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## ORIGINAL RESEARCH

### Determinants of the Utilization of Skilled Birth Attendance among Women in Ogun East Senatorial District, Nigeria: A Rural-Urban Comparison

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#### Abstract

**Background:** Every woman needs access to skilled care during pregnancy, childbirth, and the following weeks. Recent estimates show that the proportion of deliveries attended by a skilled attendant in many African countries remains low.

**Objective:** To identify the determinants of utilising skilled birth attendance (SBA) among women in Ogun East Senatorial District of Nigeria.

**Methods:** A comparative, cross-sectional study was conducted among 375 women in each rural and urban community selected using multistage sampling. A pretested interviewer-administered, structured questionnaire was used for data collection.

**Results:** A higher proportion of urban respondents (67.7%) utilised SBA compared to rural respondents (53.6%),  $p < 0.001$ . The determinants of utilisation of SBA services included proximity and means of transportation to the facility ( $p < 0.001$ ). On multivariate analysis, health problems in the preceding pregnancy (AOR = 8.183, 95% CI = 2.621-25.545) and spousal support (AOR = 6.909, 95% CI = 2.013-23.705) remained significant determinants of utilisation of SBA in the rural area but not in the urban area.

**Conclusion:** Rural dwellers face significant barriers in accessing the services of skilled birth attendance. Improving transportation infrastructure, engaging spouses in maternal health education and managing health problems during pregnancy could enhance SBA utilisation and reduce rural-urban disparities.

**Keywords:** *Childbirth, Healthcare Providers, Utilisation, Skilled Birth Attendants, Women, Rural-Urban Comparison.*

#### Introduction

Every woman needs access to skilled care during pregnancy, childbirth, and in the weeks

following childbirth. Using Skilled Birth Attendants (SBAs) services during delivery can make the difference between the life and death of mother and child, thereby accelerating the achievement of the global goal of maternal

mortality rate of 70 per 100,000 live births by 2030. [1] The World Health Organization has defined a skilled birth attendant as an accredited health professional, such as a midwife, nurse, or doctor, who has been trained to be proficient in the skills needed to manage normal (uncomplicated) pregnancies, childbirth, and immediate postnatal period; and in the identification, management, and referral of complications in women and newborn.[2]

Globally, about 830 women die every day from complications of pregnancy and childbirth, [3] the vast majority of these deaths occur in low-resource settings.[4] The high number of maternal deaths in parts of the world shows the inequities in access to essential health services,[5] and reveals the gap existing between the rich and poor.[3] These maternal deaths, which occur in developing countries, especially in sub-Saharan Africa where more than half of the burden lies, are largely preventable.[3]

Delivery by SBAs has an impact on child survival,[6] and is key to the reduction of maternal mortality.[7] Studies have revealed that a skilled birth attendant who has been properly trained, could reduce mortality that occurs during labour, delivery, and shortly after birth by providing clean delivery practices, labour surveillance, and neonatal resuscitation to address intrapartum-related birth asphyxia and treatment of infections.[8] Timely management and treatment of illnesses in a pregnant woman by a proficient healthcare provider can be the determining factor in ensuring the survival of both the mother and the baby.[1] Unfortunately, poor women in remote areas are less likely to receive adequate health care. Women who reside in rural areas were less likely to be assisted by skilled birth attendants compared to women in urban areas; this could be attributed to a lack of access to health facilities in terms of distance and finance.[9]

A variation in SBA coverage exists globally, both within and between continents; it is much lower (52%) in southern Asia and (34.8%) in sub-Saharan Africa.[10,11] This disparity is further reflected in Nigeria, where studies have noted significant rural-urban inequities in the use of skilled delivery services, indicating that women in rural areas are less likely to access skilled birth attendants than their urban counterparts.[12] Nigeria's existing rural health facilities are often bereft of adequate equipment and competent health personnel. They are largely inaccessible due to the distance to the community and poor road networks.[12,13] A study on the factors associated with assistance during delivery in rural Nigeria revealed that 23% of rural women utilised skilled assistance during most recent deliveries compared with 77% who utilised unskilled assistance. [13] A similar study in an urban community in Kwara State, Nigeria showed that skilled birth attendants supervised 73.8% of births.[14] A systematic review of inequalities in the use of skilled maternal care in developing countries conducted by the World Health Organization also revealed that urban women were usually more likely to deliver with the help of a skilled health worker than rural women.[15] The difference in skilled assisted deliveries in rural and urban areas raises the question of whether different policies and interventions are required.[16]

Furthermore, regions of the world with the lowest level of skilled care in pregnancy and delivery have the highest maternal morbidity and mortality. [3] Recent estimates showed that the proportion of deliveries attended by a skilled attendant in many African countries remained below 50%.[4] In Nigeria, less than half (43%) of deliveries are assisted by a skilled health provider (32% by nurses/ midwives and 9% by doctors). Unskilled providers, such as traditional birth attendants, assist in 20% of deliveries, while 11% of births receive no assistance.[7] Available data in Ogun State, Nigeria, 34.1% of deliveries

were assisted by doctors, 38.4% were assisted by nurses/midwives, 4.4% were assisted by auxiliary nurses, 7.4% were assisted by CHEWs, and the remaining 15.7% were assisted by unskilled providers.<sup>[7]</sup> To formulate strategies that will promote SBA utilisation, there is an urgent need for information on barriers and enablers of SBA utilisation. Unlike many previous studies, which are predominantly facility-based,<sup>[17-21]</sup> the present study was community-based. The objective of the present study was to identify the determinants of the utilisation of skilled birth attendants among women in Ogun East Senatorial District, Nigeria.

### Methods

#### Study area

This study was conducted in Ogun East Senatorial District, Southwestern Nigeria. It is one of the three senatorial districts in Ogun state, consisting of nine local government areas (six rural-Ijebu East, Ijebu North, Ijebu Northeast, Odogbolu, Ogun Waterside and Remo North; and three urban-Ijebu Ode, Ikenne and Sagamu).<sup>[7,22]</sup> Ogun East Senatorial District has a population of 1.25 million (Census 2006) and a projected population of about 1.74 million by 2016<sup>[23]</sup> and 1.96 million by 2020.<sup>[24]</sup> The people of Ogun East Senatorial District belong to the Yoruba ethnic group of Nigeria. In the urban areas of the district, the major occupations include “white-collar” jobs and petty trading. At the same time, farming is predominant in the rural areas of the senatorial district.<sup>[25]</sup>

#### Study design

This was a comparative cross-sectional study.

#### Study population

The study was carried out among women of childbearing age (15-49 years) living in both rural and urban areas of the Ogun East Senatorial District.

#### Inclusion and exclusion criteria

The study included women who had lived in the selected areas for at least 36 months and had at least one birth within the last 36 months, regardless of birth outcome. It excluded women who were severely ill and unable to participate in the survey.

#### Sample size determination

The sample size was determined using the statistical formula for comparative study:

$$n = (Z\alpha/2 + Z\beta)^2 (p_1q_1 + p_2q_2) / (p_1 - p_2)^2$$

where:

$n$  is the minimum sample size for each group.

$Z\alpha$  is the standard normal deviate at 95% confidence level (1.96).

From a previous study, the proportion who utilised skilled care during delivery (48.6% in urban and 41.7% in rural).<sup>16</sup>

$Z\beta$  is the standard normal deviate with the power of demonstrating a statistically significant difference between the two groups at 90% ( $0.84$ )  $p_1 = 48.6\%$  ( $0.486$ ) is the proportion of urban dwellers who used skilled birth attendants.

$p_2 = 41.7\%$  ( $0.417$ ) is the proportion of rural dwellers who used skilled birth attendants.

$q_1 = 0.514$  ( $= 1 - 0.486$ ) is the proportion of urban dwellers who did not use skilled birth attendants.

$q_2 = 0.583$  ( $= 1 - 0.417$ ) proportion of rural dwellers who did not use skilled birth attendants.

$$p_1 - p_2 = 0.486 - 0.417 = 0.069.$$

The calculated sample size was 337.5. Accounting for a 10% rate of non-responses and invalid responses, the final sample size was 375.

This yielded a minimum sample size of 375. A sample size of 375 women each was studied in the selected rural and urban areas, making a total of 750 women.

#### Sampling technique

Multistage sampling was used to select study participants. Stage one was the selection of one urban (Sagamu Local Government Area) and one rural local government (Odogbolu Local Government Area). Stage two involved the selection of the wards from each Local

Government Area using simple random sampling by balloting. In stage three, house numbering was conducted in Batoro and Okun-owa wards. Systematic random sampling was used to select houses. The total number of houses in each of the selected wards was divided by the sample size; this gave a sampling interval of 5. The first house was selected by simple random sampling. Subsequently, every 5th house was selected. All households were identified in the selected houses; where there was more than one eligible household in the house, one was selected using simple random sampling by balloting. In the final stage, the eligible woman in each selected household was identified and interviewed. Where there was more than one eligible woman, simple random sampling was used to select one of the eligible women for the interview. Houses in which there was no eligible woman were skipped.

#### *Data collection*

Data was collected using an interviewer-administered, structured questionnaire adapted from the Safe Motherhood Questionnaire of the Maternal and Neonatal Health Program of the Johns Hopkins Program for International Education in Gynecology and Obstetrics (JHPIEGO) and the Nigeria Demographic Health Survey 2018. [7,27] Trained research assistants aided data collection. A pretested questionnaire was administered to 38 women (10% of the minimum sample size) who have had at least a birth in the last 36 months in Abeokuta South Local Government Area in Ogun Central Senatorial District. Modifications were subsequently made based on observations from the pretest.

#### *Data analysis*

The data was analysed using the IBM SPSS for Windows version 22.0 software program. Skilled birth attendance was analysed as a binary variable with two categories: "utilised SBA" or "did not utilise SBA." Deliveries supervised by a

doctor, nurse, or midwife were categorised as "utilised SBA." In contrast, deliveries taken by self, TBAs, relatives, friends, or any other person based on respondents' description were classified as unskilled and hence "did not utilise SBA". Descriptive statistics were used to generate frequencies and proportions. Student's t-test and the Chi-square test were used to test for associations between independent and dependent variables at a 95% confidence interval. The independent variables that had a statistically significant association with the dependent variable at a p-value less than 0.05 were included in a logistic regression model to determine factors independently associated with the utilisation of skilled birth attendance.

#### *Ethical considerations*

Ethical clearance was obtained from Babcock University Health Research Ethics Committee (BUHREC/309/20b), and the Ministry of Health, Ogun State (HPRS/381/339), Nigeria. Approval was obtained from the Medical Officers of Health in Sagamu and Odogbolu Local Government Areas. Written informed consent was obtained from respondents and confidentiality was ensured.

## **Results**

Table I shows the socio-demographic characteristics of the respondents. In both rural and urban areas, most respondents were in the age group 25-29 years. The difference in the mean age of rural and urban residents was not statistically significant ( $t = -0.840$ ,  $p = 0.401$ ). In the rural area, 57 (15.2%) respondents had no formal education, compared to 17 (4.5%) in the urban area. Among the rural respondents, 25 (6.7%) had tertiary education as the highest educational status, while 31 (8.3%) respondents in the urban area had tertiary education as the highest level of education. The association between educational status and place of

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residence was statistically significant ( $\chi^2 = 45.514$ ,  $p < 0.001$ ).

**Table I: Socio-demographic characteristics of respondents (N=375 per group)**

Variable	Rural n (%)	Urban n (%)	Statistics
<b>Age Group (Years)</b>			
<24	60 (16.0)	45 (12.3)	
25-29	113 (30.1)	125 (33.3)	$\chi^2 = 5.189$
30-34	95 (25.3)	98 (26.1)	$p = 0.393$
35-39	76 (20.3)	64 (17.1)	
40-44	22 (5.9)	30 (8.0)	
$\geq 45$	9 (2.4)	12 (3.2)	
Mean	30.69 $\pm$ 6.312	31.07 $\pm$ 6.115	$t = -0.840$ , $p = 0.401$
<b>Occupation</b>			
Unemployed	39 (10.4)	24 (6.4)	
Agricultural worker	9 (2.4)	3 (0.8)	
Civil servant	10 (2.7)	1 (0.3)	
Trader	151 (40.3)	173 (46.1)	
Unskilled	159 (42.4)	163 (43.5)	$\chi^2 = 16.367$
Semi-skilled	7 (1.9)	11 (2.9)	$p = 0.006$
<b>Marital status</b>			
Single	18 (4.8)	7 (1.9)	
Married	347 (92.5)	350 (93.3)	
Divorced	2 (0.5)	3 (0.8)	
Separated	6 (1.6)	11 (2.9)	$\chi^2 = 7.190$
Widowed	2 (0.5)	4 (1.1)	$p = 0.126$
<b>Religion</b>			
Christianity	330 (88.0)	313 (83.5)	
Islam	45 (12.0)	57 (15.2)	$\chi^2 = 6.861$
Traditional worshipper	0 (0.0)	5 (1.3)	$p = 0.032$
<b>Ethnicity</b>			
Yoruba	329 (87.7)	365 (97.3)	
Igbo	9 (2.4)	2 (0.5)	
Hausa	24 (6.4)	8 (2.1)	$\chi^2 = 27.322$
Others	13 (3.5)	0 (0.0)	$p < 0.001$
<b>Highest Educational status</b>			
No formal education	57 (15.2)	17 (4.5)	
Primary	80 (21.3)	41 (10.9)	
Secondary	213 (56.8)	286 (76.3)	$\chi^2 = 45.514$
Tertiary	25 (6.7)	31 (8.3)	$p < 0.001$
<b>Parity</b>			
<3	190 (50.7)	204 (54.4)	$\chi^2 = 1.048$
$\geq 3$	185 (49.3)	171 (45.6)	$p = 0.306$

In Table II, the proportion of urban respondents who utilised skilled birth attendance was 67.7%, higher than 53.6% of rural respondents who utilised skilled birth attendance. The difference in the utilisation of skilled birth attendance among rural and urban respondents was statistically significant ( $p < 0.001$ ).

Table III shows that the statistically significant determinants of utilisation of skilled birth attendance included proximity and availability of a means of transportation to the facility ( $p < 0.001$ ).



**Table II: Utilisation of skilled birth attendance among respondents (N=375)**

Variable	Rural n (%)	Urban n (%)	Statistics
Utilised SBA	201 (53.6)	254 (67.7)	$\chi^2 = 15.696$
Not Utilised SBA	174 (46.4)	121 (32.3)	$p < 0.001$

**Table III: Determinants of utilisation of skilled birth attendance among rural and urban respondents**

Variable	Rural n (%)	Urban n (%)	$\chi^2$	p-value
Utilisation of SBA				
Availability of bed and delivery equipment	351 (93.6)	362 (96.5)	3.440	0.064
Availability of drugs	355 (94.7)	364 (97.1)	2.726	0.099
Proximity (Distance to the facility)	125 (33.3)	190 (50.7)	23.125	<0.001
Available means of transportation to the facility	318 (84.8)	363 (96.8)	32.321	<0.001
Attitude of health workers (good)	368 (98.1)	374 (99.7)	4.549	0.033

In Table IV, the statistical relationship between age and utilisation of SBA was significant in the rural area ( $p = 0.002$ ) but not in the urban area ( $p = 0.969$ ). Marital status showed a statistically significant relationship with the utilisation of SBA in the rural area ( $p = 0.006$ ) but not in the urban area ( $p = 0.908$ ). The relationship between parity and utilisation of SBA was statistically significant in the rural area ( $p = 0.004$ ) but not in the urban area ( $p = 0.481$ ). The presence of health problems in the previous pregnancy preceding the last was statistically significantly associated with the utilisation of SBA in rural and urban areas ( $p < 0.001$ ). The relationship between the cost of health services and utilisation of SBA was not statistically significant in both rural and urban areas ( $p = 0.534$  and  $p = 0.494$ , respectively). The relationship between proximity of the health facility to the community and utilisation of SBA was statistically significant in the urban area.

Table V shows that with multivariate health problems in the previous pregnancy preceding the last (AOR=8.183, 95% CI=2.621-25.545) and

having spousal support (AOR=6.909, 95% CI=2.013-23.705) remained significant predictors of utilisation of SBA in the rural area, this was not the case in the urban area.

## Discussion

Most participants had received some type of formal education, with urban respondents having a higher proportion of formal education than those from rural areas. This is consistent with results from similar studies conducted in Cross River, [28] Edo, [29] and Lagos [12] States, all in Nigeria. Additionally, it has been noted that there are more educational institutions in urban areas than in rural areas, so it is expected that urban dwellers would have a higher level of education. [30] The proportion of respondents who utilised skilled birth attendance was higher among urban than rural respondents. This finding agrees with a previous study in Lagos, Nigeria [12] and a report of the World Health Organization. [15]

**Table IV: Bivariate analysis of the determinants of utilisation of SBA**

<i>Variable</i>	<i>Rural n (%)</i>		<i>Urban n (%)</i>	
	<i>Utilised SBA</i>	<i>Did not utilise SBA</i>	<i>Utilised SBA</i>	<i>Did not Utilise SBA</i>
<b>Age (years)</b>				
≥30	124 (61.1)	79 (38.9)	138 (67.6)	66 (32.4)
<30	77 (44.8)	95 (55.2)	116 (67.8)	55 (32.2)
Statistics (X <sup>2</sup> ; p)	(9.967; 0.002)		(0.002; 0.969)	
<b>Marital status</b>				
Currently married	193 (55.6)	154 (44.4)	238 (67.8)	113 (32.2)
Not currently married	8 (28.6)	20 (71.4)	16 (66.7)	8 (33.3)
Statistics (X <sup>2</sup> ; p)	(7.622; 0.006)		(0.013; 0.908)	
<b>Occupation</b>				
Employed	187 (55.7)	149 (44.3)	242 (68.9)	109 (31.1)
Unemployed	14 (35.9)	25 (64.1)	12 (50.0)	12 (50.0)
Statistics (X <sup>2</sup> ; p)	(5.485; 0.019)		(3.689; 0.055)	
<b>Educational status</b>				
Formal education	174 (54.7)	144 (45.3)	246 (68.7)	112 (31.3)
No formal education	27 (47.4)	30 (52.6)	8 (47.1)	9 (52.9)
Statistics (X <sup>2</sup> ; p)	(1.050; 0.306)		(3.483; 0.062)	
<b>Religion</b>				
Christian	184 (55.8)	146 (44.2)	211 (67.6)	101 (32.4)
Non-Christian	17 (37.8)	28 (62.2)	43 (68.3)	20 (31.7)
Statistics (X <sup>2</sup> ; p)	(5.147; 0.023)		(0.009; 0.923)	
<b>Ethnicity</b>				
Yoruba	184 (55.9)	145 (44.1)	249 (68.0)	117 (32.0)
Non-Yoruba	17 (37.0)	29 (63.0)	5 (55.6)	4 (44.4)
Statistics (X <sup>2</sup> ; p)	(5.840; 0.016)		(0.626; 0.429)	
<b>Parity</b>				
≤3	88 (46.3)	102 (53.7)	135 (66.2)	69 (33.8)
≥4	113 (61.1)	72 (38.9)	119 (69.6)	52 (30.4)
Statistics (X <sup>2</sup> ; p)	(8.217; 0.004)		(0.496; 0.481)	
<b>Spousal support</b>				
Yes	197 (56.9)	149 (43.1)	240 (68.2)	112 (31.8)
No	4 (13.8)	25 (86.2)	14 (60.9)	9 (39.1)
Statistics (X <sup>2</sup> ; p)	(20.026; <0.001)		(0.528; 0.467)	
<b>Problem in a previous pregnancy</b>				
Yes	53 (93.0)	4 (7.0)	82 (82.2)	17 (17.2)
No	148 (46.5)	170 (53.5)	172 (62.3)	104 (37.7)
Statistics (X <sup>2</sup> ; p)	(41.918; <0.001)		(14.024; <0.001)	
<b>Cost</b>				
Yes	170 (54.3)	143 (45.7)	232 (67.2)	113 (32.8)
No	31 (50.0)	31 (28.8)	22 (73.3)	8 (26.7)
Statistics (X <sup>2</sup> ; p)	(0.387; 0.534)		(0.468; 0.494)	
<b>Proximity</b>				
Yes	69 (55.2)	56 (44.8)	141 (74.2)	49 (25.8)
No	132 (52.8)	118 (47.2)	113 (61.1)	72 (38.9)
Statistics (X <sup>2</sup> ; p)	(0.193; 0.660)		(7.393; 0.007)	



Table V: Multivariate analysis of the determinants of utilisation of SBA

Variable	Rural			Urban		
	AOR	95% CI	p-value	AOR	95% CI	p-value
<b>Age (years)</b>						
≥30	Ref			Ref		
<30	1.435	0.807-2.552	0.219	0.675	0.366-1.247	0.210
<b>Marital status</b>						
Currently married	Ref			Ref		
Not currently married	1.189	0.345-4.099	0.784	1.882	0.651-5.441	0.243
<b>Occupation</b>						
Employed	0.882	0.330-2.361	0.803	Ref		
Unemployed	Ref			2.331	0.843-6.447	0.103
<b>Religion</b>						
Christian	Ref			1.649	0.814-3.341	0.165
Non-Christian	1.608	0.647-3.996	0.306	Ref		
<b>Ethnicity</b>						
Yoruba	Ref			0.542	0.098-3.008	0.484
Non-Yoruba	1.706	0.741-3.923	0.209	Ref		
<b>Parity</b>						
≤3	1.317	0.726-2.389	0.364	1.030	0.560-1.892	0.925
≥4	Ref			Ref		
<b>Problem in a previous pregnancy</b>						
Yes	Ref			Ref		
No	8.183	2.621-25.545	<0.001*	2.277	1.156-4.484	0.017
<b>Proximity</b>						
Yes	Ref			Ref		
No	1.41	0.668-1.947	0.629	1.562	0.941-2.591	0.085
<b>Spousal support</b>						
Yes	6.909	2.013-23.705	0.002*	0.843	0.274-0.594	0.766
No	Ref			Ref		

The disparity observed in this study could have been due to a higher socioeconomic status and educational level among urban respondents compared to the rural respondents, which could have contributed to the ability of urban respondents to afford the services of a skilled birth attendant.

The determinants of utilisation of skilled birth attendance in the present study included proximity and availability of the means of

transportation to the facility. This was in contrast to a study in Ghana [31] where the level of education and satisfaction with healthcare services were the determinants of utilisation of skilled birth attendance. The current study's finding is unsurprising, as women in both rural and urban areas are more likely to prefer receiving health care at a centre close to where they live. Upon bivariate analysis, this study showed that the socio-demographic factors influencing SBA utilisation in rural areas

included age, marital status, occupation, religion, and ethnicity. Other factors were parity, spousal support, and health problems in the previous pregnancy preceding the last. In the urban area, factors that similarly influenced the utilisation of SBA were health problems in the previous pregnancy preceding the last and proximity to the health facility. These findings aligned with findings in previous studies carried out in Northern Nigeria, [6] Northern Ghana, [31] and Southern Nigeria.[32]

Lastly, health problems in the pregnancy preceding the last and spousal support remained significant determinants of utilisation of SBA in the rural area, while this was not the case in the urban area. This finding could have been due to the fact that rural women will most likely depend on their husbands for decision-making, more so living in a patriarchal society. [33] This finding may also be related to the level of education of these women, and the highest level of education was found among urban women than rural women.

### Limitations

Recall bias was a limitation of this study since it involved remembering a past event. However, this was considered minimal since giving birth is a personal experience that may not be easily forgotten and the most recent pregnancy experience was measured.

### Conclusion

Health problems in the pregnancy preceding the last and spousal support were significant determinants of the utilisation of SBA in rural areas in the present study. At the same time, this was not the case in the urban area. Health programs should focus on managing health problems during pregnancy, as these significantly influence SBA use. Efforts to engage spouses in maternal health education could enhance SBA utilisation. The study also revealed

disparities between rural and urban areas in the utilisation of skilled birth assistance, advocating for bridging this gap to ensure the global target of reducing maternal mortality to 70 per 100,000 live births by 2030 is met.

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**Authors' Contributions:** ANO conceived and designed the study and reviewed the literature. ANO and SKJ did data analysis and interpretation. ANO drafted the manuscript. OAO, OAY, BAF and SKJ revised the draft of the manuscript. All the authors approved the final version of the manuscript.

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