European Journal of Public Health Studies
ISSN: 2668 - 1056
ISSN-L:2668 - 1056
Available on-line at: www.oapub.org/hlt

DOI: 10.46827/ejphs.v5i2.125 Volume 5 | Issue 2 | 2022

SOCIODEMOGRAPHIC FACTORS AFFECTING BIRTH PREPAREDNESS AND COMPLICATION READINESS AMONG PREGNANT WOMEN ATTENDING ANTENATAL CLINIC IN YENAGOA, SOUTH-SOUTH, NIGERIA

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Abstract:
Background: Maternal mortality still remains a substantial burden and hence progress towards the fifth Millennium Development Goal (MDG 5) was particularly slow. The maternal mortality ratio (MMR) in developing regions is 15 times (240/100,000 live births) higher than in developed regions (16/100,000live births). Sub-Saharan Africa had the highest MMR at 500 maternal deaths per 100,000 live births. **Objectives:** To assess the sociodemographic factors affecting birth preparedness and complication readiness amongst those attending antenatal clinics in Yenagoa metropolis. **Methods:** This was a cross-sectional descriptive study done amongst pregnant women of childbearing ages attending ANC clinics using an interviewer-administered semi-structured questionnaire. Participants were selected using a systematic random sampling technique. The data collected were analyzed using SPSS version 20. **Results:** Most of the respondents 258 (99.2%) were Christians. The majority 239 (91.9%) of the respondents were married. One hundred and thirteen (43.5%) respondents were Ijaw in their ethnic group, followed Igbo; 71 (27.3%). The majority 141 (54.2%) of respondents had a secondary level of education Socioeconomic status II had the highest frequency 97 (37.3%), then status I, 94 (36.2%) Birth preparedness and complication readiness of mothers was significantly (p <0.05) associated with mother's education, socioeconomic status and knowledge of obstetric danger signs. Birth preparedness and complication readiness of mothers were not

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significantly ($p > 0.05$) associated with the age of the expectant mother, marital status, family size, gestational age, antenatal care follow-up, number of antenatal care visits and time to the nearest health facility. **Conclusion:** Educational status, socioeconomic status and knowledge of key danger signs during pregnancy were independent predictors of birth preparedness and complication readiness. There is a need for improvement of the above factors in other to enhance birth preparedness and complication readiness.

Keywords: sociodemographic factors, birth preparedness, complication readiness, pregnant women

1. Introduction

In many developing countries including Nigeria, maternal mortality still remains a substantial burden and hence progress towards the fifth Millennium Development Goal (MDG 5) was particularly slow. Childbearing is experienced not as a joyful event as it should be. Each year, approximately 287,000 women die from complications related to pregnancy and childbirth, with 99% of these deaths occurring in developing countries. Maternal mortality has shown to have large discrepancies between developed and developing countries. The maternal mortality ratio (MMR) in developing regions is 15 times (240/100,000 live births) higher than in developed regions (16/100,000live births).[1] Sub-Saharan Africa had the highest MMR at 500 maternal deaths per 100,000 live births.[1]

Five direct complications account for more than 70% of maternal deaths: haemorrhage (25%), infection (15%), unsafe abortion (13%), and eclampsia (very high blood pressure leading to seizures – 12%), and obstructed labour (8%). A total of 99.0% of all maternal deaths occur in developing countries, where 85.0% of the population lives. While these are the main causes of maternal death, unavailable, inaccessible, unaffordable, or poor-quality care is fundamentally responsible.[1] Although patterns vary by region, high-risk births persist in Nigeria. In both 1990 and 2003, two-thirds of all births were high risk because of the mother's age, parity or spacing of births. About 40% of women giving birth do not receive prenatal care from a trained health care provider. This proportion did not improve during the 10-year period (2003 – 2013).[2] The proportion of women receiving health care from a trained provider at delivery has increased from 30% in 1990 to 37% in 2003 and to 61.0% in 2013.[2] Even so, it is still low and less than that in some other West African countries. Because of these, the Nigerian government had adopted several policies aimed at reducing maternal mortality by 75% by 2015. However, they lack effective implementation, largely because of the very low level of government spending on health care. Most programming on safe motherhood has been initiated by non-governmental organizations working with funding from international donors.

Idowu *et al.* found that the proportion of women who had BP/CR was significantly higher among those in the middle socio-economic group (51.6%, $p<0.05$), those who practiced Christianity (76.4%, $p<0.05$) and those from Yoruba ethnic group (80.1%,

p<0.05). Respondents in the lower socio-economic group were 42% less likely to have prepared for birth compared to women in the high socio-economic class (OR: 0.58, 95% CI: 0.34-0.99).[3]

A study by Markos and Bogale identified some of the factors affecting birth preparedness and complication readiness as the educational status of the women and ANC follow-up as having significant statistical association with birth preparedness and complication readiness.[4]

A cross-sectional study was conducted among randomly selected 3612 pregnant women from June to September 2012. Debelew *et al.* studied factors affecting birth preparedness and complication readiness, before running the full model, ICC (ϱ) was calculated in the empty model and it was found to be 0.554 indicating that 55.4% of the variation is contributed by cluster variation. The test of the preference of log likelihood versus logistic regression was also strongly significant (P < 0.0001). Then, the full model was run by including both the cluster level and individual level variables and the ICC (ϱ) was reduced to 0.302. This again indicated that 30.2% of the variation is attributed to cluster-level variables suggesting the preference for multilevel analysis. The preference for log likelihood versus logistic regression was again strongly significant (P < 0.0001).[5]

After adjusting for confounders in the two-level mixed-effects multilevel model, among the cluster level variables, place of residence and access to health centre were found to have a statistically significant association with BP and CR practice. Women from urban residences (OR = 6.01; 95% CI: 2.56, 14.08) and women who were from clusters (Kebeles) were found within 2 hours of travel on foot from the health centre on average (OR = 2.93; 95% CI: 1.43, 6.02) were more likely to be prepared for birth and its complications. Among the socio-demographic and economic characteristics considered as level-1, educational status, husband's occupation and wealth quintiles were found to have a statistically significant association with BP and CR practice. Women who attended primary (OR = 1.55; 95% CI: 1.24, 1.94), secondary (OR = 3.13; 95% CI: 2.00, 4.91) or tertiary (OR = 8.04; 95% CI: 2.14, 30.24) were more likely to be prepared as compared to women who didn't attend any formal education. Women having employed (OR = 1.77; 95% CI: 1.14, 2.74) or merchant husbands (OR = 2.04; 95% CI: 1.40, 2.96) were more likely to be prepared as compared to women having farmer husbands. Women in the third (OR = 1.46; 95% CI: 1.06, 2.00), fourth (OR = 1.24; 95% CI: 1.06, 1.72) or fifth (OR = 1.56; 95% CI: 1.12, 2.19) wealth quintiles were more likely to be prepared as compared to women in the lowest quintiles (poorest). Among the obstetric-related factors considered at the individual level, knowledge of key danger signs, attitude and frequency of ANC visits had a significant association with BP and CR practice. Women who knew all the four key danger signs during labour and delivery were more likely to be prepared for birth and its complications (OR = 2.04; 95% CI: 1.22, 3.39). Similarly, having favourable attitude towards BP and CR was found to increase the likelihood of preparation significantly (OR = 1.73; 95% CI: 1.37, 2.18). ANC visit was also among the strong predictors of BP and CR. Having 1-3 visits (OR = 2.12; 95% CI: 1.67, 2.69) and greater or equal to 4 visits (OR = 2.87;

95% CI: 1.98, 4.18) were found to increase the likelihood of preparation as compared to those who didn't attend ANC visit at all.[5]

2. Methods

The study was carried out in the Yenagoa metropolis which is the capital of Yenagoa Local Government Area of Bayelsa State, Nigeria. Bayelsa State is one of the 36 States, which along with the FCT, Abuja, that made up the Federal Republic of Nigeria. Bayelsa has a riverine and estuarine setting. A lot of her communities are almost (and in some cases) completely surrounded by water, hence making these communities inaccessible by road. Yenagoa lies in the south at 4°55′29″ North and 6°15′51″East. It has a total land area of 706 square kilometers and a population of 353,344 at the 2006 census.[6] Yenagoa is the traditional home of the Ijaw people. The Ijaw form the majority in Bayelsa State. English is the official language but Epie/Atissa language is the major local language spoken in Yenagoa. Yenagoa has 6 Primary Healthcare Centres, 2 secondary healthcare centres and 1 tertiary healthcare centre and many private clinics that offer antenatal services. Other services offered at these centres include Health education, immunization, family planning counselling, treatment of minor ailments and first aid, referrals, ante-natal, delivery and post-natal care services.

The study was a cross-sectional descriptive study design amongst pregnant women of childbearing age attending antenatal clinics in Government hospitals in Yenagoa metropolis. All government hospitals in Yenagoa metropolis were included in this study. The women were in their 3rd trimester of pregnancy. Pregnant women attending antenatal clinics in whom a viable outcome of the pregnancy is expected and pregnant women with a gestation period between 28 and 42 weeks at the time of data collection were included in this study. While pregnant women attending antenatal clinics that are ill-looking and pregnant women who did not give their consent were excluded from this study. The study was carried out over an 18-month period (January 2015 – June 2016).

The minimum sample size for this study was determined by using the formula for studying one proportion.[7]

$$n = \frac{z^2 pq}{d^2}$$

Where:
n = the desired sample size when the population is greater than 10,000;
z = standard normal deviate (1.96 at 95 % confidence level);
p = the prevalence or proportion of event of interest for the study;
d = degree of precision desired which is set at 5% (0.05).

In a previous study in Zaria, the knowledge of obstetric danger signs was 18.3%.[8]

Taking p to be 0.183:

q = 1.0 – p = 0.817

$$n = \frac{(1.96)^2 \times 0.183 \times 0.817}{(0.05)^2} = 229.7 \approx 230$$

Therefore, the minimum sample size was 230 respondents. To make adjustments for possible non-response, we assumed a 10% non-response, the formula for non-response rate was used:

n / (1 - nrr)

where:
n = calculated sample size = 230;
nrr = 10% non-response rate;

Therefore,

230/ (1 – 10/100) = 255.6 ~ 256;
n = 256.

However, to broaden the base of the study the total number of women who met the criteria within the study period was used, hence a sample size of 277 questionnaires was administered. A systematic sampling method was used in the selection of participants in the tertiary secondary and primary health care facilities. Hence, pregnant women attend routine antenatal clinics at the three levels of health care namely Federal Medical Centre, Yenagoa (a tertiary health facility); Diete Koki Memorial Hospital, Yenagoa (a secondary health facility); King Malla Sasime Medical Centre Igbogene, Yenagoa (a secondary health facility); Agadama-epie Health Centre, Yenagoa (a primary health centre); Yenezue-gene Health Centre, Yenagoa (a primary health facility); Opolo Health Centre, Yenagoa (a primary health facility); Amarata Health Centre, Yenagoa (a primary health facility); Azikoro Health Centre, Yenagoa (a primary health facility); Women's Affairs Clinic, Ovum, Yenagoa (a primary health facility).

Based on the average monthly ANC attendance of the different facilities, sampling proportion to size was done.

Federal Medical Centre Yenegoa average monthly ANC attendance is 210 which equates to 84 of the 260 respondents. Diete-Koki Memorial Hospital's average monthly ANC attendance is 100 which equates to 40 of 260 respondents. King Malla Sasime Hospital's average monthly ANC attendance is 20 which equates to 8 respondents. Women Affairs Clinic average monthly ANC attendance is 50 which equates to 20

respondents. Azikoro Health Centre's average monthly ANC attendance is 20 which equates to 8 respondents. Amarata Health Centre's average monthly ANC attendance is 10 which equates to 4 respondents. Yenizue–Gene Health Centre's monthly ANC attendance is 200 which equates to 80 respondents. Opolo Health Centre's average monthly ANC attendance is 10 which equates to 4 respondents. Agudama Health Centre's average monthly ANC attendance is 30 which equates to 12 respondents. Based on the average ANC monthly attendance of each health facility, the proportions of the sample size from each facility were calculated. For every 10 ANC attendance, 1 respondent was allotted.

	Health facility	**Average monthly attendance**	**Proportion**	**Total respondents allotted**
1.	Federal Medical Centre Yenagoa	210	21	84
2.	Diete Koki Memorial Hospital	100	10	40
3.	King Malla Sasime Hospital	20	2	8
4.	Women Affairs Clinic	50	5	20
5	Azikoro Health Centre	20	2	8
6	Amarata Health Centre	10	1	4
7	Yenizue-Gene Health Centre	200	20	80
8	Opolo Health Centre	10	1	4
9	Agudama Health Centre	30	3	12
	Total	**650**	**65**	**260**

At the facilities level, the first client was chosen by simple random sampling followed by systematic random sampling with every fifth client being interviewed.

Quantitative data collection was used to obtain information and data relevant to the study objectives. This was done with the aid of a semi-structured interviewer-administered questionnaire. The questionnaire consisted of open and closed-ended questions. The questionnaire for the study was pre-tested using 30 respondents in a primary healthcare facility in Gbarantoru community which is located about 8km from Yenagoa. This was done to help to reduce areas of ambiguity in the tool thereby refining the final tool for the main study. The questionnaires were then screened for completeness by the researcher, coded, entered into the IBM SPSS version 20.0 software and analyzed.

The socio-economic status of the respondents was computed based on the occupation of the respondent's spouse and the level of education of the respondents. A score of 1 was given for spouses who had skilled professions, 2 for spouses with semi-skilled profession occupations and 3 for spouses with the unskilled profession. A score of zero was given to respondents with tertiary education, 1 to respondents with secondary education and 2 to respondents with primary education or none. The addition of the scores gave a composite score for social class with the highest class being I and the least class, V.

Ethical approval to conduct this research was sought and obtained from the Federal Medical Centre, Yenagoa Hospital Research Ethics Committee (Appendix 2).

Permission was also sought from the heads of the various health facilities in Yenagoa metropolis and both verbal and written consent was obtained from the respondents and they were health educated on the obstetric danger signs. The benefit of the study to participants was the opportunity to verbalize their views on the information they got from the Antenatal care sessions.

3. Results

A total of 277 mothers were enrolled in the study and 260 (93.9%) of them consented to the study. This gives a response rate of 93.9% which cut across the levels.

The mean age was 28.4 (sd = 4.8), 29.3 (sd = 4.2), 28.5 (sd = 5.3) for respondents from primary, secondary and tertiary health care facilities respectively. Overall, the age of the subjects ranged from 16 years to 42 years (range 26 years) with a mean of 28.7 (sd = 4.8).

Table 1: Socio-demographic characteristics of the respondents

Variable	Frequency (n = 260)	Percentage (%)
Age (years)		
15 – 19	6	2.3
20 – 24	41	15.8
25 – 29	99	38.1
30 – 34	80	30.8
≥35	34	13.1
Marital status		
Single	10	3.8
Married	239	91.9
Cohabiting	11	4.2
Type of marriage		
Monogamous	235	90.4
Polygamous	4	1.5
Single or cohabiting	21	8.1
Religion		
Christianity	258	99.2
Islam	1	0.4
Traditional religion	1	0.4
Ethnicity		
Igbo	71	27.3
Ijaw	113	43.5
Yoruba	6	2.3
Ibibio	9	3.5
Urhobo	16	6.2

Anang	3	1.2
Epie/Atissa	17	6.5
Ukwuani	1	0.4
Ogbia	4	1.5
Ogoni	5	1.9
Edo	1	0.4
Kalabari	2	0.8
Igala	1	0.4
Ikwere	3	1.2
Idoma	2	0.8
Nembe	4	1.5
Ogoja	1	0.4
Ndoni	1	0.4

Almost all the women 258 (99.2%) were Christians, 1 (0.4%) Muslim and the other 1 (0.4%) Traditional Religion. The majority 239 (91.9%) of the women were married and of monogamous setting. One hundred and thirteen (43.5%) respondents were Ijaw in their ethnic group, followed Igbo; 71 (27.3%).

Table 2: Socio-economic characteristics of the respondents

Variable	**Frequency (n = 260)**	**Percentage (%)**
LOE		
None	1	0.4
Primary	17	6.5
Secondary	141	54.2
Tertiary	101	38.8
Occupation of spouse		
I	203	78.1
II	8	3.1
III	49	18.8
SES		
I	94	36.2
II	97	37.3
III	26	10.0
IV	39	15.0
V	4	1.5

The vast majority 141 (54.2%) of respondents had secondary level of education, followed by tertiary education 101 (38.8). In regard to their husbands, 203 (78.1%) were of class I status, next to class III status 49 (18.8%). Socioeconomic status II had the highest frequency 97 (37.3%), then status I, 94 (36.2%) and the least were status V, 4 (1.5%).

Table 3: Obstetric characteristics of the respondents

Variable	Frequency (n = 260)	Percentage (%)
Parity		
0	69	26.5
1 – 4	185	71.2
≥5	6	2.3
Antenatal visits		
Yes	249	95.8
No	11	4.2
Antenatal visits		
<4	110	42.3
≥4	150	57.7
Time to the nearest health facility		
2 hours or less	235	90.4
More than 2 hours	4	1.5
I don't know	21	8.1

Of the total number of mothers, 69 (26.5%) are nulliparous, the majority 185 (71.2%) had 1 – 4 children while 6 (2.3%) mothers had 5 and more children. In the case of index history of pregnancy, 249 (95.8%) had ANC follow-up, among those who had ANC follow-up, 150 (57.7%) had 4 and more visits while 110 (42.3) had less than 4 visits. The majority 239 (91.9%) of the mothers know the distance of their home from the nearest health centre, among these categories, 235 (90.4%) have 2 hours or less distance from home to the nearest health centre and whereas 4 have more than 2 hours distance from home to the nearest health centre.

Table 8: Association of selected socio-demographic and obstetric factors of respondents with preparation for birth and its complication in Yenagoa

Variable	The practice of birth preparedness & its complication		χ^2	*p* value
	Not prepared n (%)	Prepared n (%)		
Age				
15 – 24	11 (17.5)	36 (18.3)	0.141	0.932
25 – 30	34 (54.0)	101 (51.3)		
>30	18 (28.6)	60 (30.5)		
Marital status				
In marital union	58 (92.1)	181 (91.9)	0.002	0.963
Not in marital union	5 (7.9)	16 (8.1)		
Mother's LOE			16.727‡	<0.0001
None	0 (0.0)	1 (0.5)		

Primary	1 (1.6)	16 (8.1)		
Secondary	24 (38.1)	117 (59.4)		
Tertiary	38 (60.3)	63 (32.0)		
SES				
I	38 (60.3)	56 (28.4)		
II	15 (23.8)	82 (41.6)	21.888	<0.0001
III	3 (4.8)	23 (11.7)		
IV	7 (11.1)	32 (16.2)		
V	0 (0.0)	4. (2.0)		
Family size				
0	21 (33.3)	48 (24.4)	3.115‡	0.183
1 – 4	42 (66.7)	143 (72.6)		
≥5	0 (0.0)	6 (3.0)		
Gestational age	35.7	35.1	0.375†	0.708
Antenatal care follow-up				
Yes	59 (93.7)	190 (96.4)	0.360*	0.548
No	4 (6.3)	7 (3.6)		
No. of antenatal visit				
<4	27 (42.9)	83 (42.1)	0.010	0.919
≥4	36 (57.1)	114 (57.9)		
Time to the nearest health facility	43 (76.8)	138 (79.3)	0.161	0.688
≤2	13 (23.2)	36 (20.7)		
>2				
Knowledge of danger signs				
Yes	38 (60.3)	81 (41.1)	7.090	0.008
No	25 (39.7)	116 (58.9)		
Ethnicity				
Bayelsa	44 (69.8)	128 (65.0)	0.505	0.477
Non Bayelsa	19 (30.2)	69 (35.0)		

* χ^2 with Yates correction; ‡ Fisher's Exact Test † t test

Birth preparedness and complication readiness of mothers were significantly (p <0.05) associated with the mother's education, socioeconomic status and knowledge of obstetric danger signs. Birth preparedness and complication readiness of mothers was not significantly (p > 0.05) associated with the age of the expectant mother, marital status, family size, gestational age, antenatal care follow-up, number of antenatal care visits and time to the nearest health facility.

4. Discussion

Based on this study, birth preparedness and complication readiness of mothers were significantly associated with the educational status of the women, socioeconomic status and knowledge of danger signs. This was in keeping with the study by Markos and Bogale[4] that also identified educational status as being significantly associated with BP/CR. This finding is also supported by another community-based study done in Adigrat town, North Ethiopia.[9] The implication of this finding could be when women become educated, they might have better access to information from different sources like from reading different materials.

This study did not find a significant relationship between age of expectant mother, marital status, family size, gestational age, antenatal care follow-up, number of visits or time to nearest health care facility to BP/CR, unlike the Debelew and colleagues[5] that found time to the nearest healthcare facility (within 2 hours) as being significantly associated with BP/CR.

5. Conclusion

Findings from this study showed that educational status, socioeconomic status and knowledge of key danger signs during pregnancy were independent predictors of birth preparedness and complication readiness.

Funding Statement
This research work was sponsored by the authors, there is no external funding.

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Conflict of Interest Statement
There is no conflict of interest among the authors, they all contributed equally to the research.

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