Independent factors associated with utilization of antenatal care services and institutional delivery and influence of health interventions on use of antenatal care among women at Koghum, Jos south, Plateau state.

Variable		*AOR	95% *CI	p-value
Utilization of ANC	Marital setting (polygamous/monogamy)	0.05	0.008-0.36	0.0027
	Partners consent (Yes/No)	11.8	2.19-63.62	0.004
	Parity	0.04	0.00-0.40	0.001
Knowledge of the importance of ANC (Yes/No)		7.35	1.40-38.6	0.02
Institutional delivery	Wife's educational level(High/Low)	0.28	0.12-0.64	0.001
Health care interventions	Received iron tablets	23.5	3.87-137.5	<0.001
	Counseled and screened for HIV	8.14	1.50-42.95	0.0024

*Adjusted odds ratio, *Confidence Interval

associated with health facility-based delivery and is consistent with the findings from a study conducted in Bangladesh and Ibadan (Dairo, 2010; Zeine, 2010). Women with high educational level were found to be more likely to utilize antenatal care services and deliver at the health facility. Therefore, the education of the community, including the girl-child, could decrease maternal and neonatal mortality in the long-term.

This study had few limitations. First, the study was conducted with a small sample size. Second, a researcher-developed questionnaire with minimal reliability and validity testing was used for the study. Third, there were issues of recall bias among respondents. However, we do not feel this bias is likely to change the conclusion.

CONCLUSIONS AND RECOMMENDATIONS

In conclusion, partners' consent, polygamous union, and knowledge on the importance of antenatal care were factors found to be associated with utilization of antenatal care services. Having low educational level was also found to be associated with health facility-based delivery. The findings from this study will assist to inform decisions of policymakers and stakeholders in program planning and selection of appropriate interventions on increasing antenatal care utilization and health facility-based delivery. Plateau State Government through Jos South Local Government authorities should plan for outreaches and integrated maternal and child health programs via which the women in the community can be educated on the benefits of ANC utilization and health facility-based delivery.

CONFLICT OF INTERESTS

The authors declare that they have no competing interest.

ABBREVIATIONS

AFENET: African Field Epidemiology Network; ANC: Antenatal Care; aOR: adjusted odds ratio; CI: Confidence Interval; HH: Household; HIV: Human Immuno deficient Virus; IPTp: Intermittent Preventive Treatment for Malaria during Pregnancy; LGA: Local Government Area; NHIS: National Health Insurance Scheme; OR: Odds Ratio; PHC: Primary Health Care; TBA: Traditional Birth Attendance; TT: Tetanus Toxoid; WHO: World Health Organization

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