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■ Original Research Article

Birth Preparedness and Complications Readiness among Antenatal Clinic Attendees in a Southern Nigeria Capital City: Findings across Tiers of Healthcare

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ABSTRACT

Introduction: Birth Preparedness and Complication Readiness is one of the vehicles for attaining positive pregnancy experience by planning for normal birth and actions needed in the event of an emergency. We assessed women`s plans concerning their index pregnancy. **Methodology:** This was a multi-center-descriptive cross-sectional study designed to assess birth preparedness and complications readiness among 289 pregnant women attending 3 different antenatal clinics across the 3 tiers of healthcare in Uyo, South-south Nigeria. **Results:** The mean age of Respondents was 27.8 + 6.6 years (range 15-49 years). Most (87.2%) had heard of birth preparedness, mainly from health facilities (83.7%). The majority (72%) had a good level of knowledge of the components. Most of them had received advice on birth preparedness (85.1%), identified a skilled birth attendant (79.6%), saved money (85.8%) for delivery, and identified a means of transport to the hospital (79.6%) in the index pregnancy. The Respondents' BPCR in identifying a place for delivery was significantly associated with their level of education (X^2 =12.156, P=0.004) and having heard of BPCR (X^2 =7.944, P=0.020), but not with while their age (X^2 =0.059, P=0.808) and the tier of the healthcare facility (X^2 = 0.4719, P= 0.790). **Conclusions:** Pregnant women in Uyo were mostly prepared for birth and complications which was related significantly to their educational status but independent of their age and the tier of the healthcare facility. There is a need to upscale antenatal education to translate preparation into action and discourage care with unskilled birth attendants as well as replicate the study in rural settings.

Keywords: Birth preparedness, Complications readiness, Knowledge, Practice

INTRODUCTION

The World Health Organization (WHO) prioritizes the improvement of maternal and girl child health and advocates for a reduction in the prevailing high maternal and perinatal mortality rate. About 303, 000 women and adolescent girls died in 2015 from pregnancy and childbirth-related conditions.[1] The global maternal mortality ratio (MMR) estimate for 2017 was 211 maternal deaths per 100,000 live births representing a 38% decline in the MMR from the year 2000 estimate of 342 maternal deaths per 100, 000 live births.[2] Most of these deaths occur in low- and middle-income countries.[1,2] Although, the number of pregnancy and childbirth-related deaths in 2017 was lower at approximately 295,000 compared to 451,000 maternal deaths in 2000, the maternal mortality rate is still unacceptably high.[2]

The main goal of the WHO-recommended antenatal care services is a positive pregnancy experience which translates to a satisfied, well and happy mother, and a healthy baby.[3] The concept of Birth Preparedness and Complication Readiness (BP/CR) is one of the vehicles required for attaining this desired positive pregnancy experience. Birth preparedness and complications readiness(BP/CR) is one of the components of the previously adopted 2002 WHO-focused antenatal care (FANC) defined as the process of planning for normal birth and anticipating the actions needed in the event of an emergency.[4] By extension, emergency planning helps the woman, her family, the community, the health facility, and the health provider to identify and agree on all the actions needed to take place quickly in an emergency.[4,5] The interventions in BP/CR increase the use of skilled care at birth, timely use of facility care for obstetric and neonatal complications and also help to reduce the negative[

Low- and middle-income countries, including those in Africa, account for 94 to 99% of maternal deaths with MMR ranging from 53 per 100, 000 live births in Seychelles to 1150 per 100, 000 live births in South Sudan. [1,2] Although, BP/CR interventions aim to reverse this trend, the uptake of these interventions is poor especially among the low- and middle- income countries. A meta-analysis and systematic review of 20 cross-sectional studies in Ethiopia revealed that the level of education of respondents correlated positively with BP/CR.[8] Two multicentric, meta-analyses and systematic reviews of only randomised controlled trials (RCTs) on the one hand, and RCTs with other quasi-experimental studies, on the other hand, portrayed the benefits of BP/CR interventions in improving maternal and neonatal health in developing countries. [7,9]

Nigeria has one of the highest MMR in Africa estimated at 917 maternal deaths per 100,000 live births.[2] Two retrospective studies carried out in the University of Uyo Teaching Hospital (UUTH), Uyo, Akwa Ibom state, estimated the MMR to be 2577 per 100, 000 live births and 1062 per 100, 000 live births respectively.[10,11] Although, there was an almost 59% decline in the trend of maternal deaths in between these two studies, the quoted figures still exceeded the respective prevailing National MMR during the reviews. The two studies consistently discovered that hypertensive diseases in pregnancy, late presentation for care at the facility, and the un-booked status of women were the major risk factors for maternal death. Effective BP/CR interventions are likely to mitigate these risk factors.[7]

The focus of our study was to determine the knowledge of antenatal clinic clients across the three tiers of healthcare facilities in Uyo metropolis on the concept of BP/CR to assess their preparedness for birth and complications in their index pregnancy. The Specific objectives were to determine the level of knowledge of pregnant women on BPCR; assess the practice and factors associated with it and determine any association between preparedness for birth and the Tier at which antenatal care was being received.

MATERIALS AND METHODS

Study Area/Centres: First created as a province in 1959, Uyo is currently the headquarter of the Uyo local government area which is one of the 31 Local Government Councils that makeup Akwa Ibom State, in Southern Nigeria. It lies between latitude 5.05^0 North and Longitude 80^o East, doubles as the Akwa Ibom State capital, and had a total population of 309,573 people as of the 2006 National census.

From the records of the Nigeria Health Facility Registry (HFR) of the Federal Ministry of Health, 87 of the 817 health facilities in Akwa Ibom state are sited in Uyo: 28 of which are privately owned while 59 are public; and operating at different tiers of the delivery chain.[12] The hospitals and clinics in Uyo include 2 tertiary hospitals, viz the University of Uyo teaching hospital and the Ibom Multi-specialty

Hospital; 58 Secondary and 27 primary health centres. Most Secondary health facilities in Uyo are privately owned and situated within the urban area.

For this study, three public health facilities were selected within Uyo Metropolis to represent the 3 tiers/levels of healthcare services with consideration of high patronage for antenatal care (ANC) services. These include one tertiary health facility, the University of Uyo Teaching Hospital (UUTH), one secondary health facility, St. Luke's Hospital, Anua (SLHA), and a primary health care (PHC) facility, PHC operational base, Wellington Bassey Way, Uyo.

*Study design***:** A descriptive cross-sectional study design was used to assess the level of preparedness for birth and readiness for complications among pregnant women attending antenatal clinics in Uyo, South-south Nigeria in June 2018.

*Study population***:** The population studied was pregnant women attending the antenatal clinics (ANCs) of the designated health facilities in Uyo, Akwa Ibom State, South-south Nigeria during the study period.

*Sample size***:** The minimum sample size for this study was made up of 299 pregnant women. This was determined using a previous study in Imo state, Nigeria, 2017 with 77.0% of good knowledge on BPCR among pregnant women.[13]

The formula below was used to determine the minimum sample size for the study:

Fisher's formula [14]: $n = \frac{z^2pq}{d^2}$

Where: n = minimum sampling size

z = standard normal deviate, usually constant given as 1.96

p = prevalence of the factor from previous study p = 77.0% =77.0/100, p = 0.77

q = probability of something not happening (given as 1- p, 1- 0.77, q = 0.23

d = degree of precision was (given as 0.05^2)

By Substitution, $n = \frac{1.96^2 (0.77x0.23)}{(0.05)^2} = 272.12 = 272.$

Allowing for a 10% no response rate n = 27.2+ 272 = 299.2 = 299 Therefore, the minimum sample size of 299 was targeted for the study.

Sampling technique: A purposive sampling technique was employed to recruit 300 respondents into the study comprising of 154 from UUTH, 97 from SLHA, and 49 from the PHC facility, based on the ratios of total antenatal attendees of the previous year in each of the selected hospitals. At each antenatal clinic during the study in the selected public health facilities in Uyo Metropolis, a trained assistant gives an overview of the research and procedure during the session on Health talk with the assurance of confidentiality. The women were recruited serially and purposively as every pregnant woman who opted to partake in that facility was given a questionnaire and guided without interference to complete same. This was repeated at each center and consecutive clinics until the measured sample size was obtained for the center.

Inclusion and Exclusion criteria: Pregnant women attending the Antenatal clinics in the selected facilities that were willing to participate in the study were included while pregnant women who were unable to communicate, that can neither read nor write, and those who declined consent as well as women present at the center for reasons other than antenatal care were excluded from the study.

*Data collection tool***:** The tool for this research was a structured questionnaire designed purposely for the study. The questionnaire is a modification of the John Hopkins Program for international education in Gynaecology and Obstetrics (JHPIEGO) tool for monitoring BPCR [15] and has 28 items. The questionnaire has four sections A, B, C, and D. Section A captured the respondents' socio-demographic data, Section B consisted of questions that revealed the knowledge of BPCR, Section C captured knowledge on some danger signs of pregnancy, labour, and postpartum and Section D consisted of the practice of BPCR among pregnant women. The questionnaire was pretested with similar population in another facility outside the local government area.

*Data collection procedure***:** The questionnaires were administered by trained interviewers at the centers, while returned copies of the questionnaires were retrieved the same day after validation for completeness and screening for errors.

Data analysis: Data were cleaned, entered, and analyzed using Statistical Package for Social Sciences (SPSS) for windows version 22.0. Results were presented in tables and charts. Descriptive statistics (mean and standard deviation) was performed for continuous variables and categorical using proportions. A Chi-square test was used to test for association between two variables and the level of significance was set at $P < 0.05$.

Ethical clearance: This was obtained from the hospital ethical committee through the Coordinator of Community Health Officers' Training School, the University of Uyo Teaching Hospital, Uyo.

Limitation of the study: Information on BPCR among pregnant women was subjective based strictly on what the pregnant women reported. The volunteered practices were not observed to verify the information.

RESULTS

Out of the 300 questionnaires distributed, 11(3.7%) were wrongly or incompletely filled and considered invalid, leaving 289(96.3%) which were subsequently analyzed. The Age of respondents ranged from 15-49 years with a mean age of 27.8 ± 6.6 years. The number of children by respondents ranged from 0 to 6 with a mean of 2.2 ±1.6. A greater proportion of respondents (84.1%) were less than 35 years. Almost all were Christians (96.5%), while more than half (56.8%) were Ibibios, and the same proportion completed post-secondary education (56.8%). Most of the respondents (38.4%) were civil servants. (Table 1).

The majority had between one and four previous childbirths (75.1%), were in their second trimester (45.8%) and had their last delivery either in the hospital (51.8%) or a primary health centre (37.0%). However, about 10% of respondents had their last delivery either with a traditional birth attendant (5.1%), at home (2.9%), or in a church (2.2%). (Table 2)

Most (87.2%) had heard of the term BPCR and hospitals/PHCs were their first source of information on it by a vast majority (83.7%).

Most (72%) had a good level of knowledge of BPCR. More respondents (56.4%) reported that their communities do not assist women during pregnancy.

Table 1 Socio-demographic Characteristics of Respondents

Characteristics	Frequency	Percent
Age group (in years)		
Less than 35	243	84.1
35 and above	46	15.9
Religion		
Christianity	279	96.5
Moslem	6	2.1
Traditional Worshippers	4	1.4
Ethnic Group		
Ibibio	164	56.8
Annang	6	22.8
Oron	46	15.9
Others	13	4.5
Level of education		
Primary	27	9.3
Secondary	93	32.2
Postsecondary	164	56.8
No formal education	5	1.7
Occupation		
Civil servants	111	38.4
Unemployed	82	28.4
Farmer	26	9.0
Housewife	54	18.7
Others	16	5.5
Total	289	100

Table 2: Obstetrics Characteristics of Respondents

Characteristics	Frequency	Percent
Number of children		
0	51	17.6
1-4	217	75.1
>4	21	7.3
Gestational Age (Trimesters)		
First	99	34.2
Second	132	45.8
Third	58	20.0
Place of last delivery		
Hospital	150	51.9
PHC	107	37.0
TBA	15	5.2
Home	8	2.8
Church	6	2.1
Others	3	1.0

However, providing transport (50.7%) to help pregnant women was the commonest way communities assist pregnant women.

Table 3: Knowledge of Birth Preparedness and complications Readiness

Characteristics	Frequency	Percent
Ever Heard of BPCR		
Yes	252	87.2
No	32	11.1
Don't Know	5	1.7
First Source of information on BPCR(n=252)		
Hospitals/PHCs	211	83.7
Friends	17	6.8
Church	9	3.6
Radio/TV	7	2.8
Others	8	3.2
Level of Knowledge of BPCR		
Poor	81	28.0
Good	208	72.0
Community assist women prepare for birth		
Yes	98	33.9
No	163	56.4
Don't know	28	9.7
***Ways Community Assist Pregnant Women (98)**		
Transport	71	50.7
Finance	32	23.4
Blood donation	17	12.3
Others	23	16.4
***Reasons why women don't deliver in Health Facility**		
Health workers attitude	91	32.4
Cost	126	44.1
Distance to Health facility	69	24.1
Poor quality of care	28	9.8
Others	10	3.5

*Some women provided more than one answer

High cost of delivery (44.1%) and Health workers` attitude (32.4%) were the commonest reasons given why women don't deliver in health facilities. (Table 3).

Most of the respondents (85.1%) had been advised on birth preparedness in the index pregnancy. The majority (72.6%) had identified a place of birth/skilled birth attendant and a greater proportion (85.8%) had saved money for the delivery of index pregnancy.

Table 4: Level f Practice of BP/CR by Respondents

Characteristics	Frequency	Percent
Received advice on BPCR in index Pregnancy		
Yes	246	85.1
No	43	14.9
No. of times ANC received		
Never attended	39	13.5
One	56	19.4
Two	77	26.6
Three	44	15.2
Four	73	25.2
Gestational Age when ANC Commenced (trimesters)		
First	116	40.1
Second	127	43.9
Third	46	15.9
Health Worker first seen in this pregnancy		
Doctor	93	32.2
Health worker	98	33.9
Midwife	74	25.6
TBA	22	7.6
Others	2	0.7
Preferred place to go if complications/problems develop		
PHC/Hospital	251	86.9
TBA	22	7.6
Church	14	4.8
Chemist	2	0.7
Preferred Place of Delivery		
Health facility	246	85.1
TBA	23	8.0
Church	13	4.5
Home	4	1.4
Others	3	1.0
Have you identified a place of delivery/ skilled birth attendant in the index pregnancy?		
Yes	230	79.6
No	59	20.4
Saved money in preparation for childbirth		
Yes	248	85.8
No	41	14.2
Identified means of transport to hospital		
Yes	230	79.6
No	59	20.4

Table 5: Association between selected Factors and Practice of BPCR

Factors	Identified Place of Delivery/SBA in index Pregnancy		Total	Statistical tests and Values
	Yes n(%)	No n(%)		
Age group(in years)				X^2=0.059
Less than 35	194 (84.4)	49 (83.1)	243 (84.1)	P=0.808
35 and above	36 (15.7)	10 (17.0)	46 (15.9)	
Level of education				X^2=12.156
Primary	18 (7.8)	9 (15.3)	27 (9.3)	P=0.004*
Secondary	67 (29.1)	26 (44.1)	93 (32.2)	
Tertiary	142 (61.7)	22 (37.3)	164 (56.8)	
No formal education	3 (1.3)	2 (3.4)	5 (1.7)	
Heard of BPCR				X^2=7.944
Yes	207 (90.0)	45 (76.3)	252 (87.2)	P=0.020*
No	20 (8.7)	12 (20.3)	32 (11.1)	
Don't Know	3 (1.3)	2 (3.4)	5 (1.7)	
Knowledge of Maternal complications after birth				X^2=0.892
Poor			227 (78.6)	P=0.345
Good	178 (77.4)	49 (83.1)	62 (21.5)	
	52 (22.6)	10 (17.0)		

*Significant association

Table 6: Association between Tier of Healthcare and Practice of BPCR

Tier of Healthcare	Identified Place of Delivery/SBA in index Pregnancy		Total	Statistical tests and Values
	Yes n (%)	No n (%)		
Primary (PHC, Barracks Road, Uyo)	37(77.8)	10(22.2)	47	X^2 =0.4719 P= 0.790
Secondary (SLHA, Uyo)	76(82.9)	16(17.1)	92	
Tertiary (UUTH, Uyo	119(79.6)	31(20.4)	150	

The practice of identification of a place for delivery in the index pregnancy as a measure of BPCR was significantly associated with Respondents' level of education (X^2 =12.156, P=0.004) and having heard of BPCR (X^2 =7.944, p=0.020). while age (X^2 =0.059, P=0.808) and level of Most (79.6%) had identified a means of transport to the hospital for index pregnancy. (Table 4). Knowledge of complications after childbirth (X^2 =0.892, P =0.345) were not associated with respondents' BPCR (Table 5). The practice of identifying a place of delivery/ skilled birth attendant in index pregnancy was not significantly associated with the tier or level of healthcare for antenatal care (X2 =0.4719, P= 0.790). (Table 6).

DISCUSSIONS

Most clients recruited in this study had heard of birth preparedness and complications readiness (BPCR), mainly from hospital settings and the knowledge of its constituent elements of antenatal, intrapartum, postpartum, and neonatal care as defined in the JHPIEGO tool,[16] was good. This was similar to findings from an Ethiopian study where the majority (72.2%) heard about the term BPCR and their source of information was health care providers (82.9%).[17] A similar study in Bamenda district, Cameroon however showed a poorer awareness of BPCR at 46.1%.[18] These variations may be a product of the differences in the levels of education of the studied populations, their parities, and previous antenatal care utilization as well as the degree/extent of inclusion of BPCR counselling in the antenatal care health talks in the facilities attended.

Our study was carried among a young population with 84.1% below 35 years. The preponderant religion was Christianity while there were more Ibibios than the other ethnic groups which seem to be in keeping with the socio-demographic characteristics of the population studied. Most of the respondent had received advice on BPCR in the index pregnancy and the level of preparedness for birth was good as an average of 79.3% had identified a skilled birth attendant (SBA), saved money in preparation for childbirth, and identified a means of transportation to their chose health facility.

This was similar to findings in Thailand where 78.6% of their pregnant women showed a good BPCR.[19] However, studies on BPCR in Southwest, Nigeria, and Bangladesh revealed a relatively lower preparation for birth at less than 50 and 15 percent respectively.[20,21]This was also the pattern in Ethiopia and Cameroon where only 24.1% and 18.8% of pregnant women respectively were considered prepared for childbirth.[17,18] In Abakiliki, Nigeria, a low birth preparedness index was found as only 44.9% and 36.9% of the studied population had adequate knowledge of birth preparedness and complication readiness respectively.[22] The better preparedness of our respondents for birth may be

a function of their obstetric characteristics as more than 80% have had at least a previous childbirth and in either a primary health centre or hospital; had attended ANC at least once in the index pregnancy. They, thus most likely may have benefitted from BPCR counselling during either any of the previous pregnancies or the index pregnancy. The birth preparedness of respondents was not affected by socio-demographic parameters of the respondents such as age, religion, and ethnicity in this study.

Formal education was an essential asset to acquiring knowledge on birth preparedness and key danger signs of pregnancy and childbirth. [8,20] Almost all the respondents here had received some formal education. This was reflected in their preference for hospital delivery in their last pregnancy. Also, because of information possibly obtained during their last pregnancy, about four-fifths of these women booked in the previous pregnancy and earlier in the index pregnancy with 40.1% and 43.9% booked in the first and second trimesters respectively. This practice is likely to increase their uptake and utilization of antenatal care services.[3] This study showed that the level of education was significantly associated with the strategies and practice of BP/CR. This observation was consistent with findings in a similar study carried out in Edo State, Nigeria.[20] Other researchers also found that women having secondary education and higher were 6.20 times more likely to be prepared than illiterates for childbirth and complications, and a diploma or a bachelor's degree were significant predictive factors for good BPCR.[17,19] This study also observed that a majority of the women (92.8%) had 4 children or less. This is below the national total fertility rate (TFR) of 5.5births per woman but corresponds to the 4.3 in South-south Nigeria reported in the Nigerian national demographic and health survey.[23] It is likely that the formal education acquired by the women, the availability and uptake of family planning and contraceptive services may be responsible for the predominant TFR of 4 in the population studied.

In this study, the respondents` level of education, having heard of BPCR, knowledge of labor, and childbirth were significantly associated with the practice of identification of a place for delivery in the index pregnancy. A study in Ife, Southwestern Nigeria, revealed that the socio-economic status of respondents was an important factor that the influenced BP/CR of respondents.[24] High cost of accessing care in the hospital was the commonest reason given that may discourage women from utilizing skilled birth attendants in our study. This may be attributed to a low socio-economic status as only about one-third of the respondents were gainfully employed and account for why about 10% and 5% preference for the unskilled attendant at last childbirth and index pregnancy respectively. The tier or level of healthcare for antenatal care was not significantly associated with the practice of identifying a place of delivery/ skilled birth attendant in the index pregnancy. This may be due to the location of these facilities as they are all within the heart of the town and associated exposures.

In conclusion, our study demonstrated good knowledge and practice of BP/CR strategies by the respondents which were significantly associated with their educational status manifesting in their preferred choice of skill birth attendance for delivery and complications in the index pregnancy but were independent of their age and the tier of the healthcare facility. This practice when translated to actions will reduce maternal and perinatal morbidity and mortality. However, a few are still uninformed, unprepared and would deliver in an unorthodox setting by unskilled personnel. There is the need to upscale our antenatal reach and counselling on BPCR to translate these plans into action and ensure all women benefit from it as well as all-inclusive health insurance to mitigate the cost of care and other deterrents. There is need to replicate this study in clinics especially among rural women receiving care in health centers to ascertain the true state of birth preparedness and complications readiness in Akwa Ibom state and South-south Nigeria at large.

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