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Effect of Perception and Free Maternal Health Services on Antenatal Care Facilities Utilization in Selected Rural and Semi-Urban Communities of Ondo State, Nigeria

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Authors' contributions

This work was carried out in collaboration between all authors. Author FAA conceived the study, wrote introduction, actively involved in data collection and contributed to results writing. Author AMO reviewed relevant literatures, contributed to the introduction section and did repeated editorial review of the manuscript. Author AFF prepared the study design, analysed the data and wrote the results while author ASA was involved in methodology section and contributed to data analysis. All authors wrote the discussions section and reviewed the manuscript. All authors read and approved the final manuscript.

Research Article

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ABSTRACT

Aims: We aimed at assessing perception and effect of free maternal health services on the utilization of ANC services among women of child bearing age.

Study Design: A cross-sectional study involving 460 women aged 15-49 years who were currently pregnant or had their most recent birth within the previous five years prior the survey was conducted using a two-stage sampling technique.

Place of Study: Rural and semi-urban communities in Ondo State, Nigeria.

Methodology: We administered semi-structured interviewer questionnaire. Knowledge

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was classified as good if knowledge score is higher or equal to the mean score obtained from this study and poor if otherwise. A 5-point likert scale was used to measure respondents' perception. Respondents with scores less than the mean perception score from this study were classified as having negative perception and positive if otherwise. Descriptive statistics, Chi-square tests and logistic regression model were used for data analysis and significance level was set at $P = .05$.

Results: Mean age, knowledge score and perception score of the respondents were 29.8 ± 7.3 years, 6.0 ± 1.2 and 29.6 ± 6.0 respectively. Overall, 95.4% had utilized ANC facilities. Highest proportions (55.0%) of those utilizing ANC were aged 20-30 years. About two fifth (40.8%) reported that free ANC services was the main reason for choosing public ANC facilities. Almost two-third (63.0%) of the respondents had good knowledge of ANC, while about 35.9% had positive perception towards free ANC services. Higher utilization of ANC services was observed among married or cohabiting women than the singles and widows ($P = .04$). Logistic regression showed that Respondents' knowledge was significantly influenced by respondents' occupation, previous pregnancies, and religion.

Conclusion: Perception of women on free ANC utilization in the study area was negative although free ANC program instituted by government across the state enhanced ANC utilization. The government should sustain the policy on free maternal health services.

Keywords: Antenatal care facilities; utilization; free health programme; perception.

1. INTRODUCTION

Antenatal care (ANC) has long been recognized as an important intervention step in preventing maternal morbidity and mortality during pregnancy and in the post-partum period. It is assumed by many maternal and child health care services providers that ANC improves the general health condition of both mother and child during pregnancy, delivery and the puerperium. However, there are limited scientific studies showing this association, and where this exist, it only shows some aspect of the content of ANC as a useful screening tool in the early detection of high risk pregnancy-related health conditions [1-3]. However, despite these scientific evidences of ANC as a useful tool in improving maternal health, some pregnant women do not utilize it [4,5].

The ANC remains one of the pillars of the safe motherhood Initiative and a core strategy in the Millennium Development Goals of preventing child mortality and improving maternal health. One of the purposes of antenatal care is to establish a relationship between a pregnant woman and health care providers. This will create avenue for positive interaction which enables the provider to identify risks that are amenable to interventions. Benefits of ANC may be more effective when its services are accessed early in pregnancy. Earlier research has established that timely and adequate prenatal care is effective in reducing the likelihood of low birth weight and other adverse pregnancy outcomes [4-6].

The proportion of women aged 15-49 who utilized ANC services in Nigeria stands at 58% with a wide range of disparity between North-West 31.1% and South-West 87.7%[7]. Studies done in Japan show that only about 46.1% of women aged 15-49 years utilized ANC[8], while women reported having received antenatal care from a provider for 48% of all live and still births in Bangladesh [9]. A national survey in Nigeria derived from the 2005 National

HIV/AIDS and Reproductive Health Survey (NARHS) show that about three-fifths (60.3%) of the respondents used antenatal services at least once during their most recent pregnancy [10].

World health organization (WHO) recommends at least four visits to antenatal care facilities throughout pregnancy. Evidence has shown that more than four visits are only recommended in case of complication [11,12]. Utilization of health facilities are determined by many factors. Maternal age, parity, income, standard of living of households, ANC users fees and travel distance to ante natal care provider are the common economic factors that have been cited by previous researchers [13-15]. Previous studies showed that the likelihood that a household will utilize health facilities is a function of its socioeconomic, demographic and supply variables and that substantial difference exist in utilization pattern by income class. In addition, these studies showed that "Households in the highest income quintile are approximately twice more likely to utilize private hospital services than those in the lowest, *ceteris paribus* [13-15].

Aside the socioeconomic factors influencing ANC, it is often believed that pregnant women's knowledge and perception of importance of ANC determines its utilization. It was also reported that educated couples are more likely to switch from their cultural and religious ideology of leaving most events in their lives to fate and supernatural belief[16]. For instance, in Indonesia, it was demonstrated that improvement in ANC knowledge was significantly influenced by respondents' levels of education [17].

Radio and television access exposure were also shown to influence ANC as found in a study conducted in Bangladesh [18]. Also in Uganda, a study reported that ANC utilization was mainly affected by distance and lack of knowledge of the importance of ANC [19]. Similar study carried out in Islamabad, Pakistan[20] revealed that of the women who did not avail themselves of ANC, about three quarter cited ignorance of the importance of antenatal care as reason why they didn't utilize ANC.

To a great extent, knowledge and attitude determines the level of practice ANC. This was shown by a study in Kolkata (Indian) where nearly two third of the study group had either good or excellent knowledge, convenience, utilization and satisfaction of maternal health services. The study further showed that almost two thirds (64.25%) of the women studied utilized ANC facilities because of the good knowledge demonstrated by them [21]. On the other hand, knowledge about antenatal care was found to be better among women who utilized antenatal care as compared to women who did not receive [22]. The implication of these studies is that knowledge improves utilization of ANC services and vice versa.

A Nicaragua study also found that women utilization of prenatal and delivery services is influenced by communal and individual perception regarding maternal care[23]. Women perception that facility-based care provides a safe environment for receiving care evolved from the quality of care they received and delivery outcome from previous pregnancies. Many women who experienced complications from previous birth or low parity had an increased fear and awareness of the risk involved in failing to seek care and thus sought care to avoid complications [23]. Therefore, perception of ANC and its utilization can be influenced by quality of care and previous pregnancy outcome.

Nigeria is ranked as one of the countries with the highest maternal mortality ratio in the world, with current figure of 545 per100,000 live births and with a wide range of geographical disparity between 165 per100,000 live births in South West to 1,549 per100,000 live births in

North East[24]. Published data on the effect of free maternal services and perception on ANC facilities utilization in Ondo state in general and in Okitipupa Local Government area in particular is lacking and this study is intended to provide such data. In view of the national need to meeting the Millennium Developmental Goal-4 (Reduce child mortality) and Goal-5 (Improve maternal health) in 2015, and also in line with global aspiration for attainment of optimal reproductive health, a good understanding of pregnant women's perception of ANC and other factors which influence the utilization of ANC facilities is germane. It is also imperative to know pregnant women attitude towards utilization of free health programme been offered in Ondo State. Therefore, the study is intended to explore the influence of free health programme and other factors on ANC facilities utilization in communities in Okitipupa Local Government Area, Ondo State.

2. METHODOLOGIES

This is a descriptive cross-sectional, community-based study conducted among women of reproductive age (15-49 years) in some selected rural and semi-urban communities in Okitipupa Local Government Area (LGA), Ondo State. A pre-tested structured interviewer administered questionnaire was used to obtain the relevant data. Multistage sampling procedures were used to select eligible respondents.

A semi-urban community was defined as having a population greater than 30,000 and having facilities like potable water, electricity, telephone services, secondary schools, banks, good intra-city roads network, while rural towns are those that have not met the criteria listed above. Two semi-urban communities (Ode-Aye and Okitipupa) and three rural communities Ikoya, Iju-odo and Erinje were randomly selected using balloting. All houses having the eligible respondents in each selected town were listed using the 2006 National Population Census numbering system. Using sampling proportionate to size, 120 houses were selected from each of the semi-urban communities and 80 houses from each of the rural communities. Thereafter, a systematic random sampling method was used to select the houses. However, if a house has more than one eligible respondent, the respondent was selected using lottery method.

2.1 Inclusion Criteria

All selected women who had at least a baby delivery in the 5 years prior the surveyor currently pregnant were enrolled and interviewed.

2.2 Measurement of the Dependent Variables

Knowledge scores were based on 8 parameters, using Nigeria Standard Treatment Guide (2007). These were; (1) Assessment of risk in pregnancy; (2) Birth preparedness; (3) Physical examination; (4) Urine examination; (5) Blood pressure measurement; (6) Detecting fetal and maternal abnormalities; (7) Drugs for fetal and maternal wellbeing; (8) Immunization. Respondents were scored based on their ability to correctly state any of the above 8 parameters as either a purpose or service rendered in ANC visit. Each correct response to any of the parameter was scored 1 mark and each wrong response had 0 score. Knowledge score was grouped based on the mean score.

Also, a five-point Likert scale was used to measure respondents' perception. Mean perception score was measured based on the aggregate score. Respondents with scores

less than the mean were classified as having negative perception, while those with scores greater than the mean were classified as having positive perception. Maximum obtainable attitudinal score was 40.

2.3 Data Collection and Analysis

Descriptive statistics such as percentage or proportion were used to describe the quantitative/categorical variables. The Chi-square test was used for the bivariate analysis and the multivariate analysis was carried out using multiple logistic regression model while p-value less than 0.05 were considered to be statistically significant.

3. RESULTS

The mean age of the respondents was 29.8 ± 7.3 with majority being in the 20-29 (46.3%) age group, while the least represented age group was ages 15-19 years (6.5%). Majority (89.3%) of the respondents were presently married. Yoruba was the predominant ethnic group among the respondents representing 84.6%. The respondents were mainly Christians (87.6%). About a third of the respondents (32.0%) were traders, the farmers constituted 17.6%, while the business women constituted about a quarter (24.8%) of the respondents. A close proportion (37.6% & 34.3%) of the respondents attained secondary and primary education respectively compared with tertiary 76 (16.5%) and those with no formal education 53 (11.5%) as shown in Table 1.

3.1 The Knowledge of Respondents with Regards to Antenatal Care (ANC)

Knowledge of ANC shows that 98.0% of the respondents were aware of the term ANC, while almost half of the respondents got the information on ANC from health workers (45.9%).

The mean knowledge score was 5.99 ± 1.2 and ranged from 0-8. Those with scores less than the mean (i.e. < 6.0) were classified as having poor knowledge, while those with scores greater than or equal to the mean (≥ 6.0) were classified as having good knowledge. The responses to the knowledge-based questions on ANC were generally good as shown in Table 2. Majority of them had good knowledge on the purposes and services of ANC.

3.2 Respondents' Perception of Antenatal Care

Almost all the respondents (98.5%) believe that ANC improves their health and that of their unborn child, while 94.4% believe that ANC improves pregnancy outcome. A greater proportion (96.2%) of the respondents believes that ANC prevents delivery complications. About 53.5% of the respondent disagree that ANC is not very useful to multiparous women. However, about one third (30.9%) of the respondent disagreed that women only registered for the purpose of where to deliver, while about three-quarter (74.6%) agreed ANC can reduce morbidity and mortality in women. On whether ANC is necessary for purpose of treatment of minor illness during pregnancy; over three quarter (84.4%) of the respondent agreed to the query.

Table 1. Socio-demographic characteristics of respondents

Characteristics	Frequency n (%)
Location	
Urban	222(48.3)
Rural	238(51.7)
Age	Mean= 29.8±7.3
15-19	30(6.5)
20-29	213(46.3)
30-39	165(35.9)
40 & Above	52(11.3)
Marital Status	
Single	7(1.5)
Married	411(89.3)
Separated	8(1.7)
Divorced	19(4.1)
Cohabiting	6(1.3)
Widow	9(2.0)
Tribe	
Edo	32(7.0)
Hausa	9(2.0)
Igbo	30(6.5)
Yoruba	389(84.6)
Religion	
Christianity	403(87.6)
Islam	42(9.1)
Traditional	14(3.0)
Educational qualifications	
No formal education	53(11.5)
Primary	158(34.3)
Secondary	173(37.6)
Tertiary	76(16.5)
Occupation	
Trading	147(32.0)
Farming	81(17.6)
Business	114(24.8)
Civil servant	63(13.7)
Unemployed	44(9.5)
Others	11(2.4)

Table 2. Knowledge of ANC utilization

Variable	Yes n (%)	No n (%)
Do you know about the followings in ANC?		
Assessment of risk in pregnancy	395(85.9)	65 (14..1)
Birth preparedness	290 (63.0)	170 (37.0)
Physical examination	241 (52.4)	219 (47.6)
Urine examination	351 (76.3)	109 (23.7)
Blood pressure measurement	453 (98.5)	7 (1.50)
Detecting fetal and maternal abnormality	288 (62.6)	172 (37.4)
Drugs for fetal and maternal wellbeing	438 (93.0)	22 (7.0)
Immunization	320 (69.6)	140 (30.4)
Proportion of Poor Knowledge	170 (37.0)	
Proportion of Good Knowledge	290 (63.0)	
Mean Knowledge Score	5.99 ± 1.2	

Table 3. Perception of antenatal care activities

	Strongly agree	Agree	Don't know	Disagree	Strongly disagree
ANC is very important to the health of pregnant women and their unborn child	274(60.8)	170(37.7)	1 (0.2)	2(0.4)	4(0.9)
ANC Improves pregnancy outcome	261(58.0)	164(36.4)	8 (1.8)	9(2.0)	8(1.8)
ANC prevents delivery complications	267(59.3)	166(36.9)	3(0.7)	4(0.9)	10(2.2)
ANC is not very useful to multiparous women	13(2.9)	108(23.9)	89(19.7)	127(28.2)	114(25.3)
You register for ANC only for the purpose of where to deliver	99(22.0)	189(42.0)	23(5.1)	95(21.1)	44(9.8)
ANC is necessary for purpose of treatment of minor illnesses during pregnancy	177(39.3)	203(45.1)	3(0.7)	37(8.2)	30(6.7)
ANC can reduce morbidity and mortality in women	236(52.4)	100 22.2)	36(8.0)	73(16.2)	5(1.1)

3.3 Practice of Antenatal Care

As shown in Figure 1, over four fifth of the respondents (95.4%), utilized ANC during their last pregnancy.

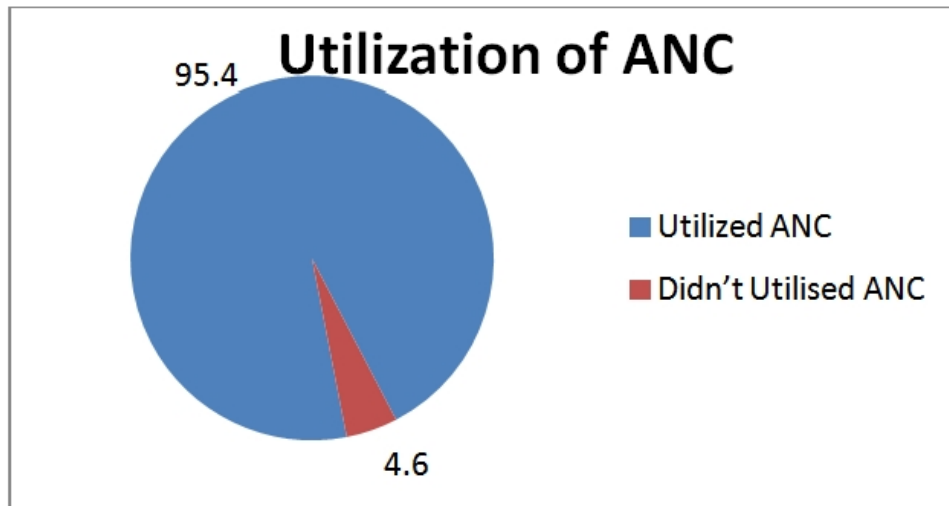


Figure 1. Pie chart showing respondents utilization of ANC during their last pregnancy

3.4 Demographic Characteristics of Respondents and the Utilization of ANC

Age was found to be associated with the utilization of ANC but women aged 20-29 were the highest numbers of users (96.7%) when compared with the other age groups ($X^2= 25.928$, 3df, $P < .001$). Also attaining any level of education was significantly associated with ANC utilization as those with secondary education has the highest proportion of ANC utilization in their last pregnancy(96.5%) as compared with those without formal education ($X^2= 7.925$, df, $P = .048$). In addition, Marital status was significantly associated with the utilization of ANC as those who were married had the highest proportion 394 (96.1%) of users when compared with the singles' ($x^2 = 16.77$, 5df, $P = .005$).

3.5 Relationship between Respondents' Knowledge and Perception of ANC on Practice of ANC

Previous delivery of a healthy baby was the factor found to have the strongest influence on the utilization of any ANC facilities, and also attitude ($X^2 = 9.806$, 1df, $P = .02$) and husband educational status ($X^2 = 7.824$, 3df, $P = .05$). Knowledge of ANC was not found to be associated with ANC utilization. This is shown in Table 4 below. Table 5 also showed the relationship between respondents' socio-demographic factors and their utilization of ANC facilities.

Table 4. Association between respondents' knowledge and perception of ANC and the utilization of any ANC facilities

Characteristics	% of 460	Received ANC in the last pregnancy?		X ² , df	p-value
		Yes	No		
Previous delivery of a healthy baby	95.2	385 (87.9)	53 (12.1)	51.229,1	.00
Knowledge					
Poor knowledge	37.0	165 (97.6)	4 (2.4)	2.988,1	.08
Good knowledge	63.0	273 (94.1)	17(5.9)		
Perception					
Positive Perception	35.9	146(91.2)	14(8.8)	9.806,1	.02
Negative Perception	64.1	292 (97.7)	7(2.3)		

Table 5. Relationship between respondents' demographic factors and their utilization of ANC facilities

Characteristics	Received ANC in the last pregnancy?		X ² , Df	p-value
	Yes	No		
Age (years)			25.928,3	.000
< 20	23 (76.7)	7 (23.3)		
20-29	206 (96.7)	7 (3.3)		
30-39	159 (97.0)	5 (3.0)		
40 and above	50 (96.2)	2(3.8)		
Educational status			7.925, 3	.048
None	47 (88.7)	6 (11.3)		
Primary	150 (94.9)	8 (5.1)		
Secondary	166 (96.5)	6 (3.5)		
Tertiary	75 (98.7)	1(1.3)		
Marital status			16.769,5	.005
Married	394 (96.1)	16(3.9)		
Single	5 (71.4)	2(28.6)		
Divorced	18 (94.7)	1(5.3)		
Widow	7 (77.8)	2 (22.2)		
Separated	8 (100.0)	0(0.0)		
Cohabiting	6 (100.0)	0(0.0)		
Occupation				
Trading	139 (94.6)	8 (5.4)		
Farming	80 (98.8)	1 (1.2)		
Business	109 (95.6)	5 (4.4)		
Civil servant	62 (98.4)	1 (1.6)		
Unemployed	39 (90.7)	4 (9.3)		
Others	9 (81.8)	2(18.2)		
Husband Educational status				
None	39 (86.6)	5 (11.4)		
Primary	96 (93.2)	7(6.8)		
Secondary	175 (96.7)	6(3.3)		
Tertiary	124 (91.6)	3(2.4)		

3.6 Factors Affecting Respondents Perception and Knowledge of ANC

Respondents' knowledge is significantly influenced by respondents' type of occupation, number of previous pregnancy, religion practiced, husband's occupation and educational attainment (p<.001). Respondents who were civil servants were two and half times more likely to have a good knowledge of ANC than their counterparts who were traders. Respondents whose husband had no education were about eleven times more likely to have good knowledge than those whose husband had tertiary education. Also respondents whose husbands were civil servants and farmers were about twice more likely and thrice less likely respectively to have good knowledge of ANC. Educational status of respondents, their occupation, number of previous pregnancies and whether receive ANC or not significantly affects their perceptions of ANC. Respondents who had received ANC services were about 26 times more likely to have positive perception of ANC than those who had not (p<.001). Uneducated respondents were over twelve times more likely than respondents who had tertiary education to have positive perception of ANC services (Table 6).

Table 6. Effects of socio-demographic variables on respondents' knowledge and perception of ANC and the utilization of any ANC facilities

Characteristics	Knowledge Aor(95%CI)	p-value	Perception AOR(95%CI)	p-value
Educational status				
None	--	--	12.30(3.91-38.8)	.00
Primary	--	--	4.80(1.79-12.8)	.00
Secondary	--	--	3.74(1.50-9.28)	.00
Tertiary	--	--	Ref	
Occupation				
Trading	Ref		Ref	
Farming	1.13(0.57-2.23)	.72	0.55(0.27-1.09)	.08
Business	0.71(0.39-1.32)	.28	1.51(0.84-2.70)	.17
Civil servant	2.58(1.16-5.70)	.02	2.51(1.01-6.30)	.04
Unemployed	0.70(0.30-1.65)	.41	1.95(0.85-4.48)	.12
Others	5.02(0.47-53.2)	.18	0.42(0.05-3.68)	.44
Husband educational status				
None	11.4(3.81-34.2)	.00	--	--
Primary	10.1(4.13-24.7)	.00	--	--
Secondary	6.87(3.23-14.6)	.00	--	--
Tertiary	Ref			
Husband Occupation				
Trading	Ref			
Trading	0.36(0.16-0.82)	.01	--	--
Farming	0.82(0.35-1.93)	.66	--	--
Business	2.34(0.86-6.39)	.09	--	--
Civil servant	2.08(0.83-5.21)	.12	--	--
Unemployed	6.60(0.55-79.5)	.14	--	--
Others				
Religion				
Christianity	Ref			
Islam	0.83(0.38-1.84)	.65	--	--

Traditional	8.18(1.09-61.6)	.04	--	--
No of Previous Pregnancy				
Once	1.10(0.42-2.86)	.85	3.12(1.41-6.91)	.00
Twice	3.46(1.62-7.41)	.00	1.36(0.71-2.62)	.35
Thrice	2.48(1.12-5.28)	.02	1.17(0.59-2.33)	.64
Four times	1.24(0.59-2.46)	.61	0.98(0.49-1.96)	.96
Above four times	Ref			
Ever received ANC				
No	--	--	Ref	
Yes	--	--	26.2(3.13-218.9)	.00

3.7 Types of ANC facilities Utilized (Public and Private)

In Table 7, three quarter (75%) of the respondents utilized public ANC health facilities (general/state specialist hospital and health Centre's), while only one quarter utilized other facilities like private hospitals, home/birth attendants and faith-based organizations in decreasing order. Very few women (1.5%) did not utilize any ANC facility.

Table 7. Types of ANC facilities utilized (public and private)

ANC Facilities utilized	Frequency (%)
General/State Specialist Hospital	200 (43.5)
Health Centers	145(31.5)
Private Hospital	74 (16.1)
Faith Based Organization (churches/mission homes and mosque)	10 (2.2)
Home/Birth attendants	24 (5.2)
None	7 (1.5)
Total	460

3.8 Main Reason for Utilizing Public ANC

About 41% of the respondent stated that Ondo State free health programme for pregnant women was the single reason why they utilized public health facilities, followed distantly by satisfactory treatment of illnesses during pregnancy (Table 8).

3.9 Factors Affecting Utilization of ANC facilities

In Table 9, we showed the proportions of respondents who would consider the different reasons before making a choice of ANC facility to be used. Majority (85.2%) of the respondents claimed that previous delivery of a healthy baby is a factor they would consider for utilizing any ANC, followed by availability of immunization services (85.0%), while only 53.6% would consider "husband's instruction" as the reason for choosing any ANC (12.7%),

Table 8. Respondents' Single reason for using public ANC facilities

Single reason for using public ANC facilities	Frequency	%
Free Health for pregnant women	161	40.8
Satisfactory treatment of illness	50	12.7
Health education during ANC visit	37	9.4
Previous delivery of a healthy baby	27	6.8
Adequate number of health workers	25	6.3
Availability of immunizations	24	6.1
Husband instructions	12	3.0
Politeness of health workers	11	2.8
Availability of family planning services	10	2.5
Avail. of post natal services	10	2.5
Advocacies by health workers	9	2.3
Facility is supernaturally endowed	6	1.5
Short distance to house	6	1.5
Beauty/cleanliness of ANC facility	5	1.3
Propaganda by political office holders	2	0.5
Total	395	100.0

Table 9. Reasons for utilizing any ANC facilities

Reasons	Frequency	%
Previous delivery of a healthy baby	392	85.2
Availability of immunization services	390	85.0
Adequate numbers of nurses/midwives	382	83.2
Satisfactory treatment of illness in pregnancy	370	80.8
Politeness of health workers	348	75.5
Postnatal clinic availability	345	75.3
Adequate numbers of doctors	343	74.7
Health education	333	72.5
Beauty and cleanliness of health facilities	330	72.1
Advocacy of health workers	308	67.1
Family planning clinic availability	268	58.4
Husband instruction	246	53.6

3.10 Factors Influencing Choice of either Public or Private Health Facilities.

The respondents' husband's educational status was significantly associated with the type of ANC facilities utilized ($X^2=11.344$, 3df, $P= .01$), while knowledge was not found to be associated with the type of facilities utilized. In other words, the preference to use either public health facilities or any other type was not significantly associated with knowledge ($\chi^2 =$

0.156, 1df, $P = .69$). Attitude was also not found to be associated with the type of facilities utilized ($\chi^2 = 0.312$, 1df, $P = .31$), (Table 10).

Table 10. Factors influencing choice of either public or private health facilities.

Variable	Place of ANC utilization		X ²	P-value
	Public health facilities	Other places		
Respondents' educational qualifications				
No formal education	37 (69.8)	16 (30.2)	7.307,3	0.06
Primary education	111(70.3)	47 (29.7)		
Secondary	132(76.3)	41 (23.7)		
Tertiary	65 (85.5)	11 (14.5)		
Husband's educational qualifications				
No formal education	30 (68.2)	14 (31.8)	11.344,3	0.01
Primary	75 (72.8)	28(27.2)		
Secondary	128 (70.7)	53 (29.3)		
Tertiary	110(85.9)	18(14.1)		
Respondent marital status				
Married	313 (76.2)	98(23.8)	3.498,1	0.06
Not married	32(64.0)	18 (36.0)		
Knowledge				
Poor knowledge	129 (75.9)	41 (24.1)	0.156,1	0.69
Good knowledge	216(74.2)	75(25.8)		
Perception				
Negative Perception	116 (72.0)	45 (28.0)	1.021,1	0.31
Positive Perception	229 (76.3)	71(23.7)		

4. DISCUSSION

Our study showed a high usage of ANC facilities (95.4%). We found that the single main reason why respondents patronize a public ANC facility is the newly introduced health services in the study area. Almost two-thirds of the respondents had good knowledge of ANC while less than half had positive perception of ANC. Factors influencing good knowledge of ANC include respondents number of previous deliveries, occupation, religion and their husband's occupation and level of education.

The mean age of respondents who were either currently pregnant or had had at least one child delivery within the last five years was 29.8 ± 7.3 years. This is similar to a study done in Islamabad where it was found that the mean age of women was 29.6 ± 7.1 [20]. We found that ANC use increased with age. This is similar to reports of Nigeria Demographic and Health Survey (NDHS), 2008 which reported that "Mother's age at birth is related to use of professional antenatal care services, increasing from 45 % among women under age 20 at the time of the birth to 61 % among women age 20-34, and then declined to 55% among older mothers age 35-49"[24].

The present study showed that the knowledge of the respondent on the awareness, purpose and services of ANC was generally good (63.0%). This finding is in agreement with a study in Kolkata, Indian where over 60.0% of women have good knowledge of ANC[21]. In our study, health workers, constituted the greatest source of information on ANC 45.9%,

followed by news media, 19.7%. The impact of news media has assumed this relative importance as a source of ANC information because it was a major channel used by Ondo State political office holders to propagate the free ANC services in their public health facilities. Majority of the respondents indicated that ANC is meant to assess the health of pregnant women and their unborn child. Most respondent explained correctly that their blood pressures, weight, temperature and laboratory test were routinely done for them including physical examinations to determine the health status of their un-born baby. Some mentioned that health talk was regularly given to them during each visits especially on family planning. Immunization against tetanus was reported to be given to them during ANC visit.

However, despite the level of good knowledge of ANC found in our study, we did not find knowledge as a singular factor that could influence the utilization of ANC facilities. This finding is inconsistent with that in Japan where knowledge was found to be sole factor associated with ANC utilization. In Ethiopia, it was shown that non attendant of ANC was associated with poor knowledge of ANC [25]. In addition, a study carried out in Islamabad revealed that of the women who did not avail themselves of antenatal care, 75.5% cited ignorance about the importance of antenatal care [20].

Perception of ANC was predominantly negative though 96.5% believed that attending ANC improves their health and that of their unborn child. In addition 62.6% agreed that they register for ANC for the purpose of where to deliver. They also positively perceived that ANC can reduce morbidity and mortality in women. Majority of the respondents believed that ANC improves pregnancy outcome. This negative perception may not be unconnected with the relatively large number of the respondents who had secondary education, because education has been associated with increasing perception of ANC use. We found significant association between perception and ANC utilization. This finding agreed with the study in Japan which saw good perception as the most valuable precondition for any healthy behaviour and that women who had a positive perception towards ANC had a higher proportion of ANC visits compared with those with a negative perception[8].

Another outcome of our study was that public (Government) health facilities were the preferred choice among the ANC facilities used by majority of the respondents. Among reasons chosen by the respondents, free health services was the most stated reason for utilizing public health facilities, followed distantly by satisfactory treatment of illnesses during pregnancy. This could be due to the lessening of economic burden by the free health services programme in Ondo state as reported by earlier researcher which showed that economic factors are proportionally associated with ANC utilization [26]. However, economic reason was not found to be directly associated with the utilization of public health facilities in this study.

Previous delivery of healthy babies was the most single important factor that was positively associated with the utilization of all ANC facilities whether public or private. This is understandable because the final most cherished outcome of every pregnancy is delivery of a live baby and women may care less about what else is achieved once there were no associated complications throughout pregnancy period and at delivery.

We also found that respondents' knowledge is significantly influenced by respondents' type of occupation, number of previous pregnancy, religion practiced, husband's occupation and educational attainment. Also respondents whose husbands were civil servants and farmers were about twice more likely and thrice less likely respectively to have good knowledge of ANC than the traders. This is understandable as most civil servants are educated while most

farmers had no education, hence no exposure to ANC activities. Educational status of respondents, their occupation, number of previous pregnancies and whether receives ANC or not significantly affects respondents' perceptions of ANC. Unlike in knowledge of ANC, uneducated respondents were over twelve times more likely than respondents who had tertiary education to have positive perception of ANC services. This could be due to the facts that, the educated respondent were getting far less than they expected from ANC.

5. CONCLUSION

This study showed that free health services for pregnant women in Ondo State were the main determinant of the utilization of public ANC facilities in Okitipupa LGA, while previous safe delivery of a healthy baby was the main reason for the utilization of any ANC facilities (public or private). Knowledge of ANC was good as the respondents excellently demonstrated that they knew the term ANC, its purposes and services. High proportion of the women responded positively to attitudinal questions on ANC and their perception on ANC was generally considered positive.

CONSENT

All authors declare that 'written informed consent was obtained from the patient (or other approved parties) for publication of this case report and accompanying images.

ETHICAL CONSIDERATIONS

Ethical approval for the study was obtained from the Ondo State Ethical Review committee of the Ministry of Health, Akure. Purpose and implication of the research were explained to the participants. Written informed consents were obtained from all the participants at the onset of the study and all information were treated with strict confidentiality.

RECOMMENDATIONS

The Ondo State Governments should sustain the free health services programme for pregnant women. From the perception of the respondents, the Ondo State Government should employ and motivate more nurses, midwives and doctors to ensure effective delivery of ANC services.

Factors such as risk identification and management with good delivery practices by health workers should be strengthened to ensure safe and healthy delivery of babies - an outcome strongly seen by respondents as the strongest single reason for the utilization of any ANC services.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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