



## Utilization of Delivery Services among Mothers in Aluu Community, Ikwerre Local Government Area, Rivers State.

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### Abstract

**Background:** Utilization of delivery services is paramount to achieving a safe delivery outcome and preventing maternal mortality/morbidity among mothers. In semi-urban communities, delivery services are provided by both health and non-health facilities and are influenced by either socio-demographic or economic factors. This study aims to evaluate the utilization of delivery services across various places that provide such care and to identify the factors that influence the utilization of delivery services in the Aluu community.

**Methodology:** A community-based cross-sectional study was conducted in 5 out of 9 villages in the Aluu community. A total of 415 respondents were recruited for the study. The study was carried out between April 2021 and October 2021. A multistage sampling method was used, and data was collected using an interviewer-administered structured questionnaire. The data was analyzed using SPSS version 25. The Chi-square test was used for inferential analysis and a significant level was set at  $p \leq 0.05$  at 95% confidence interval.

**Results:** Out of 415 respondents, 44.03% were delivered in a healthcare facility while 55.97% were delivered in a non-health care facility. Tribe, religion, educational status, occupation, and Obstetrics and gynecological factors were found to influence the utilization of delivery services.

**Conclusion:** More than half of women utilized delivery services provided by non-health facilities and there was a significant relationship between tribe, religion, educational status, occupation, and Obstetrics and gynecological factors and the utilization of delivery services in the Aluu community.

**Keywords:** Utilization, Delivery Services, Aluu Community.

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## Introduction

Delivery services involve care that is provided to a woman during the phases of childbirth. It starts from antenatal services and ends after the delivery of a fetus.<sup>[1]</sup> It is paramount to achieve a safe delivery outcome by preventing maternal mortality/morbidity among mothers.<sup>[2]</sup> In Europe, Central and East Asia, the Pacific, Latin America, and the Caribbean, 90% of childbirths occur in a healthcare facility while in Sub-Saharan Africa, 56% of all births occur in a healthcare facility.<sup>[3]</sup> Previous Studies that were conducted showed that in Nigeria, 36% of deliveries took place in a healthcare facility. Factors such as education, age, residency, work position, household financial status, parity, distance to the facility, cultural factors, and the attitude of facility employees influence the utilization of delivery services in a health institution.<sup>[3]</sup> In some semi-urban communities within Sub-Saharan Africa, delivery services are provided by various places: both health and non-health facilities are massively influenced by socio-demographic/economic factors that determine their use.<sup>[4]</sup> Patronage of faith-based centers and Traditional Birth Attendants (TBA) and other related places have been discovered to be on the high increase, especially in semi-urban and rural communities and this has resulted in avoidable morbidities and mortalities from pre-eclampsia, ruptured uterus, placenta previa, gestational diabetes.<sup>[5]</sup>

It has become pertinent to carry out this study to evaluate the utilization of delivery services across various places that provide such care in the Aluu community and to identify the factors that influence the utilization of delivery services in that community. Moreover, it will enable health system managers, stakeholders, policymakers, and government to create policies that will address the various challenges facing the communities and encourage maximum utilization of healthcare centers for delivery in the community.

## Methodology

This is a community-based cross-sectional study carried out from April 2021 to October 2021 in the Aluu community that has 9 villages (Omuike, Omuoda, Omochiorlu, Omuoko, Mbodo, Omahunwo, Omokiri, Omuihuechi and Omuigwe).<sup>[6]</sup> The estimated total population of women of childbearing age in the Aluu community was 26,462. Out of the 9 villages, 5 villages were chosen for this study. Four hundred and fifteen mothers who have been residents of the Aluu community for at least 2 years and had their last child in the last three years were selected to participate in this study. The sample size was calculated using the Cochrane formula with p value of 0.57 for women who used maternal health services.<sup>[7]</sup> The standard normal deviation was set at 1.96 corresponding to a 95% confidence interval and a 10% non-response rate. The sample size was calculated to be 415.

## Sampling method

A multi-stage sampling technique was used to recruit the respondents. Five out of the nine villages in the community were selected by a simple random sampling method of balloting. The five selected villages were Mbodo, Omuike, Omuoda, Omuoko and Omuokiri. This was followed by the identification of households of women of childbearing age in each of the five selected villages. The various households in each of the villages that were selected were then identified by house-to-house counting with the help of a representative of the Community. A total number of 3,332 households with a population of 15,110 women of childbearing age were identified at this stage. Proportionate size allocation of sub-samples to each of the villages based on the population of women of reproductive age was subsequently carried out from this identified population. Next, the selection of the allotted sub-samples of women of childbearing age for each of the five villages by simple random sampling method was carried out using a table of random numbers with the sampling frame generated for each of the villages. Thereafter, semi-structured questionnaires were distributed and used to derive our data.

### Data Collection Tool and Procedure

The questionnaire was created by the researchers (based on the objectives of the study and systematic literature search). Experts in the field of public health were given the questionnaire to review the substance, clarity, and relevance of each item on the instrument to the study.

The questionnaire was divided into five domains. Section A obtains information on the socio-demographic characteristics. Section B obtained information on the obstetrics and gynecological characteristics of the respondents. Section C documented the pattern of utilization of delivery health care services. Section D documented sociodemographic characteristics and Section E documented factors that influence the use of delivery health services.

The pretesting of the questionnaire was done in the Alakahia community, which is adjacent to the study area, it has a similar socio-demographic setting with the study population. Twenty respondents were interviewed using the questionnaire according to reliability testing carried out in a similar study.<sup>[8]</sup> The questions were properly explained to the respondents and in circumstances where there were communication challenges in the use of English Language, an interpreter was used. Each interview lasted for 15 minutes.

### Data collection

Data collection was carried out from house to house among mothers who met the inclusion criteria. The data for the study was collected by the researchers with the assistance of 10 trained research assistants. The data tool was tested for consistency and had a Cronbach coefficient of 0.792 before it was deployed for use in this study.

### Data analysis

Data from the questionnaires was extracted, coded, and entered in Microsoft Excel version 2010 and imported into the statistical package for social sciences (SPSS) version 25 for the data analysis. The dependent variables (outcomes) were utilization of delivery care services while the independent variables were socio-demographic characteristics and they include age of women, marital status, place of residence, tribe, education of women, occupation of women and husbands, religion of women followed by obstetrics and gynecological characteristics affecting utilization of delivery services. Categorical variables were presented in the form of frequencies and percentages (%) and summary statistics in means and standard deviations with results presented in tables and charts. A Chi-square test and bivariate logistic regression were performed to test between two or more categorical variables. A significant level was set at  $p \leq 0.05$  at a 95% confidence interval.

Ethical approval was obtained from the Ethical Committee of the University of Port Harcourt. Permission was also obtained from the community chiefs, women leaders, and the Community Development Committee (CDC) leaders of the selected villages in the Aluu community. Furthermore, informed consent was obtained from each respondent who agreed to participate in this study.

As shown in table 1a, respondents aged 19-29 years were slightly higher (50.36%). Most of the women were married (58.07%) and Christian's respondents were 88.19%. The Ikwerre tribe has the highest number of respondents with 120 (28.92%) while the least was the Ogoni's with 12 (2.89%).

**Results**

**Table 1a: Socio-demographic characteristics of respondents**

<b>Variable</b>	<b>Frequency (n=415)</b>	<b>Percent (%)</b>
<b>Age group(years)</b>		
19 – 29	209	50.36
30 – 39	145	34.94
40 – 49	61	14.70
<b>Mean age ±SD 29.9 ±7.7 years</b>		
<b>Marital status</b>		
Single	151	36.39
Married	241	58.07
Widowed	14	3.37
Divorced	1	0.24
Separated	6	1.45
Cohabitation	2	0.48
<b>Religion</b>		
Christian	366	88.19
Muslim	27	6.51
African Traditionalist	9	2.17
Others	13	3.13
<b>Tribe</b>		
Ikwerre	120	28.92
Ijaw	17	4.10
Ogoni	12	2.89
Ibo	72	17.35
Efik/Ibibio/Anang	45	10.84
Yoruba	77	18.55
Urohobo/Isoko	30	7.23
Others	42	10.12

**Table 1b: Socio-demographic characteristics of respondents**

<b>Variable</b>	<b>Frequency (n=415)</b>	<b>Percent (%)</b>
<b>Educational Status</b>		
No formal education	5	1.20
Primary	30	7.23
Secondary	287	69.16
Tertiary	93	22.41
<b>Occupation</b>		
Military/Uniformed Service	10	2.41
Professional/higher managerial occupation: Doctor, Lawyer, Engineer	16	3.86
Intermediate/lower managerial occupation: Banker, Teacher	94	22.65
Non-Manual skill occupation: Secretary, Business	58	13.98
Manual Skilled occupation: Tailor, Mason, Electrician, Carpenter	22	5.30
Partly skilled Occupation: Clerical officer, Trader	169	40.72
Unskilled occupation: Janitor, Day/night watchman	21	5.06
Never worked/unemployed	25	6.02
<b>Husband occupation</b>		
Military/Uniformed Service	14	3.37
Professional/higher managerial occupation: Doctor, Lawyer, Engineer	58	13.98
Intermediate/lower managerial occupation: Banker, Teacher	81	19.52
Non-Manual skill occupation: Secretary, Business	15	3.61
Manual Skilled occupation: Tailor, Mason, Electrician, Carpenter	33	7.95
Partly skilled Occupation: Clerical officer, Trader	43	10.36
Unskilled occupation	166	40.00
Never worked/unemployed	1	0.24
Others	4	0.96
<b>Monthly Income (₦)</b>		
<30,000	125	30.12
30,001 - 60,000	126	30.36
60,001 - 90,000	132	31.81
90,001 - 120,000	14	3.37
120,001 - 150,000	18	4.34
<b>Spouse monthly income (₦)</b>		
<30,000	135	32.53
30,001 - 60,000	121	29.20
60,001 - 90,000	129	31.08
90,001 - 120,000	15	3.61
120,001 - 150,000	15	3.61

Table 1b above shows that 287(69.16%) of respondents who had secondary education were in the majority. The partly skilled workers constituted the highest proportion (40.72%). Also, among the spouse's occupations, the highest number of the respondents (40%) belonged to the unskilled workers group. The respondents with the highest proportion (31.81%) earned ₦ 60,001- ₦90,000 per month and the spouse's monthly income with the highest proportion (32.53%) earned less than ₦ 30,000.

**Table 2: Obstetric and gynecological history of respondents**

Variable	Frequency(n=415)	Percent (%)
<b>Age of menarche</b>		
12 - 13 years	109	26.27
14 - 15 years	237	57.11
16 - 17 years	69	16.63
<i>Mean age ±SD 14.31± 1.30 years</i>		
<b>Number of Pregnancies</b>		
1	145	34.94
2 – 3	124	29.88
4 – 5	91	21.93
≥6	55	13.25
<b>Number of Deliveries</b>		
1	145	34.94
2 – 3	124	29.88
4 – 5	91	21.93
≥6	55	13.25
<b>No. of Miscarriages</b>		
0	380	91.57
1 – 2	30	7.23
≥ 3	5	1.20
<b>No. of Living Children</b>		
1 – 3	200	48.19
4 – 6	120	28.92
> 6	95	22.89
<b>Place of delivery during last pregnancy</b>		
Maternity	108	26.02
Faith-based	159	38.31
TBA	69	16.63
UPTH	20	4.82
PHC	40	9.64
Private clinic	19	4.58
<b>Duration since last pregnancy</b>		
1 – 2 years	209	50.36
3 years	206	49.64

Table 2 shows that most mothers 220 (53.01%) had their menarche at age 14-15 years. Also, 145(34.94%) of mothers had one pregnancy and delivery respectively. Those who have 1-3 living children were the highest number of respondents with 48.19%. Respondents who did not have miscarriages were in the majority (91.57%). Furthermore, 159 (38.31%) of respondents delivered in faith-based centers followed by those who delivered in private maternities (26.02%), traditional birth attendants (16.63%), primary health centers (9.64%), UPTH (4.82%), and private clinics (4.58%).

**Table 3: Utilization of delivery services among mothers in the Aluu community**

<b>Variable</b>	<b>Frequency(n=415)</b>	<b>Percent (%)</b>
<b>Delivered in the past 3 years</b>		
Yes	293	70.60
No	122	29.40
<b>Place of delivery (n=293)</b>		
Health facility	129	44.03
Others	164	55.97
<b>Delivery in a health care facility(n=129)</b>		
Primary Health Care Center	65	50.39
Maternity home	41	31.78
UPTH	12	9.30
Private hospital	11	8.53
<b>Other places of delivery (n=164)</b>		
Faith-Based	89	54.27
TBA	44	26.83
Home	31	18.90
<b>Reason for not delivering in healthcare facility (n=164)</b>		
Lack of faith/confidence in the health worker	66	40.24
Spouse Choice	33	20.12
Distance	30	18.29
Prefer TBA	14	8.54
Opinions of friends/relations	12	7.32
No particular reason	9	5.49
<b>Method of delivery (n=293)</b>		
Spontaneous	154	52.56
Assisted	90	30.72
Cesarean Section	49	16.72
<b>Outcome of delivery</b>		
Live birth	257	87.71
Stillbirth	21	7.17
A live baby that died immediately	15	5.12

Table 3 shows that 293 (70.60%) respondents delivered in the last 3 years. In this study, 129 (44.03%) mothers delivered in a healthcare facility while 164(55.97%) did not deliver in a healthcare facility. Among the 129 respondents that delivered in a healthcare facility, 65(50.39%) delivered in a primary healthcare center, 41(31.78%) delivered in a maternity home, 12(9.30%) delivered at UPTH and 11(8.53%) delivered in a private clinic.

The remaining 164 (55.97%) respondents delivered in other places (non-healthcare facilities). In this category, more than half of the respondents delivered in faith-based centers (54.27%), 26.83% delivered in TBA and 18.90% delivered at home. In addition, the respondents who claimed that lack of confidence/faith was responsible for the non-utilization of delivery services in a healthcare facility constituted the highest proportion (40.24%). Also, mothers whose method of delivery was spontaneous constituted the majority (52.56%) and most of them had live births (87.71%).

**Table 4a: Relationship between socio-demographic factors and utilization of delivery services**

Variable	Utilized n =129 (%)	Not utilized n = 164 (%)	Total n = 293 (%)	$\chi^2$ .( p-value)	OR (95% CI)
<b>Age group(years)</b>					
≥40	28 (45.9)	33 (54.1)	61 (100.0)	0.10 (0.740)	1.1 (0.6 – 1.9)
<40	101 (43.5)	131 (56.5)	232 (100.0)		
<b>Marital status</b>					
Married/Cohabiting	102 (42.3)	139 (57.7)	241 (100.0)	1.59 (0.205)	1.47R (0.81 – 2.68)
Single/Divorced/Separated	27 (51.9)	25 (48.1)	52 (100.0)		
<b>Religion</b>					
Christian	119(48.77)	125(51.23)	244(100.00)	13.32(0.0005) *	3.7 (1.7 – 7.7)
Others	10(20.41)	39(79.59)	49(100.00)		
<b>Tribe</b>					
Ikwerre	49 (52.7)	44 (47.3)	93 (100.0)	17.72(0.0133) *	NA
Ijaw	4 (28.6)	10 (71.4)	14 (100.0)		
Ogoni	3 (25.0)	9 (75.0)	12 (100.0)		
Ibo	34 (54.8)	28 (45.2)	62 (100.0)		
Efik/Ibibio/Anang	6 (22.2)	21 (77.8)	27 (100.0)		
Yoruba	0 (0.0)	2 (100.0)	2 (100.0)		
Urhobo/Isoko	27 (43.6)	35 (56.5)	62 (100.0)		
Others	6 (28.6)	15 (71.4)	21 (100.0)		

R- Reciprocal odds ratio \* statistically significant



Table 4a shows that there is a statistically significant relationship between tribe, religion, and the utilization of delivery services. Respondents that are Christians utilized delivery services more than the others (48.77% vs 20.41%). Respondents who are Christians were 3.7 times more likely to utilize delivery services than the other religion (OR: 3.7; 95% C I: 1.7-7.7; p=0.0005).

Also, the tribe was found to be significantly associated with the utilization of delivery services (p=0.0133) Respondents who belong to the Igbo and Ikwerre tribes utilized delivery services more than the other tribes in the community (54.8% and 52.7%). On the other hand, there was no statistically significant relationship between age, marital status, and the utilization of delivery services (p>0.05).

Table 4b shows that there is a statistically significant relationship between education, respondent's occupation, spouse's occupation, and the utilization of delivery health services.

Respondents who had at least secondary education used delivery health services more than those who had primary education (46.1% VS 28.6%). Respondents that had at least secondary education were 2.1 times more likely to use delivery health care services than those with only primary education (O R: 2.1;95% C I:0.9-4.6; p=0.049). Furthermore, there was a statistically significant relationship between respondents and utilization of delivery care services (p=0.005). Respondents that belonged to the intermediate occupation had the highest proportion of utilization of delivery health care service (60.80%) followed by the partly skilled occupation (51.80%) while those in the military/uniformed occupation were third with 50%.

Respondent whose spouse was unemployed utilized delivery care services the most (100%) followed by unskilled workers (54.55%) and the third was those that are professionals (48%).

However, there was no significant relationship between the respondent's monthly income, the spouse's monthly income, and the utilization of delivery healthcare services.

Table 5 shows that there is a statistically significant relationship between the age of menarche, number of pregnancies, number of deliveries, number of miscarriages, number of living children, place of delivery and duration since the last pregnancy, and utilization of delivery care services. For age at menarche, respondents who had their menarche at age 10-13 years used delivery care services more than those who had menarches at age 14 years and above (57.9% vs 39.25%). Respondents who had their menarche at age 10-13 years were 2.1 times more likely to utilize delivery care services than those of age 14 years and above (OR: 2.1; 95% CI: 1.2-3.6; p=0.004). Respondents who had 1-2 pregnancies utilized delivery care services than those who had 3 and above pregnancies (76.9% vs 25.9%). Respondents who had 1-2 pregnancies were 9.5 times more likely to utilize delivery care services than those that had 3 and above pregnancies (OR: 9.5; 95% C I: 5.4-16.7; p=0.0001).

Furthermore, respondents who had 1-3 deliveries utilized delivery services more than those who had 4 and above deliveries (53.6% vs 31.2%). Respondents that had 1-3 deliveries were 1.5 times more likely to use delivery service than those that had 4 and above deliveries (O R: 1.5; 95% C I: 1.5-4.1; p=0.0001). Following, respondents who had at least 1 miscarriage utilized delivery services more than those who had no miscarriage (80% vs 40.7%).

Respondents who had 1-3 children utilized delivery services than those who had 4 and above children (48.98% vs 34.02%). Also, respondents that had 1-3 children were 1.9 times more likely to utilize delivery services than those that have 4 children and above (OR:1.9; 95% CI: 1.1-3.1; p=0.0152).

**Table 4b: Relationship between socio-demographic factors and utilization of delivery services**

Variable	Utilized n =129 (%)	Not utilized n =164(%)	Total n=293(%)	$\chi^2$ (p-value)	OR (95% C.I)		
<b>Educational Status</b>							
At least Secondary	119 (46.1)	139 (53.9)	258 (100.0)	3.85 (0.049) *	2.1 (0.9 – 4.6)		
Primary or below	10 (28.6)	25 (71.4)	35 (100.0)				
<b>Occupation</b>							
Military/Uniformed Service	5 (50.0)	5 (50.0)	10 (100.0)	26.08 (0.005) *	NA		
Professional	3 (20.0)	12 (80.0)	15 (100.0)				
Intermediate	31 (60.80)	20 (39.2)	51 (100.0)				
Non-Manual skill	15 (39.5)	23 (60.5)	38 (100.0)				
Labourers	9 (40.9)	13 (59.1)	22 (100.0)				
Partly skilled Occupation	59 (51.80)	55 (48.3)	114 (100.0)				
Unskilled occupation	3 (16.7)	15 (83.3)	18 (100.0)				
Never worked/unemployed	4 (16.0)	21 (84.0)	25 (100.0)				
<b>Spouse's occupation</b>							
Military/Uniformed Service	4(26.67)	11(73.33)	15(100.00)			0.0156 <sup>F</sup>	NA
Professional	24(48.00)	26(52.00)	50(100.00)				
Intermediate	31(46.97)	35(53.03)	66(100.00)				
Non-Manual skill	7(46.67)	8(53.33)	15(100.00)				
Labourers	6(18.18)	27(81.82)	33(100.00)				
Partly skilled Occupation	20(46.51)	23(53.49)	43(100.00)				
Unskilled occupation	36(54.55)	30(45.45)	66(100.00)				
Never worked/unemployed	1(100.00)	0(0.00)	1(100.00)				
Others	0(0.00)	4(100.00)	4(100.00)				
<b>Monthly income</b>							
60,000 or less	67(46.21)	78(53.79)	145(100.00)	0.55(0.456)	1.1 (0.7 – 1.8)		
More than 60,000	62(41.89)	86(58.11)	148(100.00)				
<b>Spouse monthly income</b>							
60,000 or less	83 (48.5)	88 (51.5)	171 (100.0)	3.39 (0.066)	1.5 <sup>R</sup> (0.9 – 2.50)		
More than 60,000	46 (37.7)	76 (62.3)	122 (100.0)				

O.R- Reciprocal odds ratio, F-Fischer exact, \*statistically significant, NA: Not Applicable

**Table 5: Relationship between obstetrics and gynecology history of respondents and utilization of delivery services.**

Variable	Utilized n=129 (%)	Not utilized n =164 (%)	Total n = 293(%)	χ <sup>2</sup> (p-value)	OR (95% C.I)
<b>Age of menarche</b>					
10 - 13 years	44 (57.9)	32 (42.1)	76 (100.0)	8.1 (0.004) *	2.1 (1.2 – 3.6)
14 years and above	85 (39.2)	132 (60.8)	217 (100.0)		
<b>Number of Pregnancies</b>					
1 -2	80 (76.9)	24 (23.1)	104 (100.0)	70.7 (0.0001) *	9.5 (5.4 – 16.7)
3 and above	49 (25.9)	140 (74.1)	189 (100.0)		
<b>Number of Deliveries</b>					
1 – 3	90 (53.6)	78 (46.4)	168 (100.0)	14.5 (0.0001) *	1.5 (1.5 – 4.1)
4 and above	39 (31.2)	86 (68.8)	125 (100.0)		
<b>No. of Miscarriages</b>					
None	109 (40.7)	159 (59.3)	268 (100.0)	14.35(0.0001) *	7.29R(2.71-19.64)
At least 1	20 (80.0)	5 (20.0)	25 (100.0)		
<b>No. of Living Children</b>					
1 – 3	96(48.98)	100(51.02)	196(100.00)	5.89 (0.0152) *	1.9 (1.1 – 3.1)
4 and above	33(34.02)	64(65.98)	97(100.00)		
<b>Place of delivery during last pregnancy</b>					
Health center/Maternity	100 (56.5)	77 (43.5)	177 (100.0)	28.2 (0.0001) *	3.8 (2.3 – 6.5)
Faith-Based/TBA	29 (25.0)	87 (75.0)	116 (100.0)		
<b>Duration since last pregnancy</b>					
1 – 2 years	89 (50.0)	89 (50.0)	178 (100.0)	6.56 (0.010) *	1.8 (1.1 – 3.0)
3 years	40 (34.7)	75 (65.3)	115 (100.0)		

R- Reciprocal odds ratio, \* statistically significant

Mothers who delivered in a healthcare facility (PHC, UPTH, private clinic, maternity) utilized delivery services more than those who delivered in a non-healthcare facility (faith based, TBA, chemist) (56.5% vs 25%). Those who delivered in a healthcare facility were 3.8 times more likely to utilize delivery services than those who delivered in a non-healthcare facility (OR:3.8;95% CI: 2.3-6.5, p=0.0001). Also, respondents who delivered in the last 1-2 years used delivery services more than those who delivered in the last 3 years (50 % vs 34.7%). Respondents who delivered in the last 1-2 years were 1.8 times more likely to use delivery care services than those who delivered in the last 3 years (OR: 1.8;95% CI: 1.1-3.0, p=0.010).

**Discussion**

**Socio-demographics:** This study shows that most of the respondents (50.36%) fell within the age range as shown in table 1a and 1b (Mean age was 29.9 ±7.7 years). The majority were Christians, educated, and were from the Ikwerre tribe. This could be attributed to the locality where the study was conducted (semi-urban community) where there was dominance of younger, educated women and mostly indigenes. Similar studies by Nuamah et al in 2019 showed that the majority of the respondents fell within the same age range of 20-29 years besides being Christians and educated. [8]

**Obstetrics and gynecology history:** Furthermore, more than half of mothers 220 (53.01%) had their menarche at age 14-15 years, and 34.94% of mothers had one pregnancy and delivery respectively as shown in Table 2. Most of the participants were women who had 1-3 living children and did not have miscarriages. Possible explanations could be that most respondents who had their menarche at an early age were more likely to engage in sexual activity and thus become pregnant. A similar study affirmed that early menarche could lead to teenage pregnancies and deliveries.<sup>[9]</sup> This is because it predisposes a woman to early sexual activity which can lead to early pregnancies and therefore early utilization of delivery services.

**Utilization of delivery services:** The majority of the respondents in our study 164 (55.97%) delivered in non-healthcare facilities while 129 (44.03%) respondents delivered in a healthcare facility as shown in Table 3. The reasons could be that there is a huge preference for unorthodox centers, faith-based centers/spiritual clinics, and traditional birth centers. Deliveries at churches and traditional birth attendants are a common practice, especially in this part of the country.<sup>[10]</sup> Cultural and religious beliefs play a major role in influencing the choice of delivering in these places.<sup>[11]</sup> From the results, women who were not satisfied with the services offered at primary healthcare facilities were more likely to deliver at a faith-based center or a traditional birth attendant. It could be because of the friendlier atmosphere, one-on-one care with mothers, spiritual upliftment, spiritual assistance, and assurance. Such services might not be obtainable in a healthcare facility. The findings from a previous study conducted in a similar environment agree with the high level of preference using delivery services in an unorthodox center.<sup>[12]</sup> However, findings from a study by Johnson et al. in 2020 reported a different scenario where respondents delivered in a health facility (64.9%), traditional birth attendant's place (23.3%), respondent's residence (6.3%), and church (5.4%). Similar reasons such as cost, distance, and attitude of health workers influenced these choices.<sup>[13]</sup> Furthermore, to support our findings another similar study revealed that 55.7% of women delivered in PHCs and 30.9% delivered outside health institutions Fabusiwa et al. 2016 reported in their study that 46.6% of respondents gave birth in church-based maternities centers and 35% preferred it for future deliveries.<sup>[14]</sup>

**Factors determining the utilization of delivery services:** Utilization of delivery services, was grouped into those that utilized healthcare facilities and those that did not utilize healthcare facilities. Religion, tribe, educational status, respondent's occupation, and spouse's occupation were found to be statistically significantly associated with the utilization of delivery services as shown in Tables 4a and 4b.

For religion, it was discovered that Christians utilized delivery services in a healthcare facility than other faiths. They were 3.7 times more likely to utilize delivery services (OR: 3.7; 95% C I: 1.7-7.7, p=0.0005). This is because Christians dominated the study population. This finding agrees with a study by Umar in 2017 where it was reported that Christians were 5 times more likely to deliver in a healthcare facility than Muslims (UOR: 5.181; 95%: C I: 4.844-5.542). Their reason was that Christian folks were more liberal in accessing delivery health care in respective of the gender of the service providers.<sup>[15]</sup> In contrast to our findings, Fasiku et al. in 2018 reported that Muslims delivered in a healthcare facility more than their Christian counterpart (79.9% vs 69.9%). The main reason was that the study was conducted in Kwara state which is a Muslim-dominated state. This accounts for the higher proportion of utilization of delivery services in that study population. Also, another reason was that Christians tend to patronize the services of spiritual homes more than their Muslim counterparts in that study population.<sup>[16]</sup>

Furthermore, the Igbo tribe was found to have utilized a healthcare facility more than other tribes (54.8%). Emmanuel et al confirmed this in their study where they reported that the majority of the respondents from the Igbo tribe utilized delivery services from a healthcare facility (92.7%) than non-healthcare facilities when compared with other tribes.<sup>[17]</sup>

Education is a key component in deciding how often delivery services are used. Respondents with secondary education or higher used delivery health services in a healthcare facility more frequently than those with only a primary school education or no education at all (OR: 2.1; 95% C I; 0.9-4.6,  $p=0.049$ ). Mothers with advanced educational qualifications are more likely to deliver in a healthcare facility because they are more knowledgeable and more aware of the benefits and importance of delivering in a hospital-based facility. Also, they have an in-depth understanding of the consequences of delivering in a non-healthcare facility. This study agrees with a previous study by Fasiku et al in 2018 where it was reported that women with secondary education were two times more likely to deliver in health facilities compared with those with no education (AOR=2.337, CI=1.178-4.637).<sup>[16]</sup> Emmanuel et al in their study reported that respondents with secondary and tertiary education were more likely to deliver in a hospital setting ( $p<0.001$ ).<sup>[17]</sup>

Mother's occupation was statistically significantly associated with the utilization of delivery services ( $p=0.005$ ). Respondents whose occupations belong to the intermediate category (banker, teacher) utilized delivery services more than other occupations. This category of people is educated, knowledgeable, and well-informed by virtue of their occupations. Also, they possess the financial capacity based on their income earnings to afford delivery in a health care facility. Previous studies support the fact that occupation plays a vital role in the ability to access delivery care services. Eyassau & Kassa in 2021 reported that respondents who were government-employed were 3.35 times more likely to deliver in a healthcare facility than those who are housewives. (OR: 3.35; 95% C I: 1.79-6.27).<sup>[18]</sup> The rationale was that mothers in this category had a higher income and were better informed on how to obtain safe delivery services. Mitikie et al in 2020 reported a similar finding where government-employed women were 2.05 times more likely to use institutional delivery care services as compared with housewife women (AOR = 2.05; 95% CI: 1.00–4.18). In addition, private/self-employed women were 2.42 times more likely than housewives to use an institutional delivery service (AOR = 2.42, 95 % CI: 1.095-3.5). Mothers who had a job that paid well were more likely to be able to afford delivery services.<sup>[19]</sup>

A spouse's occupation was found to be significantly associated with the utilization of delivery care services. ( $p=0.0085$ ). In this study, it was found that respondents whose spouse was unemployed utilized delivery care services. Reasons could be that other predisposing factors like the wife's occupation could influence the utilization of delivery care services. If the wife is financially capable irrespective of her husband's unemployed status, then she will be able to support herself to deliver in health care facility. Zelalem et al. 2014 in their study showed that women married to merchants were more likely to use institutional delivery compared to women married to farmers. This was because they were able to finance the cost of delivering in a healthcare facility.<sup>[20]</sup>

Obstetrics and gynecology characteristics have been found to influence the utilization of delivery services in our study as shown in table 5. Age at menarche, number of pregnancies, number of deliveries, number of miscarriages, number of living children, place of delivery, and duration since last pregnancy were significantly associated with the utilization of delivery services. Respondents who had their menarche at ages 10-13 years were 2.1 times more likely to utilize delivery services. Early menarche predisposes a woman to early sexual activity. This can lead to early pregnancies and therefore lead to the utilization of delivery services. Although the literature doesn't feature the direct relationship between age at menarche and the utilization of delivery care services, it could be explained that respondents who had their menarche at an early age can be sexually active at a young age and thus get pregnant. They will in turn require delivery services.<sup>[21]</sup>

The number of pregnancies was found to be associated with the utilization of delivery services. Women who had 1-2 pregnancies were 9.5 times more likely to use delivery services than those who had 4 and above pregnancies. Mothers with 1-2 pregnancies are more enthusiastic about their health during

pregnancy. They tend to deliver in a healthcare facility for quality and safe care but in subsequent deliveries, they feel they have more experience and therefore look for other places to deliver other than healthcare facilities. [21]

Furthermore, the number of deliveries was significantly associated with the utilization of delivery services. Women with 1-3 deliveries used delivery services of a health care facility more than those with 4 and above deliveries. They were 1.5 times more likely to deliver in a healthcare facility than those with 4 and above deliveries. This was because the decreased family size would encourage the utilization of delivery services due to reduced financial obligation. This is in contrast with a study by Manyeh et al. in 2017 where it was documented that women who had 5 deliveries (grand multiparity) had higher odds of using skilled birth attendants than those who had only 1 delivery. [22] Nonetheless, this study agrees with the findings of Mitikie et al in 2020 where they reported that women who were multiparous up to five deliveries were less likely to deliver at the health care facility as compared to those with fewer deliveries (AOR = 0.49, 95%CI: 0.25–0.95). [19]

Moreover, the number of miscarriages also affects the utilization of delivery services. Women with at least 1 miscarriage were 7.29 times more likely to use delivery care in a healthcare facility than those who had no miscarriage. Miscarriages are unfortunate losses that occur in the life of a woman therefore, the more a woman experiences miscarriage, the more she tends to seek delivery services in a health care facility in her subsequent pregnancies to avoid complications. This finding agrees with a similar study by Manyeh et al in 2017 where it was reported that women who had several live births were 65% less likely to be delivered by a skilled birth attendant than those who suffered miscarriages during pregnancy/childbirth. Women who had complications during pregnancy and deliveries will be more open to using health care specialized services in subsequent pregnancies than those who had no challenges during pregnancies and deliveries. [22]

Likewise, mothers who have 1-3 children were 1.9 times more likely to deliver in a healthcare facility than those who have 4 children and above. This is in line with the study by Damiah et al in 2020 where women with 2 children were less likely to be delivered by a skilled birth attendant compared to those with 1 child (OR: 0.52: 95% C I: 0.33-0.79, p=0.003). Mothers who have gone through multiple deliveries were less likely to deliver in a healthcare facility because they feel they are more experienced about the birthing process and so can take the risk of delivering in a non-healthcare facility. [23]

An increase in household size will lead to an increase in financial demands that can lead to financial incapability on the part of the mother. This will lead to poor utilization of delivery services. The reason for this is not far-fetched. Moreover, respondents who delivered in a health facility during their last pregnancy were 3.8 times more likely to deliver in a health facility than those who delivered in a non-health center. This could be because of good experiences during their previous pregnancies. This is in line with the findings of a similar study by Fagbamigbe et al in 2017 where it was reported that mothers who used Skilled Birth Attendant (SBA) for previous pregnancies had higher tendencies to deliver in a healthcare facility. The utilization of SBA at previous delivery and adequate ANC visits also increased the likelihood of the utilization of SBA facilities by 37 (OR =36.9; 95% CI =34.1–39.9) and 98 (OR =97.9; 95% CI =89.3–107.3). [24]

This study also showed that mothers whose duration after their last pregnancy was 1-2 years were 1.8 times more likely to use delivery services than those whose duration after the last pregnancy was 3 years ago. It could be that mothers who were pregnant might have suffered losses during the pregnancy out of preventable complications and conceived immediately to make up for their losses. This accounts for the limited duration between previous pregnancies and present deliveries. To support this finding, Schliep et al in 2016 showed that couples with less than 3 months post miscarriage conceived and achieved live

births more than those >3 months post miscarriage 76.7% versus 23.4%. [25] Also, it could be that mothers began sexual activity a few weeks post-delivery and conceived within short intervals leading to the utilization of ANC/delivery services.

### Study limitation

During the data collection, some participants were not open about some of the questions that were asked, especially regarding their income and gynecological history, and this can produce interviewee-biased answers.

### Conclusion

More than half of the respondents delivered in non-healthcare facilities. Utilization of healthcare delivery services is desirable and should be encouraged because it can improve the health outcomes of women, especially in their reproductive age. Socio-demographic and obstetrics/gynecological characteristics played a very important role in the utilization of delivery services by the mothers living in the Aluu community, Ikwerre local government area.

### Recommendation

Healthcare empowerment programs at the grassroots levels in communities should be organized with an emphasis on creating awareness of the benefits of delivering in a government-approved healthcare facility.

There should be supervision of practices of non-orthodox health practitioners especially the faith-based centers and TBA if they must be allowed to function in our communities as this will ensure that the providers are given some basic training on proper patient handling, adoption of safety measures and identification of red flags. They should be taught how to make prompt referrals to appropriate healthcare facilities located in and outside the communities. Finally, poverty alleviation programs should be carried out in the communities to help mothers afford the cost of maternal services.

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