ORIGINAL RESEARCH ARTICLE

Factors associated with the number of antenatal care visits among internally displaced women in northern Nigeria

DOI: 10.29063/ajrh2021/v25i2.12

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Abstract

This study explored the factors associated with the uptake of antenatal care services among internally displaced women (IDW) in northern Nigeria. The sample included ANC visits for 422 respondents who had a birth five years before the survey and living in the selected camps. Multinomial logistic regression was applied. Findings showed that only 28% of women visited ANC clinics for the recommended number of visits. IDW with some form of education were significantly more likely to have attended four or more ANC visits compared to the IDW with no education. Other covariates found to have a significant relationship with four or more ANC visits include, camp of displacement and access to newspaper. To improve uptake of ANC to fit the recommendations of the WHO and meet SDG3, the government and humanitarian organizations should continue to use media as a tool for advocacy in educating women on the benefits of complying with the recommended number of ANC uptake. *(Afr J Reprod Health 2021; 25[2]: 120-130).*

Keywords: Reproductive health, antenatal care, internally displaced women, northern Nigeria

Résumé

Cette étude a exploré les facteurs associés à l'utilisation des services de soins prénatals chez les femmes déplacées à l'intérieur du pays (IDW) dans le nord du Nigéria. L'échantillon comprenait des visites prénatales pour 422 répondants qui avaient accouché cinq ans avant l'enquête et vivant dans les camps sélectionnés. Une régression logistique multinomiale a été appliquée. Les résultats ont montré que seulement 28% des femmes se sont rendues dans les centres de soins prénatals pour le nombre de visites recommandé. Les IDW ayant une certaine forme d'éducation étaient significativement plus susceptibles d'avoir assisté à quatre visites prénatales ou plus que les IDW sans éducation. Les autres covariables qui ont une relation significative avec quatre visites prénatales ou plus comprennent le camp de déplacement et l'accès au journal. Pour améliorer le recours aux soins prénatals pour qu'ils correspondent aux recommandations de l'OMS et pour atteindre l'ODD 3, le gouvernement et les organisations humanitaires devraient continuer à utiliser les médias comme un outil de plaidoyer pour éduquer les femmes sur les avantages de se conformer au nombre recommandé de recours aux soins prénatals. *(Afr J Reprod Health 2021; 25[2]: 120-130).*

Mots-clés: La santé reproductive, soin prénatal, personnes déplacées à l'intérieur du pays, nord du Nigeria

Introduction

The International Displacement Monitoring Centre (IDMC) defines internal displacement to be the forced movement of people within the country they live in[1]. Persons or groups of individuals who have been forced or obliged to flee or to leave their homes or places of habitual residence as a result of or to avoid the effects of armed conflict, situations of generalised violence, violations of human rights or natural or human-made disasters and who have not crossed an internationally recognised state border are referred to as internally displaced persons or IDPs[1-2]. During displacement, the reproductive health needs of displaced women do not disappear but usually are overshadowed by what governments, humanitarian organisations as well as policymakers view as immediate needs for IDPs[3-4]. This ranges from the provision of food, water, shelter and security while paying less attention to reproductive health services. Since antenatal care (ANC) is an essential prerequisite for a healthy pregnancy and good delivery outcome, humanitarian organisations and governments can improve the provision of reproductive health services in camps especially to meet up with the needs of pregnant internally displaced women (IDW).

Antenatal Care (ANC) is a critical requirement in maintaining a healthy pregnancy and getting a good birth outcome. To experience a healthy pregnancy, avoid the risk of stillbirths, pregnancy complications and prepare mothers for a good delivery outcome, the World Health Organization (WHO) has recommended that women should have attended at least four ANC visits and at least one visit in each trimester[5]. One of the population groups with the greatest need for ANC is the internally displaced women living in countries facing a humanitarian crisis. Unfortunately, these are also the population group facing daunting barriers to reproductive health services in general and ANC in particular[6].

Uptake of ANC services among IDW in this study is determined by the antenatal care policy set in Nigeria which follows the WHO's approach to promoting safe pregnancies, recommending at least four ANC visits for women without complications[7]. The approach called "focused antenatal care" emphasises quality of care during each visit instead of focusing on the number of visits. Early detection of problems during pregnancy leads to more timely treatment and referrals in the case of complications[8].

The Health Behavioural Model of health services has been used extensively to identify some factors that influence the uptake of ANC in general and the number of ANC visits in non-crisis settings in sub-Saharan Africa[9-10]. This study, therefore, extends our understanding of the role of the predisposing, enabling and need factors described above on frequency of ANC visits for internally displaced women.

This study aims to assess the factors associated with ANC visits. The specific objectives are to:

- Assess the status of ANC uptake among internally displaced women;
- Examine the number of ANC visits among internally displaced women; and
- Identify the factors associated with the recommended number of ANC visits.

Methods

Cross-sectional data were collected in year 2017 using structured questionnaire adapted from the Measure Demographic and Health Surveys. The survey questionnaire comprised of data on individual characteristics of the women and antenatal care. Also collected were data on attitudes of health workers, proximity to health facilities and social disruption and displacement. The inclusion criterion for this study was married women whose last pregnancy which occurred within the five years preceding the survey. While women who were pregnant at the survey date and who have never been pregnant were excluded from the analysis. Additionally, being currently a displaced woman and living in one of the three IDPs camps selected was part of the criteria for selection. Further, the three selected camps were chosen from among other potential camps. It was intended to ensure that the study was only representative of the camps and its population, but also economically feasible. The rationale for the 3 selected camps was that, insurgent attacks are still ongoing in the region and as such only the safe and economically accessible camps were selected using a convenience sampling method. The camps selected include New-Kuchingoro, Durumi and Gurku. Participants from each camp selected were by the use of systematic sampling technique after listing all women who met the study's inclusion criteria which were being in the 15-49-year age group; have at least given birth to a child in the five years preceding the study, and being a usual residence in the camps selected. A sample of 382 was calculated from a total population size of 1,162,080 as estimated by the Internal Displacement Monitoring Centre (IDMC) in the year 2015. Taking into consideration non-response, this study inflated the sample size by 10% which brings a total minimum sample size $\boldsymbol{n}$ to 420. During the interview, 5 women were dropped because they did not meet up with one of the study's criteria (i.e. pregnant at the time of survey, refused to respond to questions on attendance and left shortly after the interview started). However, we received 422 responses from the survey report because we had 7 replacements instead. Accordingly, 81, 181 and 160 eligible women responded to the survey questions from New-Kuchingoro, Gurku and Durumi camps respectively.

Data collection process

The face to face interview method was used to administer the structured questionnaire. The interview was a one to one conversation in which trained research assistants asked questions directly

to the respondents who provided the answers to the questions. The use of the face to face interview was considered to be the most appropriate because of the low literacy levels of the women's difficulty in delivering questionnaires using other means, and to ensure that the response rate was high and a questionnaire was completed and returned for data processing within the shortest time possible. The face to face interview process also facilitated clarifications of questions, improved respondent comprehension of questions and improved quality of data collected. The interviews were conducted in Hausa and Pidgin language and somewhere private within the camp to ensure that respondents were at ease while providing data.

To ensure that the data collected was of high quality, the following data quality assurance procedures were implemented before, during and after the data collection. To ensure the reliability of the results a lot of data quality assurance measures were used.

- The researcher recruited four survey enumerators with social science background and experience in conducting social research. Three days training session of the research assistants was carried out on the data collection instrument.
- The training of the data collectors included the pretesting of the research tools as part of the enumerators' field practice. The pilot study took place in one of the camps (New-Kuchingoro) located in Federal Capital Territory (FCT). After the pretesting, questions were improved for clarity, ambiguity and simplicity. The training also discussed the field protocols, roles and responsibilities of enumerators and supervisor. It also included questionnaire administration.
- The fieldwork was supervised by an experienced researcher, who randomly visit study locations to spot check field activities and clarified field issues and edited completed questionnaires. The supervisor's role included on-spot checking for accuracy of the completed questionnaires; overall administration of the research process; and was responsible for coding the responses before handing them over to the researcher for verification before data entry.
- Experienced data entry clerks who worked along with the supervisor and researcher during the data collection were recruited. They were trained in data entry procedures to ensure the accuracy of data entry.
- *Data-editing and coding were implemented*at two stages. The first was done during data collection and the second edits and coding were done in the office. The checks ensured that all the data captured were correct, consistent and logical.
- *Data cleaning was done as a statistical* procedure. Its major purpose was to make sure that the data was ready, correct and good for analysis. During the cleaning, identified outliers and missing data were traced to the individual records involved and corrected.

Variable measurement

Outcome variable

The outcome variable in this study was the number of visits to antenatal care clinics. The variable was constructed according to the recommendation of the WHO, which considers that pregnant women should visit the health facilities at least four times. Thus, antenatal care uptake was measured in this study as the number of antenatal care attended by the women for their most recent birth. Women who did not attend any ANC services at a health facility during their last pregnancy was coded as "0", women who attended ANC 1 to 3 times was coded as "1" while those who attended ANC at least four times were coded as "2".

Explanatory variables

There are three categories of explanatory variables (i.e. predisposing, enabling, and needs factors). The predisposing factors are level of education, woman's age, religion, and place of residence. The enabling factors are camp of displacement, attitude of health provider, proximity to a health facility, availability of reproductive services, access to TV, radio, and newspapers. The need factors are experience of previous pregnancy complications and previous delivery complications.

Statistical analysis

At the bivariate level, Pearson's Chi-square statistic was used to explore the differentials and associations between the explanatory factors and uptake of ANC. To do this the chi-square statistic of the form $x^2 = \sum_{i=1}^{i} \frac{(O_{ij} - E_{ij})^2}{E_{ij}}$ was used. The

association between the explanatory (predisposing, enabling and need) factors and uptake of ANC were significant if the $p<0.05$. The multinomial model used the maximum-likelihood estimator to evaluate the probability of belonging to any category of ANC visits. Since ANC visits were categorised into three, the calculation of two equations was required, that is, a category for each category relative to the reference category, to describe the association between 1-3 and 4+ ANC visits by each predisposing, enabling and need variables. The multinomial formula used was in the form of:

$$n = \ln\left\{\frac{p(\zeta_i=n)}{p(\zeta_i=1)}\right\} = \propto_n + \sum_{k=1}^{K} \beta_{nk} X_{ik} = Z_{ni}$$

Hence, for each case, there were two predicted log-odds, one for 1-3 ANC visits and a second for 4 or more ANC visits while maintaining no ANC visit as the reference category. The formula used in this estimation was of the form:

$$p(\zeta_i = n) = \frac{\exp(Z_{ni})}{1 + \sum_{\tau=2}^{3} \exp(Z_{\tau i})}$$

For the reference category, the formula used was of the form:

$$p(\zeta_i = 1) = \frac{1}{1 + \sum_{\tau=2}^{3} \exp(Z_{\tau i})}$$

Measures of association between ANC uptake and selected explanatory variables were presented as Relative ratios (RR) with the confidence of interval (CI). The analysis was conducted using Stata software (version 12).

Results

The results of women characteristics and factors were presented under three predictive variables such as predisposing, enabling and needs factors. The predisposing characteristics of the women described in the study are age, marital status, education, religion, place of residence and camp of displacement of the women. The selection of the vital background characteristics mentioned above could influence ANC uptake positively or negatively. The enabling factors were factors that can either facilitate or impede the utilisation of the continuum of ANC uptake. These factors are structural in natureand they include distance to health facilities, availability to health facilities, and attitudes of health workers among others. In this study, the enabling factors comprise of the variables that either facilitate or have the potential to impede utilisation of RHS. The main ones examined in this study are access to information about health services. Others are the attitude of health workers, proximity to health facilities and the availability of RHS. Lastly the needs factors are important in ensuring that pregnant women attend ANC visits regularly regardless of their predisposing and enabling characteristics. This is because the actual or perceived need for ANC determines whether or not pregnant women will attend the recommended number of ANC visits. The reason is that the presumption that for an individual to seek health services, there must be either a clear need which suggests that the individual is already sick and therefore in demand for care or the individual is aware of the risks of getting a health problem if appropriate action to prevent it is not taken. In this regard, in this study, it is assumed that IDW would seek ANC uptake either because they are in a situation that requires the service or are aware that not receiving routine ANC uptake services can put them in a situation of health adversity. Two of the important factors that can motivate women to attend ANC considered in this study are a history of pregnancy complications and a history of delivery complications. These two conditions are most likely to motivate women to seek ANC during their most recent pregnancy regardless of their humanitarian emergency.

Overall in this study, the median age of the women was 26 years, indicating that they were young, and the age distribution of women shows the expected age pattern. The major disparities are observed for the enabling factors. A small proportion of women have access to TV, radio and newspapers. In addition, the proportion of IDW with referral systems is quite small (17%). However, the attitude of health providers (good vs poor) is balanced, showing that generally, health providers are not welcoming. The distribution of IDW for predisposing and need factors does not indicate anything peculiar.

The results in Figure 1 contain sections of information that is independent of each other. Each section is calculated using total of each occurrence by row. The result in Figure 1, show that almost half of the IDW did not attend any ANC visits during the last pregnancy. Even though, 49.5% of IDW in their first trimester attended ANC, it should

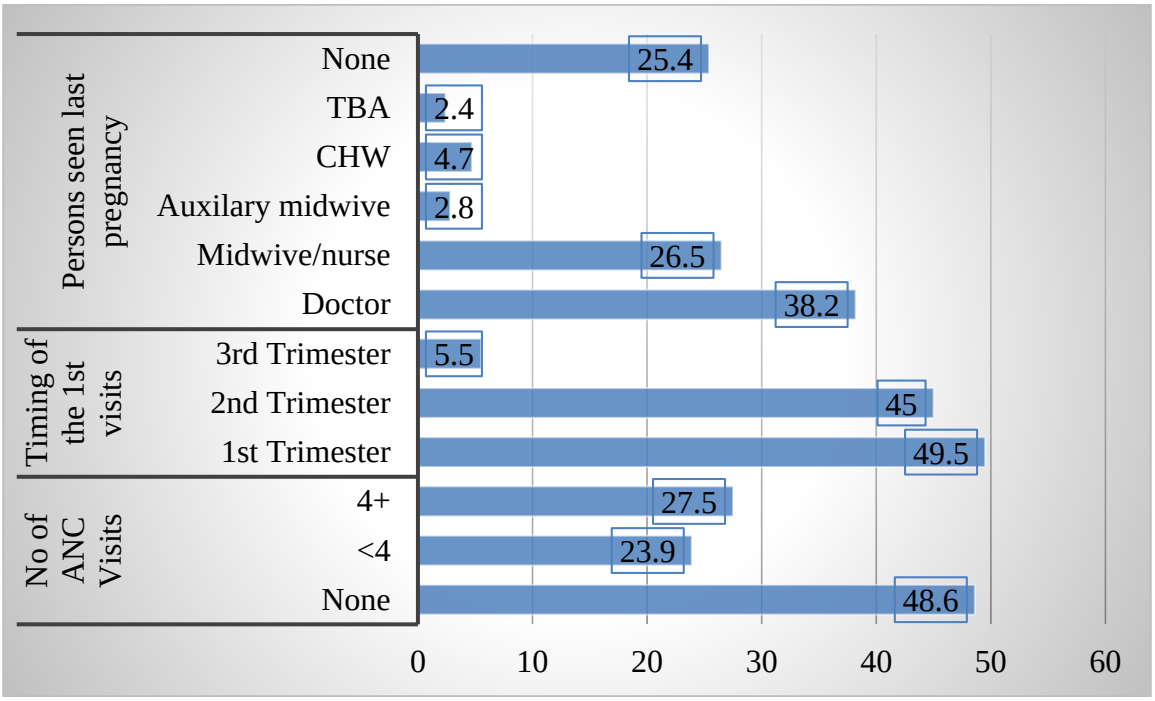

Figure 1: The percentage distribution of IDW by selected characteristics

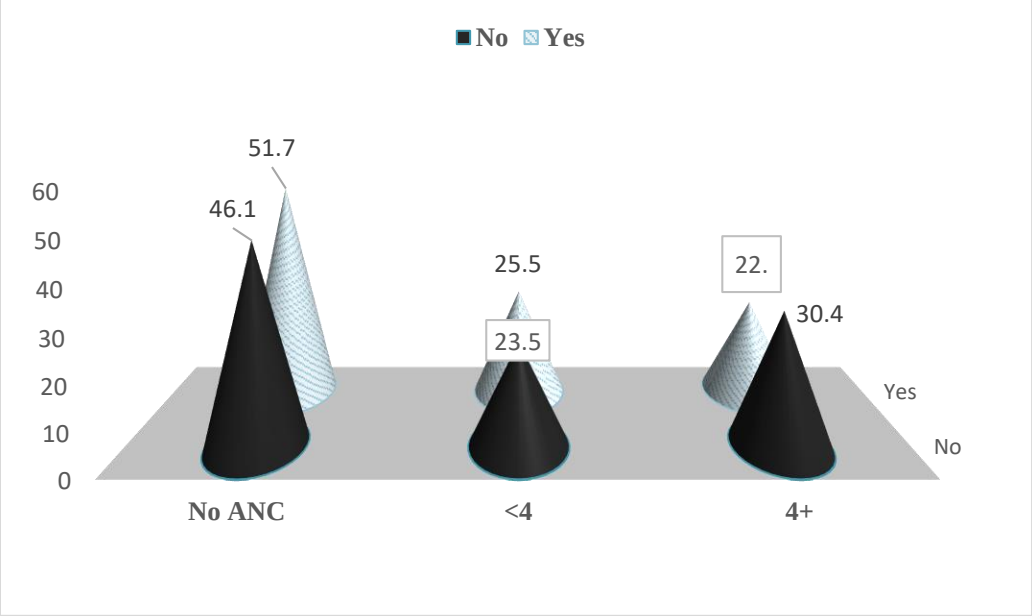

Figure 2: The percentage distribution of number of visits during last pregnancy by experience of pregnancy complications

be noted that the proportion of IDW who began ANC uptake in their second trimester (45%) is very high and third trimester (5.5%) is not negligible, and this is very dangerous.

The data presented in Figure 1 shows that even though about 38% and 27% of the IDW were attended to by doctors and midwives/nurses respectively, about 25.4% of the IDW did not seek any health professional for pregnancy assessment during their last pregnancy.

The bivariate results of the predisposing factors, as shown in Table 1 indicate that more than half (55.9%) of women with no education did not attend ANC at all. Although, more than 4 in 10 of

Table 1: Percentage distribution of women by antenatal care uptake and selected characteristics

Variables	Number of ANC Visits			X^2	Total
	None	1 - 3	4+		422
Predisposing					
Age group					
<25	49.5	18.8	31.8	10.69; p=0.031	170
25-34	46.6	24.7	28.7		178
35+	50.4	33.8	14.9		74
Religious beliefs					
Christians	45.5	28.2	26.3	6.65; p=0.036	255
Muslims and others	53.3	17.4	29.3		167
Level of education					
No education	55.9	25.3	18.8	12.56; p=0.012	170
Primary	40.5	23.0	36.5		126
Secondary or higher	46.8	23.0	30.2		126
Place of residence					
Urban	40.9	30.7	28.4	19.91; P=0.000	264
Rural	61.4	12.7	25.9		158
Current camp					
Gurku	61.4	12.7	25.9	28.74; 0.000	158
Durumi	47.0	28.7	24.3		181
New-Kuchingoro	27.7	34.9	37.3		83
Enabling					
Access to newspapers					
Regular	45.5	32.7	21.8	5.27; p<0.260	53
Occasional	38.1	26.3	35.7		42
Not at all	50.1	22.2	27.4		325
Access to radio					
Regular	79.6	13.0	7.4	27.55; p<0.0001	54
Occasional	44.6	32.3	23.1		65
Not at all	43.9	24.1	32.0		303
Access to TV					
Regular	62.8	20.9	16.3	9.47; p<0.050	43
Occasional	37.9	41.4	20.7		29
Not at all	47.7	22.9	29.4		350
Proximity to a health facility					
Within 1 km	39.1	29.6	31.3	36.55; p<0.0001	115
<5 kms	36.4	34.3	29.3		140
>than 5 kms	65.5	11.4	23.3		167
Availability of trained health workers					
Yes	32.2	24.7	43.2	32.31; p<0.0001	146
No	57.2	23.6	19.2		276
The attitude of health provider					
Good	39.4	27.7	32.9	14.46; p<0.001	213
Poor	57.9	20.1	22.0		209

women with primary education attended ANC 1-3 times during pregnancy periods. Surprisingly, about 25.3% of women with no education still attended ANC but less than four times. The bivariate results show that the level of education is significantly associated with the number of ANC visits at 0.05 level.

Considering the results of the distance to the health facility, the proportion of IDW who did not attend ANC increased from 39.1% among women living within one km to a health facility to 65.3% among women living more than five kilometres from a health facility. Conversely, the proportion of IDW who attended the 4 or more ANC visits reduced monotonically from 31.3% among women living within one km to a health facility to only 23.3% among women living more than five km from a health facility. The result shows that distance to a health facility was significantly associated with the number of ANC

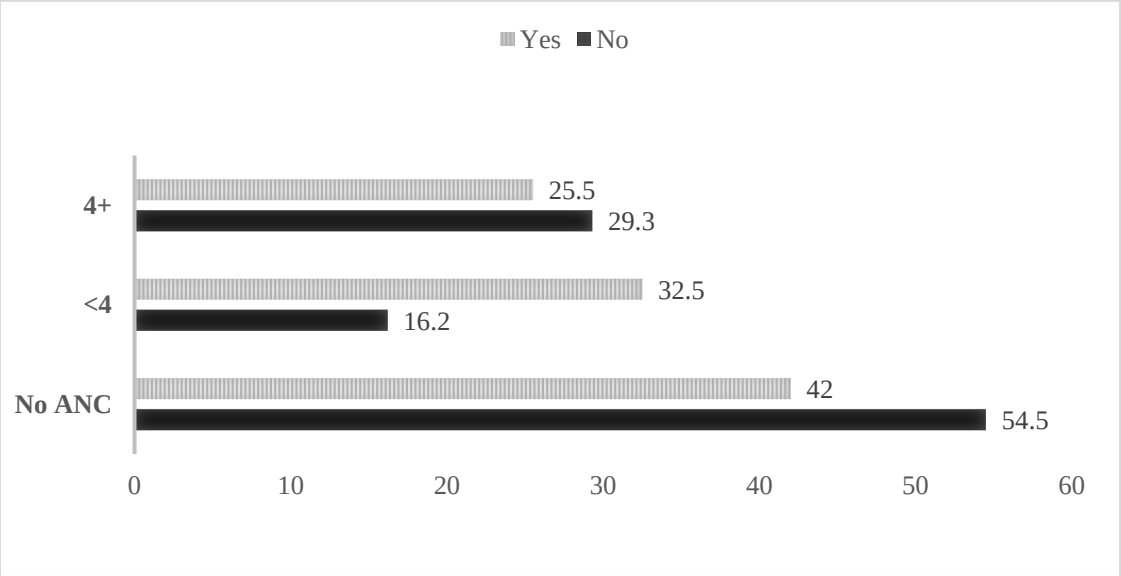

Figure 3: The percentage distribution of history of delivery complications and attendance of Antenatal care

visits at 0.05 level. Other variables found to be significant at 0.05 level in the bivariate analysis were woman's age, religion, rural/urban residence, camp of residence, access to radio and TV, availability of reproductive health workers, and the attitude of health providers.

Figure 2 shows that 51.7% of women who experienced pregnancy complications during last pregnancy did not attend ANC at all, compared to 46.1% of their counterparts who had no complications. The difference for those who attended ANC was small regardless of the number of visits attended. Hence, this figure shows that a history of pregnancy complications was not significantly associated with the uptake of ANC visits during the last pregnancy.

The data in Figure 3 shows that 54.5% of IDW with no history of delivery complications did not attend ANC visits compared to only 42.0% of IDW with a history of delivery complications. However, IDWs who had delivery complications were twice as much in attending ANC clinics for 1-3 times. The opposite is exact for IDWs who attended ANC at least four times. That is, the proportion of those with delivery complications is higher than those without complications. The results show that the status of delivery complications was significantly associated with a number of ANC visits at $p<0.05$.

Table 2 presents the results from the multinomial logistic regression analysis. The results from the likelihood ratio chi-square test is significant and it is safe to infer that at least one population regression slope is significantly different from zero. Based on the LR test, we can say that the model containing the full set of predictors represents a significant improvement in fit relative to a null mode (LR X^2 (36)= 142.13, $P<0.05$) and that means at least one population slope is non-zero. Table 2 presents the results from the multinomial logistic regression analysis. The adjusted results were a nested logistics, with the first panel adjusted for the effects of predisposing variables on the outcome variable, while the second and third panel was adjusted for the effect of enabling and need variables on the outcome variable. The results of much interest are those for the WHO recommended 4+ ANC visits against no visit. It should be noted, however, that the predisposing factors found to influence 1-3 ANC visits were education, age and current camp of displacement. The enabling factors which influenced 1-3 ANC visits were availability of trained health workers, access to newspapers and radio. None of the needs factors found to influence 1-3 ANC visits.

The results for 4+ ANC visits indicate that women who have no education have significant lower relative risk of up taking ANC up to four times and more as compared to women with primary education (RR: 0.15; CI: 0.05-0.42, $p<0.05$). During the multivariate stage of this analysis, place of residence variable was dropped due to multicollinearity as it was highly correlated

Table 2: Adjusted multinomial logistic regression model predicting factors influencing attending ANC visits

Predictors	No ANC vs 1-3 ANC visits		No ANC vs 4+ ANC visits	
	RR	**IC**	**RR**	**IC**
Predisposing				
Level of education				
No education	0.38	0.134-1.06	0.15*	0.05-0.42
Primary®	1.00		1.00	
Secondary+	0.52	0.16-1.72	0.45	0.15-1.39
Age group				
15-24	0.38*	0.14-0.99	0.71	0.29-1.70
25-34®	1.00		1.00	
35+	2.32	0.78-6.92	0.33	0.09-1.20
Religious affiliation				
Christian ®	1.00		1.00	
Muslim	1.10	0.42-2.90	2.15	0.75-6.15
Current Camp				
Gurku®	1.00		1.00	
Durumi	0.96	0.299-3.06	0.17*	0.05-0.56
New Kuchingoro	8.22*	2.48-27.24	4.07*	1.34-12.36
Enabling				
Access to newspapers				
Regular	65.04*	10.21-414.27	33.29*	5.16-214.85
Occasional	6.58*	1.70-25.46	2.46	0.63-9.54
Not at all ®	1.00		1.00	
Access to radio				
Regular	0.10*		0.07**	
Occasional	0.60	0.02-0.45	0.31	0.014-0.39
Not at all ®	1.00	0.22-1.64	1.00	0.11-0.89
Access to TV				
Regular	0.27		0.65	
Occasional	1.74	0.05-1.49	0.34	0.75-3.89
Not at all ®	1.00	0.44-6.93	1.00	0.43-15.17
Distance to health facility	1.00		1.00	
<5 km ®	1.38	0.59-3.23	1.20	0.53-2.75
5+km				
Availability of trained health workers				
Yes ®	1.00		1.00	
No	0.33*	0.14-0.77	0.78	0.31-1.93
Attitude of health workers	0.75	0.33-1.69	1.39	0.60-3.21
Good	1.00		1.00	
Poor®				
Needs				
History of delivery complications				
Yes	3.54	1.50-8.32	1.27	0.56-2.87
No ®	1.00		1.00	
A history of pregnancy complications				
Yes	1.53	0.65-3.59	1.70	0.75-3.89
No ®	1.00		1.00	

Note: Level of significance: ®= Reference category; *= p<0.05; **= p<0.01; OR=Odds Ratio; CI= Confidence Interval

with the camp of residence. Although, IDW living in New Kuchingoro camp located in the Federal Capital Territory are 4.07 times significantly more likely to uptake ANC than women living in Gurku which is in the far outskirts of Nasarawa State (CI: 1.34-12.36; p<0.05). However, even though the camp in Durumi is located in a strategic location within the Durumi suburb of Abuja, results in this study shows that IDW have significant lower relative risk (RR: 0.17; CI: 0.05-0.56; p<0.05) of

up taking ANC compared to women living in Gurku camp located in outskirts of Nasarawa state. As expected, women who read newspapers regularly and occasionally are significantly likely to uptake ANC up to 4 times and more compared to those who did not read (RR: 33.39; CI:5.16-214.85, p<0.05; &RR: 2.46; CI:0.63-9.54) respectively.

Discussion

The number of ANC visits to a health facility is one of the most important measures recommended by the WHO for the attainment of significant reductions in maternal mortality in the developing countries[12]. Findings of this study provide empirical evidence that education, camp of displacement and exposure to media especially newspaper have implications for the ANC uptake among IDW in northern Nigeria. These findings remained consistent even after adjusting for the effects of possible confounders. Considering the number of ANC uptake, results from this study showed that the majority of respondents did not attend health facility for ANC uptake during their recent pregnancy periods.

Even in though in Nigeria, the conditions where reproductive health services are available and attendance of 4 or more ANC visits increased in recent years, the overall rate is still low[13]compared to Kenya, Ghana and Botswana. In addition, it is established that a large proportion of women in Nigeria initiate ANC late leading to poor pregnancy and delivery outcomes[14]. Adewuyi *et al*., (2018) in their study ascertained that the majority of the women who do not attend ANC or initiate ANC visits late are IDW and most of them are in the North-Eastern Nigeria (This is notwithstanding that many of these IDPs are located in much safer areas such as Abuja and Nasawara States, where health services are ordinarily available). The question, therefore, is why is the prevalence rate of attending the recommended 4 or more ANC visits low among IDW? Previous studies have established that women in Nigeria were not making enough progress towards the WHO's goal of achieving at least four ANC visits when there are no complications. A study conducted established that a very small proportion of the women attendees examined in their study had a minimum acceptable quality of ANC, while most women did not attend nor receive any of the ANC recommended components[15]. This clearly showed that there is still underutilisation of ANC and consequently, the possible reason for the high maternal mortality in Nigeria. However, considerable increase in attendance of ANC up to four times and more can be achieved most especially if efforts of the international organizations and donor communities re-doubled to ensure that the recommended number of ANC attendance is achieved among IDW in Nigeria, and perhaps the country could be placed back on course towards achieving the WHO's recommendation and the SDG3.

The importance of education in the health of women is already well documented, and one of the areas that education, as a predisposing factor influences, is ANC. The finding of the study on the association between education and uptake of ANC shows that indeed IDW with primary education are more likely to have attended the recommended four or more ANC visits during their last pregnancy. This finding is very similar to several previous studies listed hereunder, that found that educated women are more likely to attend the recommended number of ANC visits as compared to those with no education[16-17]. This is because education has a high private health returns which can be realised through easy access to health facilities, attitudinal change and break down of cultural values and norms that impede better health behaviours. It can also capacitate health services utilisation because of the higher financial returns that accrue with each year of education.

Several control factors have also been analysed in this study. Among the control factors that were examined, the study found that education, age, availability of health service provider, the camp of displacement, and access to newspaper are significant predictors of uptake of ANC among the IDW. The result of the assessment of the effect of camp of displacement is consistent with that of previous studies in other developing countries and sub-Saharan Africa in particular[17-18]. The attendance of any ANC visit and the recommended four or more ANC visits in camps located in city areas is attributed to several factors. First, among these are accesses to information about the importance of ANC visits, followed by access to quality ANC services. Additionally, urban areas are also more likely to have health facilities with the right number and quality of health workers to provide quality ANC services than rural areas.

Increasing uptake of the recommended number of ANC visits by IDW in rural settings, therefore, requires access to ANC information, availability of ANC services and capable health workers to provide ANC services to pregnant women.

Previous studies have studied the role of sources of information on ANC visits and found that regular access to ANC information through the mass media can influence the uptake of ANC services. For instance, studies have found newspaper to positively impact the uptake of ANC services in India and Southern Nepal[-19]. Similarly, the findings of this study illustrate that women who have access to newspaper regularly are four times more likely to visit ANC at least four times among IDW in northern Nigeria. The finding suggests that the newspaper can be an effective mass media means of creating awareness for ANC uptake among IDPs.

In conclusion, maternal education, camp of residence, reading of newspaper are the main predictors of ANC uptake among IDW in northern Nigeria. There is need to educate women, those who have never been to school in particular on the importance of attending ANC up to at least four times in case of complications during pregnancy periods. Additionally, since IDW who have access to newspaper regularly and occasionally are more likely to uptake ANC up to four times and more, it is an indication that newspaper is an advantageous means of creating awareness on spreading the importance of ANC uptake to IDW. The study also revealed that women who live in camps that are closer to towns with good road networks and who experienced good attitude from health workers during ANC treatments are more likely to uptake ANC up to four times than women whose camps are far from town and experienced poor attitude from health workers.

Ethical consideration

Approval was obtained from the appropriate REC at North-West University and after determining the research does not pose any risks to participants, the research was approved by the North-West University's Institutional Review Board (IRB) under research approval certificate number: 0050917A9. The approval certificate was then presented to camp officials who allowed the research to be conducted.

Additionally, informed consent was secured from all participants aged 15-49 years of age in accordance with the national regulations governing consent. In Nigeria, the constitution recognises married adolescents who are below the age of 18 years as adults and capable of giving consent. The Child Rights Act 2003 provides that a child who has attained the age of 16 years has the right to give consent in scientific investigation and access treatment without parental consent[11]. All participants in the IDP camps had explained the objectives of the study, potential risks and benefits of the study and their consent were obtained before the interviews were conducted.

Acknowledgement

The earlier version of this research was submitted as part of Fisayo T. Adebangbe nee Titilope F. Popoola's doctoral thesis. Authors would like to thank the Faculty of Humanities, North-West University, South Africa, for its support for this study.

Contribution of authors

Fisayo T. Adebangbe contributed to this article by participating in conceptualization of the research, planning and implementation of the fieldwork activities, data analysis and report writing.
Akim J. Mturi contributed to this article by participating in conceptualization of the research, fieldwork planning, data analysis, writing and editing the paper.

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