



Maternal Health Care Behaviour in Nigeria: the role of female autonomy.

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Abstract

This paper examined the extent to which community-level female autonomy and other characteristics at individual and community levels influence antenatal care (ANC) attendance in Nigeria. A cross sectional data- the 2008 Nigeria Demographic and Health Survey (NDHS) and a sample of 16004 women aged 15-49 years were used in this study. Multilevel modelling was employed for data analysis. The results indicated that community-level female autonomy was significantly associated with ANC attendance. Women residing in high autonomous communities were more likely to attend four ANC visits. However, this association diminished net of other individual- and community-level factors. This finding illustrates that community-female autonomy does not affect ANC attendance independently but these effects are channeled through individual-level autonomy and other factors at both levels. There is the need to consider community female autonomy in future assessments of the total effects of women's autonomy on maternal health care behaviour. To improve ANC attendance, in Nigeria, interventions to increase women's autonomy, education and economic status at the community-level should be considered, particularly in disadvantaged communities of the country.

Keywords: Antenatal care, autonomy, community, multilevel modelling, Nigeria

1. Introduction

Over the last two decades, there has been a growing interest in maternal health. This is reflected in the Millennium Development Goals (MDGs) and consensus reached at different international conferences such as the Safe motherhood conference in 1987, the International Conference on Population and Development (ICPD) in 1994, among others (Ononokpono, 2013). The aim of these conferences was basically to improve access to maternal and reproductive health services and reduce maternal mortality particularly in developing countries. Although there has been a decrease of 47 percent in maternal mortality ratio in sub-Saharan Africa (UNFPA, 2012), maternal health situation in most African countries remains poor. The lifetime risk of maternal mortality in Africa is 1 in 26 (Barate and Temmerman, 2009). The World Bank estimates show that Nigeria contributes 14 percent of global maternal deaths (World Bank, 2013). Antenatal care (ANC) is one of the important interventions recommended to reduce maternal mortality (Titaley, Hunter, Heywood and Dibley, 2010). Further in this era of HIV/AIDS, it helps in prevention of mother to child infection and promotes use of skilled assistance during delivery which in turn promotes use of postnatal care services for both the mother and child (Ochako, Fotso, Ikamari, and Khasakhala, 2011). The World Health Organization recommended four antenatal care visits during pregnancy (WHO, 1998) but unfortunately, data from most African countries and particularly Nigeria indicate that ANC visit is still poor (UNFPA, 2004). Most women in Nigeria do not have access to antenatal care which is important in the monitoring and reduction of complications during pregnancy (National Population Commission (NPC) and Inter City Fund (ICF) Macro, 2009). However, concerted efforts have been made to understand the drivers of poor antenatal care attendance in developing countries including Nigeria.

Several studies have identified socio-economic determinants of ANC. Employment, household economic status, cost of accessing health care and urban-rural residence were found to be strongly associated with skilled antenatal care (Furuta and Salway, 2006; Shaikh, Haran, and Hatcher, 2008). Some studies in other sub-Saharan African countries and Nigeria showed that ANC was associated with demographic factors such as parity, maternal age and marital status (Magadi et al., 2000; Ononokpono et al. 2013; Stekelenburg et al., 2004). Gender inequality and women's status were found to be important factors associated with ANC and other maternal health care services (Hunt and Bueno de Mesquita, 2010).

Most studies have focused on the socio-economic determinants of maternal health care behaviour and only few researchers have examined how contraceptive use, antenatal and delivery care, are related to a woman's autonomy (Hunt and Bueno de Mesquita, 2010; Woldemicael and Tenkorang, 2009). More importantly, the role of community female autonomy in antenatal care attendance has not received adequate attention. Women's health care behaviour is complex and to a large extent may be associated with the ways women are treated in the society and the status accorded to them (WHO, 2009). Presumably, how women are being regarded and treated in the society can influence their decision to attend antenatal care. Some studies on maternal health care have used several dimensions of autonomy such as education, employment status, level of income, freedom of movement, management of resources, household decision making and wife-beating to represent autonomy (Beegle, Frankenberg and Thomas, 2001; Bloom, Wypij, and Gupta, 2001; NPC and ICF Macro, 2009; Roy and Chaudhuri, 2008). In this study, we considered a woman's autonomy in relation to decision making regarding her own health care. The reason is because in Africa and Nigeria in particular, men decide when, how and where women should seek health care (Odimegwu, Adewuyi, Odebiyi, Aina, Adesina, Olatubara, and Eniola, 2005).

Understanding the role of a woman's autonomy in ANC attendance is important particularly in patriarchal societies such as Nigeria where gender roles and social inequalities between women and men exist (Antai, 2011). In addition, in societies where men wield so much authority, a woman's autonomy may be compromised and this in turn could influence her health care-seeking behaviour. Further, the role of community female autonomy may matter because individuals residing in the same community tend to share similar preferences and health care practices; thus the decisions of less autonomous women to attend antenatal care may be influenced by health care practices of more autonomous women in the community in which they reside. Considering the current interest on the effects of the community context on health outcomes, the objectives of this study are: to examine whether community women's autonomy play a role in antenatal care attendance and also to identify other community and individual-level factors influencing antenatal care visits in Nigeria.

2. Materials and Methods

Data source

This study used data from the 2008 Nigerian Demographic and Health Survey (NDHS), a national representative survey of 33,835 women aged 15-49 years. The survey provided information on population and health indicators. The sample for the 2008 NDHS was drawn to allow for separate estimates of key indicators for each of the 36 States of the country including the Federal Capital Territory-Abuja as well as urban and rural areas. The 2008 NDHS used a stratified two-stage cluster design. First, a total of 888 clusters were selected in both urban and rural areas (NPC and ICF Macro, 2009). Second, a weighted probability sample of 36,800 households was selected from a list of households in the sampled clusters. Details of the survey have been discussed elsewhere (NPC and ICF, 2009). This study used data on 16004 women aged 15-49 who had their most recent birth in the five years before the survey. Analysis was restricted to the last birth as it is assumed that the woman could clearly remember events during the last pregnancy (Ochako, Fotso, Ikamari, and Khasakhala, 2011).

The study involved the analysis of existing secondary data-set; therefore there was no need for ethical clearance.

Variable Measurements

The outcome variable is antenatal care visit. This is defined as attendance of four or more ANC visits during pregnancy which is in line with World Health Organization recommendation. This is a dichotomous variable and was re-coded as: 1 if a woman had 4 or more ANC visits and 0 if she had no visits and less than four visits.

The explanatory variables were selected based on previous studies on the use of maternal health care services. The main explanatory variable is a woman's autonomy measured at both individual and community levels. Community women's autonomy was defined as the proportion of women who made decisions on their own health care alone and jointly with their husbands or partners in the community (primary sampling unit (PSU)) and was divided into three tertiles, low, medium and high. Place of residence categorized as urban and rural; region of residence categorized as North-central, North-east, North-west, South-east, South-south and South-west. Community women's education was measured as the proportion of women with secondary/higher education in the community and divided into three tertiles low, medium and high. Community poverty was measured as the proportion of women from poor households in the community and categorized as low, medium and high.

The individual-level variables considered in this study included: individual woman's autonomy defined as decision making on a woman's own health care and categorized as: husband/others and wife alone/jointly with husband; mother's age at last birth is defined as the age of the woman at most recent birth and categorized as 15-24, 25-34 and 35-49 years; mother's education categorized as: no education, primary, and secondary or higher; employment categorized as working, not working; parity categorized as 1, 2-3 and 4 and above; mass media exposure assessed from the responses on whether a woman reads newspaper, listens to radio and watches television and categorized as: not at all, irregularly and regularly. The Demographic and Health Survey (DHS) household wealth index was measured as a standardized composite variable and categorized as poor, middle, Rich. This was derived from scores assigned to various household assets (NPC and ICF Macro, 2009). The wealth index is an indicator of household's socioeconomic status (Rutstein and Johnson, 2004).

The community variables were constructed by aggregating the individual characteristics at the community level (primary sampling unit or the cluster). In constructing the community variables, the index woman was excluded, so as to prevent high correlation between individual and community variables (Do, 2008).

Statistical analysis

Descriptive statistics were used on the selected background characteristics at the univariate level and the statistics were weighted to adjust for non-response and over-sampling. The chi square test of association was used to test the statistical significance of the variables. Multilevel logistic regression was used to determine the relationship between the outcome variable and the covariates at the individual and community levels. Multilevel modelling was considered appropriate, in order to account for the hierarchical nature of the DHS data (Antai, 2009) and to enable the researcher estimate individual and community level effects of a woman's autonomy on the outcome variable. A two-level multilevel logistic regression model was applied in this study and this implied that individuals (level 1) were nested within communities (level 2).

To examine the effects of individual-level autonomy and community women's autonomy on ANC visit, four models were estimated. The first model which is the empty model (Model 0) contained no explanatory variables. It decomposes the total variance into the individual and community components. Thus the empty or null

model was used to determine variations in ANC visits across communities. The second model (Model 1) included a woman's autonomy and other individual covariates. The third model (Model 2) contained community women's autonomy and other community characteristics to allow the assessment of the effects of community female autonomy on ANC visit when other community variables were controlled. The fourth model (Model 3) which is the final model contained individual and community level covariates. The final model was estimated to assess the effects of community female autonomy net of individual-level autonomy and other individual and community covariates.

In this study, the fixed effects which are measures of association of the explanatory variables with the outcome variable (ANC visit) were estimated. These were expressed as odds ratio (OR), 95% confidence interval and $p < 0.001$. Meanwhile, random effects were also estimated which are measures of variation in ANC attendance across communities and expressed as the intra-class correlation (ICC) or Variance Partition Coefficient (VPC); and proportional change in variance (PCV). The standard error (SE) was used to measure the precision of the independent variables (Antai, 2009). The VPC was calculated based on latent variable method (Merlo et al., 2006). In this case the VPC corresponds to the intra-class correlation coefficient (ICC) which is a measure of general clustering of ANC visit in the communities. The ICC was calculated as follows:

$$\rho = (\sigma_{\mu}^2 / (\sigma_{\mu}^2 + \pi^2/3)).$$

Where ρ is the intra-class correlation (ICC), σ_{μ}^2 is community level variance and $\pi^2/3 = 3.29$ represents the fixed individual-level variance (Merlo et al. 2005). Stata (version 11.1) was used for all analyses. The goodness-of fit of the models was determined using regression diagnostic, Akaike Information Criteria (AIC) and a lower value of AIC indicates a better fit (Boco, 2010).

3. Results

Descriptive analysis

The distribution of respondents by individual and community characteristics is presented in Table 1. Results show that almost half of the study sample were in age group 24-34 years (46.2%), had no education and belong to poor household wealth quintile. The majority of the women were working mothers (69.0%) and over two-third (70.4%) live in rural areas.

Table 1: Socio-demographic characteristics of women by antenatal care. Nigeria DHS, 2008.

Characteristics	All women N =16004		Antenatal care	P- value
	(n)	(%)	4 or more visits (%)	
<i>Mother's age at last birth</i>				
15-24 (ref)	5108	31.9	28.3	<0.001
25-34	7387	46.2	50.5	
35-49	3509	21.9	21.2	
<i>Mother's education</i>				<0.001
No education (ref)	7570	47.3	25.7	<0.001
Primary	3609	22.5	27.9	
Secondary/Higher	4825	30.2	46.4	
<i>Employment</i>				<0.001
Not working (ref)	4954	31.0	25.4	<0.001
Working	11050	69.0	74.6	
<i>Women's autonomy (decisions over own health)</i>				<0.001
Husband alone/Others (ref)	9862	61.6	50.8	<0.001
Wife alone/Jointly	6142	38.4	49.2	
<i>Household wealth index</i>				<0.001
Poor (ref)	7579	47.4	27.3	<0.001
Middle	2960	18.5	21.1	
Rich	5465	34.1	51.6	
<i>Parity</i>				<0.001
1 (ref)	3453	21.6	23.0	<0.001
2-3	8257	51.6	52.7	
4+	4294	26.8	24.2	
<i>Mass media exposure</i>				<0.001
Not at all (ref)	5154	32.2	19.5	<0.001
Irregular	5459	34.1	34.6	
Regular	5391	33.7	45.9	
<i>Place of residence</i>				<0.001
Rural (ref)	11273	70.4	57.3	<0.001
Urban	4731	29.6	42.7	
<i>Region of residence</i>				<0.001
North Central (ref)	2339	14.6	17.5	<0.001
North East	2712	16.9	13.6	
North West	5016	31.3	14.7	

South East	1252	7.8	11.8	
South South	1916	11.9	15.4	
South West	2769	17.3	27.0	
<i>Community women's autonomy</i>				<0.001
Low (ref)	6968	43.5	26.9	
Medium	4673	29.2	33.3	
High	4363	27.3	39.7	
<i>Community women's education</i>				<0.001
Low (ref)	7239	45.2	22.6	
Medium	3910	24.4	37.1	
High	4855	30.3	40.3	
<i>Community poverty</i>				<0.001
Low (ref)	4535	28.3	44.1	
Medium	4830	30.2	33.2	
High	6639	41.5	22.7	

Ref = Reference category

Over two-third (61.6%) of the sample population reported that their husbands and partners made decisions regarding their own health care. More than one third of the study sample resided in North-west region (31.3%) and communities with a high proportion of educated women (30.3%). Meanwhile, 41.5% resided in communities with low level of poverty. Over one quarter (27.3%) of the sample population lived in communities with a high proportion of women who reported they make decisions alone and jointly with their husbands.

The bivariate distribution of the study sample shows that half (50.5%) aged 25-34 years had 4 or more ANC visits. Attendance of four or more ANC visits was lowest for women with no education (25.7%), women from poor wealth quintile (27.3 %) and women who were not working (25.4%). The highest proportion of four or more ANC attendance was found among women who made decisions alone or jointly with their husbands or partners. About 45.9% of the sample population who were exposed to any form of mass media regularly had at least four ANC visits. Attendance of four ANC visits was highest among women who lived in South-west (27%) and communities with a high proportion of women who made decisions alone or jointly with their husbands (39.7%).

Multilevel analysis of the effects of individual- and community-level characteristics

The multilevel analysis results as shown in Table 2 (Model 0) revealed a significant variation in ANC visits across communities as indicated by the intra-class correlation (ICC) (77%).

Table 2: Estimates from the multilevel logistic regression odds ratio for the effects of individual and community factors associated with antenatal care, Nigeria 2008 DHS

Variables	Model 0 Empty model	Model 1 Individual variables	Model 2 Community variables	Model 3 Individual & community
		Odds Ratio (95% CI)	Odds Ratio (95% CI)	Odds Ratio (95%CI)
Fixed effects				
Woman's autonomy (decision making on health care)				
Husband alone/Others (ref)		1.00		1.00
Wife alone/Jointly		1.75***(1.37-2.23)		1.32**(1.07-1.62)
Mother's age at last birth				
15-24 (ref)		1.00		1.00
25-34		1.87*** (1.41-2.49)		1.57***(1.21-2.03)
35-49		1.77***(1.25-2.51)		1.39*(1.01-1.92)
Mother's Education				
No education (ref)		1.00		1.00
Primary		4.15***(2.61-6.59)		2.59***(1.80-3.74)
Secondary/Higher		11.59***(5.54-24.24)		5.41***(3.04-9.59)
Employment				
Not working (ref)		1.00		1.00
Working		1.72***(1.33-2.21)		1.50***(1.19-1.89)
Household wealth index				
Poor (ref)		1.00		1.00
Middle		3.21***(2.13-4.83)		1.92***(1.41-2.63)
Rich		9.86***(4.85-20.03)		2.87***(1.81-4.53)
Parity				
1(ref)		1.00		1.00
2-3		0.66***(0.51-0.86)		0 .69**(0.53-0.89)
4+		0.47***(0.32-0.69)		0 .55***(0.38-0.78)
Mass media exposure				
Not at all (ref)		1.00		1.00
Irregular		1.81***(1.37-2.39)		1.85***(1.39-2.47)
Regular		3.68***(2.40-5.64)		3.42***(2.23-5.23)
Place or residence				
Rural (ref)			1.00	1.00
Urban			1.98***(1.28-3.05)	1.68*(1.10-2.56)
Region of residence				
North Central (ref)			1.00	1.00
North East			0.59*(0.35-0.98)	0 .75 (0.46-1.23)
North West			0.17***(0.08-0.35)	0 .16***(0.07-0.33)
South East			1.75*(0.98-3.14)	1.56 (0.85-2.85)
South South			0.58*(0.35-0.98)	0 .42**(0.23-0.74)
South West			8.19***(3.67-18.2)	5.89***(2.79-12.43)
Community women's autonomy				
Low (ref)				

Medium High			1.00 8.19*(1.01-2.27) 2.47*** (1.48-4.12)	1.00 1.34 (0.89-2.02) 1.75*(1.07-2.84)
Community women's education Low (ref) Medium High			1.00 7.79*** (3.50-17.33) 5.28*** (2.77-10.08)	1.00 2.82*** (1.52-5.22) 2.41*** (1.47-3.95)
Community poverty Low (ref) Medium High			1.00 0.25*** (0.14-0.45) 0.05*** (0.02-0.14)	1.00 0.53* (0.32-0.86) 0.17*** (0.08-0.37)
Random effects Parameters	<i>Empty</i>	<i>Individual</i>	<i>Community</i>	<i>Individual/Community</i>
Community level Variance (SE) VPC=ICC (%) PCV(%)	11.07*** (3.90) 77 Reference	4.60*** (1.35) 58 58.5	2.91*** (0.91) 47 73.7	2.60*** (0.81) 44 76.5
Log-likelihood	-8155.0025	-5832.6281	-7635.2902	-5591.5649
Model fit statistics AIC		11695.3	15300.6	11237.1

Ref = Reference category, SE = Standard error, VPC= Variance Partition Coefficient, PCV = Proportional change in variance, AIC= Akaike information criterion.

Significance level ***p<0.001 **p<0.01 *p<0.5

Model 1 included the individual-level autonomy and characteristics at the individual-level. The variance in ANC visits was significant and the intra-class correlation was estimated at 58 percent. The results indicate that individual woman's autonomy is strongly associated with ANC visits. For instance, women who reported that they make decisions alone or jointly with husbands regarding their health care had higher odds (OR:1.75, CI:1.37-2.23, p<0.001) of attending four or more ANC visits compared with their counterparts who reported that decisions for obtaining health care were made solely by their husbands or someone else. Similarly, all the individual-level characteristics such as mother's age (OR: 1.77, CI:1.25-2.51, p<0.001) secondary/higher education (OR: 11.59, CI:5.54-24.24, p<0.001), employment (OR: 1.72, CI: 1.33-2.21, p<0.001) household wealth index (OR: 9.86, CI: 4.85-20.03, p<0.001), higher parity (OR: 0.47, CI: 0.32-0.69, p<0.001) and mass media exposure (OR: 3.68, CI: 2.40-5.64, p<0.001) were significantly associated with ANC visits.

Community women's autonomy and other community-level factors were incorporated in Model 2. The variance in ANC visits remained significant across communities. The ICC was 47 percent. Meanwhile results indicate a significant

association between community women's autonomy and ANC visits. Living in communities with a high proportion of women who made decisions alone or jointly with their husbands increased the odds of attending four or more ANC visits (OR: 2.47, CI: 1.48-4.12, $p < 0.001$). Similarly, urban residence (OR: 1.98, CI: 1.28-3.05, $p < 0.001$), living in South-west (OR: 8.19, CI: 3.67-18.2, $p < 0.001$) and communities with a high proportion of educated women (OR: 5.28, CI: 2.77-10.08, $p < 0.001$) increased the odds of attending at least four ANC visits. However, residing in high poverty communities attenuated the odds (OR: 0.05, CI: 0.02-0.14, $p < 0.001$).

Covariates at both individual and community levels were included in Model 3 (Table 2) to assess the effects of community women's autonomy net of other covariates at individual and community levels. The findings revealed that the inclusion of all the variables at the individual and community levels reduced the effects of aggregate autonomy. For instance, the odds of attending 4 or more ANC visits slightly reduced for women who make decisions alone and jointly with their husbands (OR: 1.32, CI: 1.07-1.62, $p < 0.01$) and women residing in high autonomous communities (OR: 1.75, CI: 1.07-2.84, $p < 0.05$). Further, the result indicates a weaker effect of community women's autonomy compared to Model 2. Although there were slight reductions in the odds of ANC visit for most of the variables, all the individual and community factors in the model were significantly associated with ANC attendance.

In comparison to Model 2 the ICC was 44 percent and the proportional change in variance of 76.5 percent indicates that the differences in ANC visits across communities can be attributed to both individual and community-level factors.

The smaller value of AIC in Model 3 (Table 2) shows that the model is a better fit compared to previous models.

4. Discussion

The main aim of this study was to determine the extent to which community female autonomy and other individual- and community-level characteristics influence ANC attendance. The findings indicated that both individual and community women's autonomy were important in explaining variations in ANC visits across communities in Nigeria. For instance, the result revealed that living in high autonomous communities was associated with a higher likelihood of making four or more ANC visits compared to residence in less autonomous communities. The finding implies that, it is not only where a woman lives that matters but who her

neighbours are is also important. Hence, antenatal care attendance of women with less autonomy can be influenced by virtue of their residence in high autonomous communities. Although the mechanisms of this influence was not examined in this study, results support other studies that have demonstrated the importance of the community context on health care behaviour (Babalola and Fatusi, 2009; Gage 2007; Ononokpono et al. 2013; Tiwari, 2010). For instance, these studies revealed that living in communities, with a high proportion of women who are educated and autonomous increased the odds of antenatal, delivery and postnatal care utilization.

Residence in urban areas, South-west region and communities with a high proportion of educated women was associated with increased odds of making four or more ANC visits; whereas women residing in high poverty communities were less likely to attend four ANC visits. This advantage over women living in disadvantaged communities and regions may be attributed to higher levels of knowledge, better access to resources and health care services, given the differences in socio-economic development across different communities and regions of Nigeria (NPC and ICF Macro, 2009). This finding suggests the need for specific community and regional interventions to improve ANC attendance in the country.

At the Individual-level, a woman's autonomy, parity, household wealth index, working status and exposure to mass media were significantly associated with ANC visits. Women who made joint decisions with their husbands and those from wealthy households were more likely to attend at least four ANC visits compared to those in the reference category. The higher ANC attendance found among working women and women who were regularly exposed to mass media could be due to high level of financial control and access to flow of information on maternal health care services. In support of other studies, high parity women had lower likelihood of attending four ANC visits probably because they feel more experienced and knowledgeable from previous maternity experiences (Gabrysch and Campbell, 2009; Ochako, Fotso, Ikamari, and Khasakhala, 2011).

This study has some limitations. First, despite the fact that only the most recent birth was considered, the study may be riddled with recall bias, because, the events took place five years before the survey. Second, the study used a cross-sectional data which limits the potential causal inferences that can be drawn. Third, the community female autonomy and other community variables were constructed by aggregating the individual level characteristics at the community level, and thus some of the variables may be highly correlated. However, this problem was minimized by

conducting a collinearity test using variance inflation factor (VIF) and excluding the index woman while constructing the community variables.

Despite these limitations, the study is relevant and makes important contribution in understanding the role of aggregate autonomy in ANC attendance and adds to the cumulative evidence on the importance of community context on health care behaviour.

5. Conclusion and Recommendations

This study has demonstrated that community female autonomy is important in explaining differences in ANC visits in Nigeria. This finding indicates that interventions to address poor maternal health care behaviour in Nigeria should consider the community context in which women live. In addition, the findings suggest the need to empower women educationally and economically to enable them have access to maternal health care services. Community interventions aimed at improving ANC attendance should focus on norm change so as to improve women's status and autonomy, particularly in communities where women have little or no say in matters regarding their own health care. Further research is needed to unravel the pathways through which community-level female autonomy influences ANC visits.

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