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Knowledge, Perception and Practice of Birth Preparedness and Complication Readiness among Pregnant Women Attending a Tertiary Healthcare Facility in Sokoto, Nigeria

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Authors' contributions

This work was carried out in collaboration between all authors. Authors EUY, KJA and KT gave the study concept and design, and drafted the manuscript. Authors RM, AMD and MG gave the study concept and design, and performed data collection, analysis and interpretation. All authors read and approved the final manuscript.

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ABSTRACT

Introduction: Maternal mortality is a global public health challenge; developing regions account for approximately 99% (302,000) of the global maternal deaths in 2015, and sub-Saharan Africa alone accounts for roughly 66% (201,000), followed by South Asia (66,000). Birth preparedness has been identified as an effective intervention for reversing the prevailing trend. This study aimed to determine the knowledge, perception and practice of birth preparedness and complication readiness (BP/CR) among pregnant women in Sokoto, Nigeria.
Methods: A cross-sectional study was conducted among 408 pregnant women (selected by systematic sampling technique) attending antenatal care (ANC) clinic of Usmanu Danfodiyo University Teaching Hospital, Sokoto, Nigeria. Data were collected with a set of pretested

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interviewer- administered, semi-structured questionnaire. Data analysis was done using IBM SPSS version 20 statistical package.

Results: The mean age of the respondents was 27.6 ± 5.1 years. Majority, 364 (89.2%) of the 408 respondents had good knowledge of BP/CR, but the proportion of respondents with good knowledge of BP/CR was significantly higher among the urban residents (91.2%) as compared to the rural residents (76.4%), $\chi^2 = 10.917$, $p = 0.001$. Most of the respondents perceived the need for a pregnant woman and her family to observe the various BP/CR practices. Most of the respondents 375 (92.0%) had good practice of BP/CR, as they observed the various BP/CR practices such as, choice of place of delivery 339 (83.1%), making arrangement for transportation for ANC visits and delivery 329 (80.6%), and saving money for emergencies 330 (80.9%). The proportion of respondents with good practice of BP/CR was also significantly higher among the urban residents (94.1%) as compared to the rural residents (78.2%), $\chi^2 = 16.120$, $p < 0.001$.

Conclusion: This study showed good knowledge, perception of need, and good practice of birth preparedness and complication readiness among the respondents, but significant disparities exist between the rural and urban residents. Governments should make concerted efforts to bridge the gap in the knowledge and practice of BP/CR between the rural and urban residents by addressing the prevalent inequalities in access to information and healthcare services between the rural and urban populations of their countries.

Keywords: Birth preparedness; complication readiness; knowledge; perception; practice; pregnant women.

1. INTRODUCTION

Maternal mortality is a global public health challenge, with more than 500,000 women dying each year due to pregnancy and childbirth-related complications, and about 830 women dying from pregnancy or childbirth-related complications around the world every day. The highest maternal mortality rates are in Africa, with a lifetime risk of 1 in 16; almost all of these deaths occurred in low-resource settings, and most could have been prevented [1]. Developing regions account for approximately 99% (302,000) of the global maternal deaths in 2015, and sub-Saharan Africa alone accounts for roughly 66% (201,000), followed by South Asia (66,000). At the country level, Nigeria and India were estimated to account for over one-third of all maternal deaths worldwide in 2015, with an approximate 58,000 maternal deaths (19%) and 45,000 maternal deaths (15%) respectively. Every minute, the loss of a mother shatters a family and threatens the well-being of the surviving children; and for every woman who dies 20 or more experience serious complications [2]. Maternal mortality is believed to occur from risks attributable to pregnancy and child birth, as well as from unavailability and poor quality of health services [3].

Birth preparedness and complication readiness (BP/CR) essentially involve planning for normal birth and anticipating the actions needed in case of an emergency. Responsibility for BP/CP must be shared among all safe motherhood stakeholders (policy-makers, facility managers, providers, communities, families, and women) because a coordinated effort is needed to reduce the delays that contribute to maternal and newborn deaths [4]. The entry point for BP/CR is routinely through the antenatal care (ANC) services which the woman is expected to attend (based on schedules determined by the stage of the pregnancy) for comprehensive screening, prevention and care. ANC is usually provided at the primary healthcare level as a part of a basic package of maternal healthcare. During the first visit the mother is taken through the BP/CR concept [4].

The standard elements of BP/CR include knowledge of the danger signs, choosing a birth location and provider, knowing the location of the nearest skilled provider, obtaining basic safe birth supplies, and identifying someone to accompany the woman [5]. They also include arranging for transportation, money and a blood donor [6]. Birth preparedness has been globally endorsed as an essential component of the safe motherhood programs designed to reduce delays in care. It is believed that awareness of the danger signs of obstetric complications by pregnant women and in their communities would facilitate early decision-making and acceptance of appropriate and timely referral for essential obstetric and newborn care; and thus reduce the first and second phases of the delays that contribute to maternal mortality [3]. In many

societies in the world, cultural beliefs and lack of awareness inhibit preparing in advance for the delivery of the expected baby. Since no action is taken prior to the delivery, the family tries to act only when labor begins; and only a minority of pregnant women and their families know how to recognize the danger signs of complications. When complications occur, the unprepared family will waste a great deal of time in recognizing the problem, getting organized, getting money, finding transport and reaching the appropriate referral facility [7]. It has been recommended that pregnant women should have a written plan for birth and for dealing with unexpected adverse events, such as complications or emergencies, that may occur during pregnancy, childbirth or the immediate postnatal period; and should discuss and review this plan with a skilled attendant at each ante-natal assessment, and at least one month prior to the expected date of birth [8].

Several studies conducted in Asia and sub-Saharan Africa reported poor knowledge and practice of birth preparedness and complication readiness, with wide variations across continents and within countries. A study conducted in West Bengal, India, reported that while only 37.2% of women were aware of at least one complication of pregnancy, 58.3% knew at least one key component of essential newborn care [9]. Another study conducted in Cham Wino district of Tanzania, reported that 68.7% of the respondents were not able to mention obstetric danger signs in any of the three phases. Only 23.6%, of the respondents were able to mention at least a total of five key danger signs in all three phases and considered as knowledgeable on the key danger signs during pregnancy, childbirth and postpartum [10]. Reports from previous studies in Nigeria also showed wide variations in the knowledge and practice of birth preparedness and complication readiness across the country. While a study in Lagos, Nigeria, reported that most of the respondents knew the three signs of labor presented in the research tool, and the knowledge of drainage of liquor was highest (83.2%), followed by passage of show (65.3%), and regular intermittent abdominal pain (64.3%) [11]; another study in Umuahia, Nigeria, reported poor knowledge of the key danger signs [12].

Findings from studies across Asia and sub-Saharan Africa also showed generally poor birth preparedness and complication readiness practices, similar to the findings on knowledge. The study in West Bengal, India, revealed that the proportions of women who had their first ANC within first trimester, saved money, identified vehicle for emergency transport, and made preparation for a blood donor beforehand were 50.4%, 40.8%, 27.3%, and 9.6%, respectively [9].

Another study in Duguna Fangu district of Ethiopia, reported that only 10.7% of pregnant women identified a skilled provider, 43.6% identified a health facility for delivery and/or for obstetric emergencies, 54.1% of families saved money for incurred costs of delivery and emergency if needed, 18.1% arranged transportation to the health facility, and only 3.0% prepared for a compatible blood donor [13]. A study conducted in Edo state Nigeria, revealed that 54.3% of respondents had identified means of transportation to the health facility in the event of an emergency, 11.3% of respondents had money kept aside for payment for emergency services, but only 4.3% of respondents had identified a potential blood donor. Also, a larger proportion of respondents (49.1%) listed their spouse as the most likely accompanying persons, while 28.6%, 13.2% and 9.1% made arrangements with relatives, neighbors and friends respectively [12]. Another study in Lagos, Nigeria, showed that majority of the respondents (84.0%), planned to deliver at the same facility in which their pregnancies were being supervised, and 65.1% of the respondents made their choice of place of delivery known to their doctors. Also, a majority of respondents (83.6%) made plans for transportation during labor, 82.1% had saved money for delivery, and 26% of the respondents had obtained the telephone number of a doctor or midwife who could be contacted should the need arise [11]. Documented evidence has shown a positive impact on pregnancy and birth outcomes when the woman feels in control of the process of pregnancy and birth; thus, making a birth plan has been shown to facilitate this feeling of self-control and autonomy [14]. This study was conducted to assess the knowledge, perception and practice of birth preparedness and complication readiness among pregnant women attending a tertiary healthcare facility in Sokoto, Nigeria. The findings would be invaluable in designing strategies for bridging identified gaps in knowledge and also facilitate appropriate birth preparedness and complication readiness practices among pregnant women and their families.

2. MATERIALS AND METHODS

This cross-sectional descriptive study was carried out among pregnant women attending antenatal care (ANC) clinic of Usmanu Danfodiyo University Teaching Hospital, Sokoto, Nigeria, in October and November 2016. All pregnant women of gestational age of 16 weeks and above that presented at the ANC clinic for booking during the period of the study were considered eligible for the study. Pregnant women in labor and those with emergency conditions were excluded. The sample size was estimated at 408 using the Fisher's formula for calculating the sample size for descriptive studies [15], a 60.4% prevalence of birth preparedness among antenatal clients from a previous study [16], a precision level of 5%, and an anticipated response rate of 90%. The eligible participants were selected by systematic sampling technique. One of 3 consecutive pregnant women presenting at the ANC clinic was selected until the required sample size was obtained.

A semi-structured, interviewer-administered questionnaire was developed and used to obtain information on respondent's socio-demographic characteristics, knowledge, perception and practice of birth preparedness and complication readiness. The questionnaire was reviewed by researchers in the Department of Community Health, Usmanu Danfodiyo University, Sokoto, Nigeria to ascertain content validity. It was pretested on 20 pregnant women attending ANC clinic at Specialist Hospital Sokoto, Nigeria (another tertiary healthcare facility within Sokoto metropolis). Some questions were rephrased for clarity based on the observations made during the pretesting. Six final year medical students assisted in questionnaire administration after pre-training on conduct of survey research, the objectives of the study, and questionnaire administration. Ethical clearance was obtained from the Ethical committee of Usmanu Danfodiyo University Teaching Hospital, Sokoto, Nigeria. Permission to conduct the study was obtained from the Management of the hospital and the Head of Department of Obstetrics and Gynecology. Informed written consent was also obtained from the participants before data collection.

Data were analyzed using the IBM Statistical Package for Social Sciences (SPSS) version 20. Respondents' knowledge of birth preparedness was scored and graded on a 7-point scale. One point was awarded for a correct response, while a wrong response or a non-response received no points. This gives a minimum score of '0' and a maximum score of '7' points. Those that scored $\geq$ 4 of 7 points were considered as having 'good' knowledge, while those that scored < 4 of 7 points were graded as having 'poor' knowledge. Respondents' practice of birth preparedness was scored and graded on an 8-point scale. One point was awarded for compliance, while non-compliance received no points. This gives a minimum score of '0' and a maximum score of '8' points. Those that scored $\geq$ 5 of 8 points were considered as having 'good' practice, while those that scored < 5 of 8 points were graded as having 'poor' practice. Frequency runs were done for further editing and cleansing of the e-data. Frequency distribution tables were constructed; and cross tabulations were done to examine relationship between categorical variables. Chi-square and Fisher's exact tests of independent association were used to test for relationship between categorical variables. All levels of significance were set at $p < 0.05$.

3. RESULTS

3.1 Socio-Demographic Characteristics of Respondents

All the questionnaires administered were completed and analyzed, giving a response rate of 100%. The ages of the 408 respondents ranged from 16 to 43 years (mean = 27.6 $\pm$ 5.1), and a larger proportion (34.1%) were in the 26 – 30 years age group. About a quarter (24.3%) of the respondents were nulliparous, majority of respondents have delivered between 1 and 4 times (64.8%), while only a few were grand-multiparous (11.0%). Almost all the respondents (98.8%) were married. Majority of respondents were Muslims (77.0%), had tertiary education (54.2%) and belong to Hausa/Fulani ethnic groups (68.1%). A larger proportion of respondents were full-time housewives (44.9), and most of them reside in urban areas (86.5%) as shown in Table 1.

3.2 Respondents' Knowledge of Birth Preparedness and Complication Readiness

Majority, 364 (89.2%) of the 408 respondents had good knowledge of birth preparedness and complication readiness (BP/CR). Majority of the respondents knew that unforeseen life threatening conditions related to pregnancy could

occur during pregnancy and childbirth (83.6%), a woman could die due to non-attendance of ANC during which complications could have been detected early enough (80.9%), and that a woman who did not save enough money or have adequate financial support for her needs during pregnancy could develop complications during and after delivery. Other components of the knowledge of BP/CR known to the respondents are as shown in Table 2.

Table 1. Socio-demographic characteristics of respondents

Variables	Frequency (%) n = 408
Age group (in years)	
16-20	35 (8.6)
21-25	120 (29.4)
26-30	139 (34.1)
31-35	86 (21.1)
36-40	27 (6.6)
41-45	1 (0.2)
Parity	
None	99 (24.3)
1-4	264 (64.7)
5 and above	45 (11.0)
Marital status	
Single	2 (0.5)
Married	403 (98.8)
Divorced	2 (0.5)
Widowed	1 (0.2)
Religion	
Christianity	91 (22.3)
Islam	314 (77.0)
Others	3 (0.7)
Education	
No formal education	14 (3.4)
Primary	14 (3.4)
Secondary	159 (39.0)
Tertiary	221 (54.2)
Ethnicity	
Hausa /Fulani	278 (68.1)
Yoruba	44 (10.8)
Igbo	35 (8.6)
Others	51 (12.5)
Occupation	
Full-time housewife	183 (44.9)
Civil servant	101 (24.8)
Business	124 (30.4)
Residence	
Rural	55 (13.5)
Urban	353 (86.5)

There was significant association between good knowledge of BP/CR and place of residence. A significantly higher proportion of the urban residents (91.2%) had good knowledge of BP/CR as compared to the rural residents (76.4%), χ^2 = 10.917, p = 0.001 (Table 3).

3.3 Respondents' Perception of Birth Preparedness and Complication Readiness

Most of the respondents perceived the need for a pregnant woman and her family to observe the various BP/CR practices. Most of them perceived the need to plan ahead of time on choice of place of delivery (95.6%), and also make provision for transportation to place of delivery (96.3%). Majority of respondents also perceived the need for husband / partner to accompany his wife to antenatal clinic visit (70.4%), and also be beside her while giving birth (83.0%). Although, close to half of respondents (49.3%) perceived childbirth as mostly a woman's matter in which the husband / partner has little to contribute, most of them considered it necessary for the family to empower or support pregnant women in good decision-making for safe pregnancy and delivery (96.6%), and in making adequate preparation for transportation during antenatal clinic visits and delivery (73.2%) as shown in Table 4.

3.4 Respondents' Birth Preparedness and Complication Readiness Practices

Most, 375 (92.0%) of the 408 respondents had good practice of birth preparedness and complication readiness (Fig. 1). Although, only about a fifth of respondents 81 (19.9%) booked before 4 months gestation, majority of respondents 305 (74.7%) have made at least 4 antenatal care visits. The hospital was the most preferred place of delivery chosen by most of the respondents 383 (93.9%); and majority of respondents 220 (53.9%) made the choice by themselves (Table 5).

Most of the 408 respondents observed the various BP/CR practices, as most of them have discussed with their husbands or family members on going to the health facility if they develop any danger sign 310 (76.0%), choice of place of delivery 339 (83.1%), making arrangement for transportation for ANC visits and delivery 329 (80.6%), and saving money for emergencies 330 (80.9%). However, only about half of the 408 respondents have discussed with their husbands or family members on making arrangement for blood donors 205 (50.2%), and having a skilled attendant at delivery 226 (55.4%) as shown in Fig. 2.

There was significant association between good practice of birth preparedness and place of residence. A significantly higher proportion of the urban residents (94.1%) had good practice of birth preparedness and complication readiness as compared to the rural residents (78.2%), χ^2 = 16.120, p < 0.001 (Table 6).

Table 2. Respondents' knowledge of birth preparedness and complication readiness

Knowledge of birth preparedness and complication readiness	Correct response Frequency (%) n = 408
Unforeseen life threatening problems related to pregnancy could occur during pregnancy and childbirth	341 (83.6)
A woman could die due to failure to attend ANC during which complications could have been detected early enough	330 (80.9)
A woman who did not save enough money or who did not have adequate financial support for her needs during pregnancy could develop serious complications during pregnancy, delivery or after delivery	333 (81.6)
Pregnant women who had poor personal hygiene during pregnancy could suffer from recurrent vaginal and other pelvic infections before and after delivery	367 (90.0)
Babies born to mothers with poor personal and environment hygiene are more at risk of neonatal infections	349 (85.5)
Pregnant women with inadequate transportation preparedness could develop delivery complications due to late arrival at the health facility for delivery	356 (87.3)
Pregnant women who attend health facilities with unskilled personnel could develop complications during delivery	356 (87.3)
Knowledge grade	**Frequency (%)**
Good	364 (89.2)
Poor	44 (10.8)

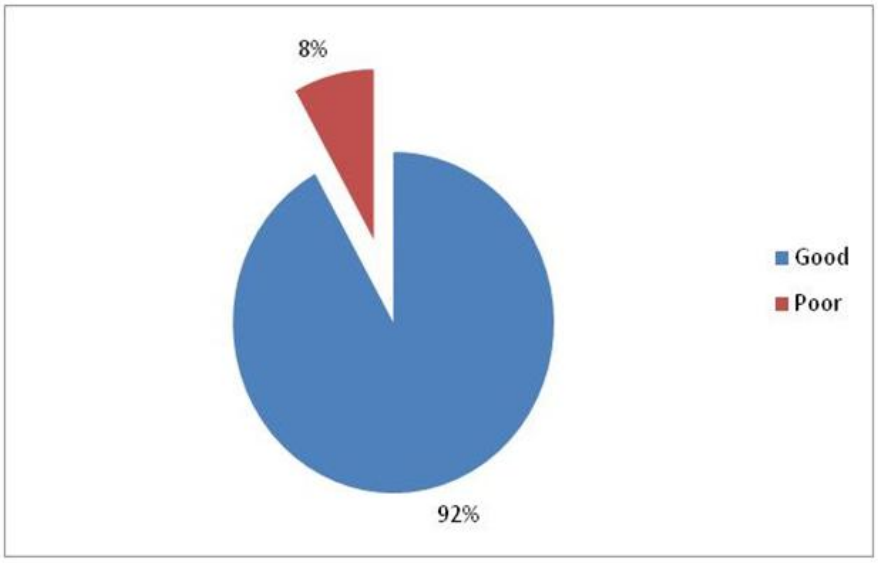

Fig. 1. Grading of respondents' birth preparedness and complication readiness practices

Table 3. Distribution of knowledge of birth preparedness and complication readiness by respondents' socio-demographic variables

Variables	Knowledge of BP/CR (n = 408)		Test of significance
	Good frequency (%)	Poor frequency (%)	
Age group (in years)			
16-20	31 (88.6)	4 (11.4)	$FE\chi^2 = 0.889$, p = 0.971
21-25	107 (89.1)	13 (10.8)	
26-30	125 (89.9)	14 (10.1)	
31-35	75 (87.2)	11 (12.8)	
36-40	25 (92.6)	2 (7.4)	
41-45	1 (100)	0 (0)	
Parity			
None	83 (83.8)	16 (16.2)	$\chi^2 = 6.974$, p = 0.539
1-4	240 (90.9)	24 (9.1)	
5 and above	41 (91.2)	4 (9.8)	
Marital status			
Single	1 (50.0)	1 (50.0)	$FE\chi^2 = 3.567$, p = 0.312
Married	360 (89.3)	43 (10.7)	
Divorced	2 (100)	0 (0)	
Widowed	1 (100)	0 (0)	
Religion			
Christianity	79 (86.8)	12 (13.2)	$\chi^2 = 10.777$, p = 0.065
Islam	284 (90..4)	30 (9.6)	
Others	1 (33.3)	2 (66.7)	
Education			
No formal education	14 (100)	0 (0)	$FE\chi^2 = 8.515$, p = 0.074
Primary	11 (78.6)	3 (21.4)	
Secondary	148 (93.1)	11 (6.9)	
Tertiary	191 (86.4)	30 (13.6)	
Ethnicity			
Hausa /Fulani	254 (91.4)	24 (8.6)	$\chi^2 = 11.220$, p = 0.081
Yoruba	36 (81.8)	8 (18.2)	
Igbo	29 (82.9)	6 (17.1)	
Others	45 (88.2)	6 (11.8)	
Occupation			
Full-time housewife	168 (91.8)	15 (8.2)	$\chi^2 = 5.270$, p = 0.072
Civil servant	84 (83.2)	17 (16.8)	
Business	112 (90.3)	12 (9.7)	
Residence			
Rural	42 (76.4)	13 (23.6)	$\chi^2 = 10.917$, p = 0.001
Urban	322 (91.2)*	31 (8.8)	

4. DISCUSSION

The relatively young age of the respondents in this study with a mean age of 27.6 ± 5.1 years, and with a larger proportion (34.1%) in the 26-30 years age group is in consonance with the finding in a study conducted in Kano, Nigeria [16] that reported a mean age of 26.1 ± 6.4 years. This could be due to the fact that both studies were conducted in Northern Nigeria where early marriage is practiced, unlike in Southern Nigeria where the reverse is true. This is corroborated by the finding in a study conducted in Lagos, Nigeria [11] that reported a relatively older population with a mean age of 30.0 ± 4.1 years.

About a quarter (24.3%) of the respondents in this study were primigravida, this finding agrees with the finding in a study conducted in Ethiopia [17], in which 29.1% of the respondents were primigravida, and it could be due to the relatively young age of the participants in both studies.

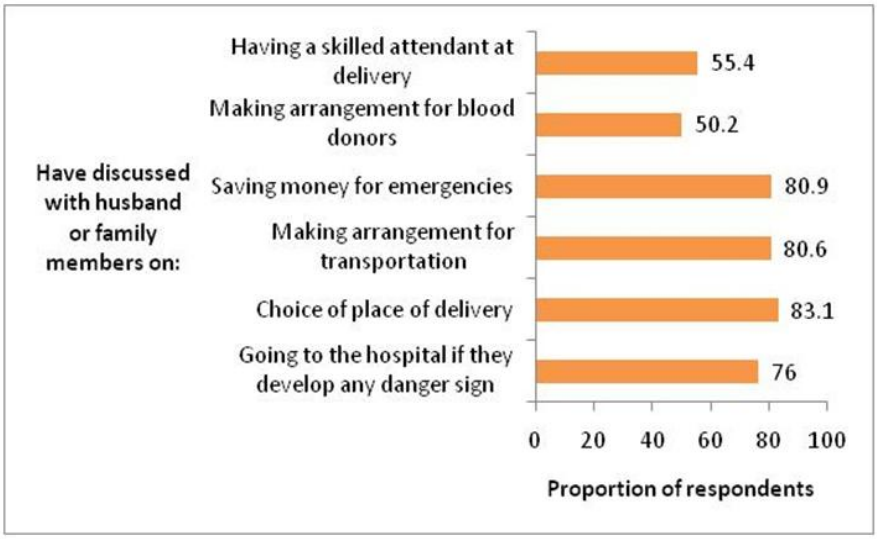

Fig. 2. Respondents' birth preparedness and complication readiness practices

Table 4. Respondents' perception of birth preparedness and complication readiness

Perception of birth preparedness	Response (n = 408)			
	Strongly agree Freq. (%)	Agree Freq. (%)	Disagree Freq. (%)	Strongly disagree Freq. (%)
A woman should plan ahead of time where she will give birth to her baby, whether it is at home, or at the health facility	285 (69.9)	105 (25.7)	7 (1.7)	11 (9.0)
A woman should plan ahead of time how she will get to the place where she will give birth	284 (69.6)	109 (26.7)	5 (1.2)	10 (2.4)
It is necessary for a husband / partner to accompany his wife to antenatal clinic visit	137 (33.6)	150 (36.8)	107 (26.2)	14 (3.5)
It is necessary for a husband / partner to be beside his wife when she is giving birth	194 (47.5)	145 (35.5)	55 (13.5)	14 (3.4)
Giving birth is mostly a woman's matter, husband / partner has little to contribute	69 (16.9)	132 (32.4)	122 (29.9)	85 (20.8)
It is necessary to empower or support pregnant women in good decision making for safer pregnancy and delivery	279 (68.4)	115 (28.2)	6 (1.5)	8 (1.9)
It is necessary for the families of a pregnant woman to adequately provide means of transportation during antenatal clinic visit and delivery	207 (50.7)	104 (22.5)	84 (20.6)	13 (3.2)

On the contrary, close to half (46.8%) of the respondents in the study conducted in Kano [16], which had a substantial proportion of older participants were multigravidas. Despite the documented low female enrollment into basic formal education in Sokoto [18], most of the respondents in this study (93.2%) had at least secondary education. This could be related to the fact that a substantial proportion of the respondents belong to other ethnic groups from the southern part of the country with documented high female enrollment into schools [19], and the fact that majority of the respondents in this study were urban residents who are more likely to have access to education. While this finding agrees with the finding in the study conducted in Lagos, Nigeria [11], in which about two-thirds (64.1%) of the study participants had tertiary education, it differs from the finding in a study conducted in Koupela district of Burkina Faso [20], in which

most of the respondents (87.2%) had no formal education. The poor educational attainment in the Burkina Faso study could be due to the fact that the study was conducted in a rural community where access to education is often poor. Most of the respondents in this study (98.8%) were married, this could be because majority of the respondents (68.1%) were Hausa / Fulanis, and practiced Islam as religion (77.0%); and Islam prohibits girls having children out of wedlock.

Table 5. Antenatal care clinic visits and choice of place of delivery

Variables	Frequency (%) n = 408
Gestational age of pregnancy at booking	
Less than 4 months	81 (19.9)
4 months and above	327 (80.1)
Number of antenatal care clinic visits made in this pregnancy	
Less than 4 visits	103 (25.2)
4 visits and above	305 (74.8)
Choice of place of delivery	
Hospital	383 (93.9)
Home	21 (5.1)
Faith home	4 (1.0)
Decision on choice of place of delivery made by:	
Self	220 (53.9)
Husband	176 (43.1)
Mother in-law	4 (0.9)
Healthcare personnel	8 (2.0)

This study showed that majority of the respondents (89.2%) had good knowledge of birth preparedness and complication readiness. While this finding is in concordance with the finding in a study conducted in Ghana [21], that reported that 74.3% of the respondents had knowledge of birth preparedness, it differs from the finding in another study conducted in Ethiopia [17], in which majority of the participants (53.6%) reported that they have never heard of birth preparedness. The variations in these studies could be due to differences in the study settings (rural versus urban) and educational level of the study participants. The association between good knowledge of birth preparedness and being an urban resident in this study could be due to the possibility of more access to information on birth preparedness in the urban communities as compared to the rural communities, particularly through other sources including the mass media. These findings highlight the importance of socioeconomic development of the rural areas (particularly access to information and healthcare services) as a viable tool for improving both the quality of care, and compliance with evidence based effective and efficient interventions on maternal health. Intriguingly, there was no association between level of education and good knowledge of birth preparedness in this study. This finding is in contrast to the finding in a study in South-eastern Nigeria [22], in which education level was found to be a predictor of knowledge of the concept of birth preparedness.

Most of the participants in this study perceived the need for birth preparedness and complication readiness, the benefits of observing BP/CR practices, and the consequences of non-compliance. Similar to the findings in this study, a study conducted in a rural district of Ghana [23], reported high level of perception of need for BP/CR including perception of the need for transport arrangement, need to identify blood donors, and need for financial preparations during pregnancy.

Most of the respondents in this study (92.0%) showed good practice of birth preparedness and complication readiness. Although, only about a fifth (19.9%) of the respondents booked before 4 months gestation, a majority of respondents (74.7%) had made at least 4 antenatal care visits. This is re-assuring as it means that they would have had sufficient contacts with the healthcare professionals to be educated on birth preparedness and complication readiness practices; and this is supported by the compliance with the various BP/CR practices by most of the respondents. Majority of the respondents had discussed with their husband or family members on key BP/CR practices including choice of place of delivery (83.1%), arrangement for transportation for ANC clinic visits and delivery (80.6%), and saving money for emergencies (80.9%). The fewer proportion of participants that had discussed with their husband or family members on making arrangement for blood donor (50.2%), or need for skilled attendants at delivery (55.4%) does not necessary mean that they considered these practices to be less important than the other ones considering the high proportion of participants that chose hospital delivery (93.9%). The respondents probably believed that hospital delivery automatically guarantees availability of skilled attendant at delivery and comprehensive emergency obstetric services (including blood transfusion).

Table 6. Distribution of practice of birth preparedness and complication readiness by respondents' socio- demographic variables

Variables	Practice of BP/CR (n = 408)		Test of significance
	Good frequency (%)	Poor frequency (%)	
Age group (in years)			
16-20	33 (94.3)	2 (5.7)	FEχ^2 = 6.009, p = 0.305
21-25	112 (93.3)	8 (6.7)	
26-30	131 (94.2)	8 (5.8)	
31-35	74 (86.0)	12 (14.0)	
36-40	24 (88.9)	3 (11.1)	
41-45	1 (100)	0 (0)	
Parity			
None	87 (87.9)	12 (12.1)	χ^2 = 5.388, p = 0.715
1-4	246 (93.2)	18 (6.8)	
5 and above	42 (93.3)	3 (6.7)	
Marital status			
Single	2 (100)	0 (0)	FEχ^2 = 0.445, p = 0.931
Married	370 (91.8)	33 (8.2)	
Divorced	2 (100)	0 (0)	
Widowed	1 (100)	0 (0)	
Religion			
Christianity	83 (91.2)	8 (8.8)	χ^2 = 0.331, p = 0.847
Islam	289 (92.0)	25 (8.0)	
Others	3 (100)	0 (0)	
Education			
No formal education	14 (100)	0 (0)	FEχ^2 = 8.515, p = 0.074
Primary	14 (100)	0 (0)	
Secondary	150 (94.3)	9 (5.7)	
Tertiary	197 (89.1)	24 (10.9)	
Ethnicity			
Hausa /Fulani	262 (94.2)	16 (5.8)	χ^2 = 11.303, p = 0.023
Yoruba	41 (93.2)	3 (6.8)	
Igbo	28 (80.0)	7 (20.0)	
Others	44 (86.3)	7 (13.7)	
Occupation			
Full-time housewife	173 (94.5)	10 (5.5)	χ^2 = 8.356, p = 0.015
Civil servant	86 (85.1)	15 (14.9)	
Business	116 (93.5)	8 (6.5)	
Residence			
Rural	43 (78.2)	12 (21.8)	χ^2 = 16.120, p < 0.001
Urban	332 (94.1)*	21 (5.9)	

The good practice of BP/CR demonstrated by most of the respondents (92.0%) in this study differs from the finding in a study in Kano, Nigeria [16], which reported that only about 60.4% of the clients were prepared. It is also far ahead of the finding in another study in Adigrat town, Ethiopia [9], which reported that only about a fifth of respondents (22.1%) were prepared for birth in a comprehensive way; this may be because the Ethiopian study was conducted in a rural community with poor access to information on BP/CR. The significantly lower knowledge and practice of BP/CR among the rural residents as compared to the urban residents in this study essentially mirrors the situation in many countries in sub-Saharan Africa; and it not only highlights the prevalent disparity in access to information and healthcare services between the rural and urban populations across the continent [24], but it also explains the wide disparity in maternal mortality ratios in the rural and urban populations of Nigeria and other sub-Saharan Africa countries [20,25]. These findings re-affirm the need for governments of sub-Saharan African countries to make concerted efforts in addressing the inequalities in access to information and

healthcare services in the rural and urban populations of their respective countries.

5. CONCLUSION

This study showed good knowledge, perception of need, and good practice of birth preparedness and complication readiness among the respondents, but significant disparities exist between the rural and urban residents. Governments should make concerted efforts to bridge the gap in the knowledge and practice of BP/CR between the rural and urban residents by addressing the prevalent inequalities in access to information and healthcare services between the rural and urban populations of their countries.

CONSENT

As per international standard or university standard, patient's written consent has been collected and preserved by the authors.

ETHICAL APPROVAL

As per international standard or university standard, written approval of Ethics committee has been collected and preserved by the authors.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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