

# Socio-Demographic Predictors of Maternal HealthCare Services Utilization among Advanced Reproductive Age Women in Lagos, Nigeria

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## ABSTRACT

*Little empirical knowledge exists on factors influencing the utilization of maternal healthcare services by women of advanced reproductive age (ARA) in Nigeria. The utilization of maternal healthcare services (MHCS) by women of ARA is an essential determinant of the degree of risks of maternal health outcomes. Thus, the study examined the socio-demographic predictors of maternal healthcare services utilization among advanced reproductive age women in Lagos State. The study used a cross-sectional survey to elicit data from 576 ARA women aged 30 years and above using multistage sampling techniques. Data analysis involved univariate (descriptive), bivariate (chi-square), and multivariate (Logistic Regression). This study established that several socio-demographic factors (maternal age, marital status, ethnicity, religious affiliations, religiosity, literacy, spousal level of education, employment status, level of income, and area of residence) significantly predicted the utilization of MHCS indicators (received Antenatal Care (ANC) for last pregnancy, timing of first ANC visit, adherence to medical instructions, and delivery by a healthcare professional) ( $p < 0.05$ ). Maternal and partner's level of education were strong predictors of utilization of MHCS among ARA women. ARA was significantly related to better utilization of MHCS. Therefore, policy intervention programs should extend MHCS to compulsorily include prenatal care and general reproductive health education for all women of reproductive ages.*

*Keywords:* socio-demographic, maternal healthcare service, advanced reproductive age.

## INTRODUCTION

The proportion of women delaying childbirth to their late 30s and beyond has increased. It is a reproductive reality in both developed and developing societies. Women engaging in reproductive activities at such age are considered as advanced reproductive age (ARA). ARA is globally becoming a growing social phenomenon.

In the last few decades, there has been a gradual increase in the proportion of women giving birth after 35 years of age worldwide (Garcia et al., 2022), making ARA an important research focus. Women are prolonging motherhood to accommodate their careers and improve socioeconomic status by investing more time (years) in pursuing education and career goals before starting a family (Beaujouan and Sobotka, 2019; Ibebuike et al., 2021). In Nigeria particularly, where there are high levels of gender inequality, inadequate jobs and employment insecurity, a general preference for completing education and participating in the labour force before childbearing has been among women (Wusu and Adedokun, 2018; Amoo, 2020).

Health seeking behaviour (HSB) of ARA women is an essential determinant of the degree of risk of maternal morbidity and mortality. The increase in the proportion of women giving birth after 35 years of age as against women between the ages of 20-34 years is igniting researchers' interest in the HSB of such women. Unfortunately, it appears limited documented empirical information exists on HSB of ARA women.

HSB of mothers via their utilization of maternal healthcare services (MHCS) have a high impact on their lives and on their children (Agbaje *et al.*, 2016). As such, improving HSB of women of ARA vis-à-vis the utilization of MHCS could prevent many avoidable deaths and complications (Lassi *et al.*, 2016). MHCS comprises of antenatal care (ANC), health institutions-based delivery (delivery by skilled professionals), and postpartum care. HSB and utilisation of MHCS are proximate factors that influence maternal outcomes in every society (Udeh *et al.*, 2015). Over the last three decades, Nigeria has persisted in being one of the countries with very high maternal mortality ratio. Currently, Nigeria accounts for about 28.5% of global maternal deaths (World Health Organization, 2023). This statistics suggests that maternal mortality remains an issue calling for attention in Nigeria.

This high maternal mortality ratio is accompanied by high fertility rates, which increases the obstetric risk of the Nigerian woman (WHO, 2023). Also, the risk of maternal mortality and morbidity of women in Nigeria is escalated by their poor health-seeking practices (Akeju *et al.*, 2016). It is against this background that this study sought to examine the utilization of MHCS among women of ARA.

Studies on maternal HSB are enormous. However, detailed empirical data on ARA women's HSB in sub-Saharan Africa are limited. This is so, perhaps, because age at first marriage remains largely early in the affected communities. In recent times, however, postponement of marriage has become popular due to emerging social and economic realities. Thus, women getting involved in reproductive activities at advanced age is likely to be a norm in sub-Saharan Africa with time. It is therefore imperative to begin to explore the HSB of ARA vis-a-vis MHCS. This study is thus believed to be apt.

Contradicting evidence abound in the literature around increasing maternal age

and utilisation of MHCS. For example, Fitzpatrick et al. (2016) in their study among reproductive-aged women in the United Kingdom, reported that women above 35 years booked for more antenatal visits. Similarly, Opadiran et al. (2018) and Solanke et al. (2022) also observed in their respective studies among reproductive-aged women in Nigeria that older women (35 years and above) booked earlier at health facilities for ANC. Not only were women of ARA found to book and utilise more ANC visits than younger women, but studies also reveal that they were also found to have more ANC follow up and adherence to instructions given them by health providers (Ediris et al., 2018; Teshale & Tesema 2020). This is assumed to be out of concern for the pregnancy and awareness of the risks associated with conception at such a late reproductive age.

In the same vein, women who utilised more ANC visits were found to have facility-based deliveries (Dahiru & Oche, 2015; Tsawa *et al.*, 2015). Given the antecedent of having more ANC visits, it was not surprising that some studies reported that older reproductive women preferred institution-based delivery than their younger counterparts (Agunwa *et al.*, 2017; Oni & Fagbeminiyi, 2017).

Older women were identified to seek more of MHCS during pregnancy, particularly older primiparous women (Agbaje *et al.*, 2016; Fitzpatrick *et al.*, 2016; Agunwa *et al.*, 2017; Oni & Fagbeminiyi, 2017). This could allude to the fact that they are more educated than their younger counterparts and could comprehend the importance of utilizing MHCS much more and can also afford it.

In contrast, some studies reported a negative association between increasing maternal age and MHCS utilisation. In a survey among reproductive aged women in Nepal, Adhikari (2016), reported that ARA women are less likely to use MHCS than younger women. Also, Wilunda *et al.* (2015) and Mugo *et al.* (2015) reported in their studies that ARA was negatively associated with the utilisation of MHCS in Ethiopia and Sudan, respectively.

Clearly, there exists inconsistency in existing literature relating women's age to their HSB. This study sought to contribute to knowledge on the relationship between maternal age and HSB with the intension to address this apparent inconsistencies in literature.

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This study is anchored on the Health Belief Model (HBM). HBM was developed in 1966 to predict health stimulating behaviour, by social psychologists in the United States. It is an individual-focused theory, which seeks to predict human health. It presents a set of simple beliefs that explain the impact of various variables on health be-

haviour (Abraham & Sheeran, 2015). HBM contains six belief components that predict why people will take action to prevent or control illness situations, namely:

- i. Perceived susceptibility
- ii. Perceived severity
- iii. Perceived benefits
- iv. Perceived barriers
- v. Cues to action
- vi. Self-efficacy

Perceived susceptibility concerns the degree of vulnerability an individual feels about an illness. Thus, if an ARA woman feels vulnerable during pregnancy, she may take action. Otherwise, she may not take action with respect to utilization of MHCS (Montanaro & Bryan, 2014).

Perceived severity refers to an individual's assessment of how precarious a health threat may be to their life (Montanaro & Bryan, 2014). Thus, women who perceive pregnancy as a delicate period for them and their unborn child will do all they can to utilize MHCS.

Perceived benefits address the belief in the effectiveness of the available actions to reduce the severity of health threats. This implies that the channel of healthcare that women of ARA utilize is a reflection of their trust in the efficacy of the healthcare provider.

Perceived barriers refer to the perceived impediments of an action to improve a health condition (Montanaro & Bryan, 2014). An unconscious cost-benefit analysis usually occurs where individuals weigh the expected benefit of an action against the perceived barriers. Perception about these impediments could be barriers to MHCS utilization among women of ARA.

Cues to action are incentives that propel an individual to decide to carry out a recommended health action and they could be internal or external while self-efficacy refers to the capability of women to utilize appropriate MHCS needed to achieve uneventful and uncomplicated pregnancy and delivery.

## **METHODS**

The study adopted a cross-sectional survey design. The data collection exercise deployed a structured questionnaire that was administered to women of ARA in selected locations within Lagos State, using a face-to-face approach. The population for this study were women between 30 and 49 years of age who were pregnant or recently delivered

and residing in Lagos State. A multi-stage probability sampling technique involving six stages was used. This was adopted because of the absence of a reliable sample frame for the study population in Lagos State.

The first stage involved the division of administrative divisions within Lagos State into two strata, namely urban and mostly rural. One division was randomly selected from each stratum. Secondly, two LGAs were randomly selected from each division. The third stage consists of a random selection of one local council development area (LCDA) from each LGA. At the fourth stage, two wards were randomly selected from each LCDA, giving us a total of eight wards. The fifth stage involved the identification of the main streets in each selected ward and the random selection of two streets, giving a total of sixteen streets. At the final stage, systematic sampling technique was used to select households (using 1/5th sampling fraction). From each household, only one eligible respondent was selected, and if there was none, the next household was selected and the study's questionnaire was administered to the selected respondent. Seven research assistants were recruited and trained to assist in the data collection exercise. The data collection spanned between May and July 2021.

The questionnaire was pretested on a pilot sample of 40 respondents in Ojo LGA (not listed for the main survey), after which it was revised before administration in a study sample involving 576 ARA women in Lagos.

SPSS version 20 was used to conduct univariate, bivariate and multivariate statistical analyses. The univariate analysis involved the use of descriptive tools to provide a comprehensive description of the background characteristics of respondents and variables in the study, bivariate analysis used the chi-square technique while logistic regression statistical techniques was used to build multivariate models. P-values at the threshold of less than .05 ( $<0.05$ ) were considered statistically significant.

In line with the ethical principles of social research, informed consent was obtained after the participants were informed of the purpose of the study and assured of confidentiality and anonymity. Respondents were told they could withdraw from the study at any point they feel they cannot continue. In addition, ethical approval was obtained from the Ethical Committee of the Lagos State University College of Medicine (LREC/06/10/1562).

## FINDINGS

The important socio-demographic characteristics of respondents were reported in Table 1, where age distribution reveals that 48.8% were between ages 35–39 years, which is consistent with the study population. The vast majority of the respondents (98.6%) were ever married, revealing that much importance is still attached to the marriage institution in the study settings. From Table 1, the respondents were predominantly Yoruba (74.9%), this is not surprising as the location of the study is in a Yoruba state.

The table also revealed 61.2% of respondents as Christians and this is consistent with the religious landscape of the state as Christianity has witnessed unprecedented growth over the years in southern Nigeria. The table further revealed that the majority of the respondents were found to be religious, in view of the fact that over 60% indicated regular attendance of religious meetings. This suggests that women of ARA are religious.

Surprisingly, all respondents had a form of education, with majority (50%) having just basic education, while most of their partners had tertiary education (58.9%). Also, majority of the respondents (54.2%) were economically engaged either in their personal informal enterprises (39.6%) or in civil employment (14.7%) thereby revealing the desire for financial independence among women of ARA.

**Table 1: Percentage distribution of survey respondents by selected socio-demographic characteristics**

Characteristics	N	(%)
Local council development area		
Eredo	41	7.1
Ibeju-Lekki	22	3.8
Ikeja	106	18.4
Ayobo-Ipaja	407	70.7
Total	576	100
Age		
30-34	111	19.3
35-39	252	46.8
40-44	146	25.3
45-49	67	11.6
Total	576	100
Marital status		
Never married	8	1.4
Ever married	551	98.6
total	559	100
Ethnic group		
Hausa	26	4.6
Igbo	100	17.6
Yoruba	426	74.9
Others	17	3.0
Total	569	100
Religious affiliation		
Christianity	352	61.2
Islam	209	36.3
Traditional	14	2.4
total	575	100
Attendance of religious activities		
Less frequently	64	11.2

Characteristics	N	(%)
Frequently	71	12.4
More frequently	90	15.7
Most frequently	348	60.7
Total	573	100
Educational qualification		
Basic education	309	54.0
Secondary education	123	21.5
Tertiary education	140	24.5
Total	572	100
Spouse's educational qualification		
No formal education	9	1.6
Basic education	18	3.2
Secondary education	203	36.3
Tertiary education	330	58.9
Total	560	100
Employment status		
Unemployed	250	45.8
Self-employed	216	39.6
Employed	80	14.7
Total	546	100
Number of living children		
1-2	174	30.2
3-4	324	57.3
5 and above	67	11.9
Total	565	100
Characteristics	N	(%)
Income categories		
Below 30,000	204	49.6
35000-90,000	161	28.0
Above 100,000	46	8.0
Total	411	100

Furthermore, the sample reflects a low-income level, because only 28.0% earn above the national minimum wage of ₦30,000. The table also revealed a slight majority (57.3%) reported three to four living children, this echoes the fertility rate of Lagos state which is four children per woman.

Table 2 shows the distribution of women of ARA by HSB indicators. Generally, the respondents all patronized one healthcare provider or the other across the spectrum of healthcare providers available to them. Specifically, 90.9% patronized modern health-



care facilities (of which 37.0% utilized government health facilities and 53.9% utilized private health facilities).

**Table 2: Percentage distribution of women of advanced reproductive age by health seeking behavior indicators**

Characteristics	N	(%)
Health providers patronized		
Government health centres	206	37.0
Private health centres	300	53.9
Alternative/traditional centres	35	6.3
Both government and traditional	16	2.9
Total	557	100
Antenatal for current/last pregnancy		
Yes	463	91.1
No	45	8.9
Total	508	100
Age of pregnancy at first antenatal visit		
Two months	231	42.3
Three months	182	33.3
Four months	64	11.7
Five months	44	8.1
Six months and above	25	4.6
Total	546	100
Number of antenatal visits		
Once	12	2.2
Twice	44	8.1
Thrice	46	8.5
Four time	57	10.5
Five times and above	384	70.7
Total	543	100
Adherence to antenatal instructions		
Regularly	496	92
Whenever I remember	24	4.5
Once in a while	19	3.5
Total	539	100
Place of delivery of last pregnancy		
My home	33	6.0
Traditional birth home	59	10.7
Government health centre	319	57.9
Private health centre	140	25.4
Total	551	100



Characteristics	N	(%)
Delivery officer of your last child		
Medical doctor	181	33.0
Nurse	228	41.6
Midwife	77	14.1
Traditional birth attendant	49	8.9
Others	13	2.4
Total	548	100

*Note: Differences in total frequencies is due to non-response*

Table 2 reveals a relatively high utilisation of ANC in the study population. About 91.1% of respondents reported the utilisation of ANC for last/current pregnancy. Regarding the timing of the first ANC visit, majority of the women of ARA began ANC within twelve weeks of pregnancy (75.6%), which falls within the first trimester of pregnancy. The table also revealed that the majority of respondent (70.7%) received more than five ANC visits for their pregnancies.

In addition, from the table, it is glaring that a vast majority of women of ARA (92%) adhered greatly to instructions given them during ANC visits. Furthermore, 57.9% of the respondents gave birth to their last baby in a government health facility, sequel to this, 88.7% of respondents had their last pregnancy delivered by skilled health workers.

Tables 3 and 4 present the bivariate and multivariate analyses. Table 3 presents the association between selected socio-demographic indicators and utilization of MHCS in the study sample. The chi-square values are presented at the base of each panel of the table. The test was conducted at the significance level of 0.05.

Several socio-demographic factors were found to be significantly associated with MHCS indicators. Religious affiliation, religiosity and partner's educational level were found to be associated with receiving ANC for current/last pregnancy ( $p < 0.01$ ). Also, of all the eleven socio-demographic factors cross-tabulated, only religious affliction and parity were not significantly associated with timing of first ANC visit. The other nine socio-demographic factors (maternal age, marital status, ethnicity, religiosity, level of education, spousal level of education, employment status, income level and area of residence) ( $p < 0.05$ ) were significantly associated with the timing of the first ANC visit.

However, ethnicity, religious affiliation, educational status of women of ARA and their partners, employment status, income level, and area of residence were found to be significantly associated with delivery taken by health professionals ( $p < 0.05$ ). The analysis revealed that maternal age and marital status ( $p < 0.01$ ) were associated with the timing of their first ANC visit ( $p < 0.01$ ) as majority of the married women (77.9%) and 75.6% of the respondents had their first ANC visit within twelve weeks of pregnancy.

**Table 3: Percentage distribution of women of advanced reproductive age by selected socio-demographic factors and maternal healthcare services indicators**

Characteristics	Received ANC	Age of pregnancy at first ANC visit	Delivery taken by health professionals
Age	Yes (%)	Within 12 weeks (%)	Modern (%)
30-34	94.3(83)	67.3 (72)	86.8 (92)
35-39	91.2(208)	82.2 (199)	90.3(214)
40-44	90.8 (118)	76.3 (103)	87.3 (124)
45-49	87.1(54)	62.9 (39)	88.9 (56)
X <sup>2</sup> ; p-value	2.381; 0.497	15.246; 0.002	1.256; 0.740
Marital status			
Never married	66.7 (4)	16.7 (1)	100.0 (6)
Married	91.1 (390)	77.9 (364)	89.4 (420)
Divorced	90.5(19)	71.4 (15)	95.2 (20)
Widowed	100.0 (24)	60.9 (14)	84.0 (21)
Separated	92.9(13)	61.5 (8)	69.2 (9)
X <sup>2</sup> ; p-value	6.932; 0.140	17.086; 0.002	7.450; 0.114
Ethnicity			
Hausa	100.0 (24)	84.6 (22)	92.0 (23)
Igbo	88.8(71)	64.9 (61)	94.7 (90)
Yoruba	91.1 (346)	78.4 (316)	86.4 (349)
Others	94.1(16)	62.5 (10)	100.0 (17)
X <sup>2</sup> ; p-value	3.110; 0.375	10.260 ; 0.016	7.938; 0.047
Religious affiliation			
Christianity	89.4 (270)	73.4 (245)	90.0 (307)
Islam	96.4 (185)	79.4 (162)	91.8 (178)
Traditional	53.8 (7)	85.7 (6)	7.7 (1)
X <sup>2</sup> ; p-value	29.934; 0.000	2.914; 0.223	87.424; 0.000
Religiosity			
Less frequently	65.7(23)	67.3 (37)	89.5 (51)
Frequently	91.4(54)	58.5 (38)	82.6 (57)
More frequently	94.0(78)	71.6 (63)	90.9 (70)
Most frequently	93.0 (306)	81.2 (272)	89.2 (305)
X <sup>2</sup> ; p-value	30.117; 0.000	18.816; 0.000	3.021; 0.388
Educational status			
Primary	91.7 (253)	82.2 (236)	84.6 (259)
Secondary	92.7 (102)	61.2 (74)	91.5 (108)
Tertiary	88.2 (105)	74.1 (100)	95.9 (116)
X <sup>2</sup> ; p-value	1.671; 0.434	20.637; 0.000	12.099; 0.002
Spousal educational status			
No formal	66.7 (6)	88.9 (8)	87.5 (7)
Primary	76.5 (13)	66.7 (10)	87.5 (14)
Secondary	90.9 (170)	85.1 (160)	83.9 (167)
Tertiary	92.5 (259)	70.8 (226)	92.6 (287)

Characteristics	Received ANC	Age of pregnancy at first ANC visit	Delivery taken by health professionals
X <sup>2</sup> ; p-value	11.503; 0.009	14.761; 0.002	9.443; 0.024
Employment status			
Unemployed	93.3 (194)	74.6 (176)	85.8 (212)
Self-employed	89.5 (188)	81.5 (167)	88.5 (185)
Employee	92.5 (62)	62.8 (49)	97.1 (67)
X <sup>2</sup> ; p-value	1.993; 0.369	10.838; 0.004	6.679; 0.035
Income level			
Below 30,000	90.6 (173)	70.3 (137)	82.2 (166)
40,000-90,000	92.7 (127)	82.2 (129)	93.1 (148)
Above 100,000	97.4 (37)	89.1 (41)	93.3 (42)
X <sup>2</sup> ; p-value	2.121; 0.346	11.237; 0.004	11.290; 0.004
Number of children			
0-2	92.5 (135)	72.9 (121)	88.9 (144)
3-4	92.1 (267)	76.9 (240)	89.2 (280)
5 and above	85.9 (55)	78.7 (48)	84.6 (55)
X <sup>2</sup> ; p-value	2.806; 0.246	1.258; 0.533	1.130; 0.568
Area of residence			
Rural	95.2 (59)	41.3 (26)	73.0 (46)
Urban	90.6 (404)	80.1 (387)	90.7 (440)
X <sup>2</sup> ; p-value	1.413; 0.235	45.662; 0.000	17.421; 0.000

*Note: Only affirmative responses are shown in the table to avoid a very complex table*

In addition, Table 3 revealed a significant relationship between religious affiliation and certain MHCS indicators. 91.1% of the respondents received ANC for their last/current pregnancy ( $p < 0.001$ ) and 88.7% reported delivery of their last pregnancy by modern healthcare professionals ( $p < 0.001$ ). Also, ethnicity was related to the timing of their first ANC visit ( $p < 0.05$ ) with 75.9% of respondents across the ethnic groups having their first ANC visit within the first twelve weeks of pregnancy. The table also showed that religiosity was significant with receiving ANC for last/current pregnancy ( $p < 0.001$ ), as majority (91.1%) of the respondents received ANC for last/current pregnancy. Also, 75.5% of respondents received their first ANC visit within twelve weeks of pregnancy ( $p < 0.001$ ).

Furthermore, majority of the respondents across all levels of education (75.5%) received ANC within twelve weeks of pregnancy ( $p < 0.001$ ) and 88.6% had their delivery taken by modern healthcare professionals ( $p < 0.01$ ). Also, a significant association was found between the level of spousal education and all indices of MHCS measured. A vast majority of the respondents irrespective of their spousal's educational status received ANC for current pregnancy and (end the sentence) 76.1% had their first ANC within twelve weeks of pregnancy ( $p < 0.01$ ) and 89.1% had their last delivery by modern healthcare professionals ( $p < 0.05$ ).

Table 3 further revealed an association between employment status, timing of first ANC visit ( $p < 0.01$ ) and delivery by modern healthcare professionals ( $p < 0.05$ ). As 75.5% of respondents, irrespective of their employment status, received ANC within twelve weeks of pregnancy and 88.4% had their delivery taken by modern healthcare professionals. Similarly, from the table, income level was also found to be associated with timing of first ANC visit and delivery by modern healthcare professionals ( $p < 0.01$ ). 77.1% of respondents, regardless of level of income, received ANC within twelve weeks of pregnancy and 87.7% had their delivery taken by modern healthcare professionals.

Finally, from Table 3, a large majority (80.1%) of respondents in urban areas and just 41.3% of residents in rural areas received first ANC within twelve weeks of pregnancy and majority (90.7%) of re-spondents in urban area and (73.0%) in rural area had delivery by modern healthcare professionals respectively ( $p < 0.001$ ).

The findings revealed in Table 3 give an impression that the socio-demographic characteristics of women of ARA are enabling factors that encourage good HSB via the utilization of MHCS.

Table 4 shows the odds ratio of logistic regression on the association between socioeconomic factors and utilization of MHCS by women of ARA. The models suggest that age, ethnicity, religious affiliation, religiosity, educational qualification, spouse educational qualification, and place of residence significantly predicted the utilization of MHCS ( $p < 0.05$ ). Specifically, the model implies there is an inverse relationship between maternal age and timing of first ANC visit. The older women get, the less likely they are to start ANC within twelve weeks of pregnancy ( $p < 0.01$ ).

**Table 4: Odds ratios of logistic regression on the influence of socio-economic factors on indicators of MHCS among women of ARA in Lagos State**

Characteristics	Received ANC for current pregnancy	Age of pregnancy at first ANC Visit	Adherence to medical instruction	Delivery personnel
Age	0.99(0.90-1.09)	0.91 (0.85-0.96)**	0.97 (0.89-1.06)	0.99 (0.91-1.07)
Ethnic group				
Hausa	3.67 (0.42-31.8)	0.48 (0.19-1.22)	0.69 (0.15-3.18)	2.03 (0.44-9.28)
Igbo	1.11 (0.40-3.09)	0.42 (0.23-0.78)**	1.61 (0.59-4.35)	3.28 (1.03-10.47)*
Yoruba (r)	-	-	-	-
Religious affiliation				
Islam	3.71 (1.28-10.67)*	1.20 (0.68-2.11)	-	1.25 (0.58-2.70)
Traditional	0.136 (0.04-0.51)**	0.983 (0.10-9.93)	-	0.00 (0.00-)
Christianity(r)	-	-	-	-
Parity	0.69 (0.49-1.0)*	1.13 (0.88-1.45)	1.22(0.81-1.84)	1.13 (0.80-1.59)
Attendance of religious activities				
Less frequently	0.21(0.67-077)*	0.56 (0.25-1.27)	0.15 (0.05-0.39)***	0.75 (0.21-2.61)
Frequently	0.58(0.17-1.98)	0.24 (1.12-0.49)***	0.21(0.08-0.59)**	0.29 (0.12-0.70)**

Characteristics	Received ANC for current pregnancy	Age of pregnancy at first ANC Visit	Adherence to medical instruction	Delivery personnel
More frequently	0.73(0.23-2.28)	0.59 (0.30-1.16)	0.84 (0.24-2.90)	1.27 (0.80-1.59)
Most frequently(r)	-	-	-	-
Educational qualification				
Basic education	1.77 (0.52-6.05)	1.19 (0.56-2.57)	0.95(0.30-3.00)	0.55 (0.17-1.80)
Secondary education	2.37 (0.65-8.63)	0.45 (0.23-0.89)*	1.85 (0.59-5.85)	0.48 (0.14-1.60)
Tertiary education (r)	-	-	-	-
Spouse's educational qualification				
No formal education	0.19 (0.27-1.36)	1.43 (0.15-13.32)	0.03 (0.01-0.22)***	0.25 (0.03-2.55)
Basic education	0.19(0.34-1.1)	1.52 (0.33-6.94)	0.30 (0.05-1.80)	0.33 (0.06-1.84)
Secondary education	0.80 (0.28-2.27)	1.34 (0.68-2.62)	1.11 (0.38-3.29)	0.56 (0.24-1.29)
Tertiary education (r)	-	-	-	-
Employment status				
Unemployed	0.94 (0.24-3.69)	1.58 (0.78-3.18)	1.52 (0.53-4.39)	0.26 (0.5-1.31)
Self-employed	0.70(0.22-2.81)	1.47 (0.72-3.01)	2.51 (0.76-8.27)	0.34 (0.65-0.55)
Employed (r)				
Area of residence				
Rural	0.97(0.26-3.62)	0.09 (0.04-0.18)***	4.09 (0.50-33.17)	0.24 (0.11-0.55)**
Urban (r)	-	-		-
Model chi-square	48.04***	99.21***	52.75***	90.75***

\*Significant at  $P<0.05$ ; \*\*Significant at  $P<0.01$ ; \*\*\*Significant at  $P<0.001$

Women of the Igbo ethnic group were also found to be less likely than Yoruba women to start ANC within twelve weeks of pregnancy ( $p<0.01$ ) and were three times more likely to be delivered by modern health professionals ( $p<0.05$ ) than their counterpart in of other ethnic affiliation. In addition, the odds ratio indicates that respondents who identified as Muslim were three and half times more likely to have received ANC for current pregnancy ( $p<0.05$ ).

Furthermore, the table reveals that respondents who attend religious activities less frequently were less likely to receive ANC for current pregnancy ( $p<0.05$ ) and adhere to medical instructions received during ANC ( $p<0.001$ ). Those who attend frequently are less likely to receive ANC within twelve weeks of pregnancy ( $p<0.001$ ) and are less likely to adhere to medical instructions during pregnancy and delivered by modern health professionals ( $p<0.01$ ).

Also, the odds ratio suggests that there is an inverse relationship between parity and utilisation of ANC. The more children a woman has,, the less likely she is to receive ANC for current pregnancy ( $p<0.05$ ). Women with secondary school education were also

found less likely to receive ANC within twelve weeks of pregnancy ( $p < 0.05$ ). Whereas, respondents whose partner has no formal education were also less likely to adhere to medical instruction given during ANC visits ( $p < 0.001$ ).

Finally, the odds ratio also indicates that respondents in the rural areas were less likely to begin ANC within twelve weeks of pregnancy ( $p < 0.001$ ) and be delivered by modern health personnel ( $p < 0.01$ ).

## DISCUSSION

The bivariate and multivariate analyses addressed the study hypothesis “Socio-demographic factors are likely to influence utilization of MHCS by women of advanced reproductive age.” The bivariate analysis identified the specific socio-demographic factors that were associated with specific MHCS indicators, while the multivariate expanded on the exact direction of the relationship socio-demographic factors had on the utilization of MHCS by women of ARA in Lagos State.

The analysis observed that women of ARA in the study settings exhibited good and proper utilization of MHCS, which is consistent with earlier findings documented in literature about women of ARA. Older reproductive-aged women were identified to seek more of MHCS during pregnancy (Agbaje et al., 2016; Fitzpatrick et al., 2016; Agunwa et al., 2017; Oni & Fagbeminiyi, 2017). This finding contradicts the results of Adhikari (2016) and Mugo et al. (2015) who reported in their studies that increasing maternal age was negatively associated with the utilisation of MHCS in Nepal and Sudan, respectively. Proper utilization of MHCS by women of ARA found in the study could be attributed to their awareness of the risks associated with pregnancy, especially at ARA. This echoes the assertion that knowledge of pregnancy risk factors predicts the utilisation of MHCS (Kifle et al., 2017).

Specifically, the data revealed that women of ARA patronized MHCS available to them, which includes government-owned healthcare facilities, privately owned healthcare facilities and traditional birth attendants (TBAs). This observation agrees with the findings of Agunwa et al. (2017) who reported that maternal age influences the utilisation of MHCS. However, the results contradict that of earlier studies in sub-Saharan Africa that reported that increasing maternal age was negatively associated with the utilisation of MHCS (Dahiru & Oche 2015; Wilunda et al., 2015; Adhikari, 2016). This contradiction could be attributed to the educational status of respondents, availability, and accessibility of MHCS to women of ARA in the study setting. Also, the study established that women of ARA are consistent in their choice of healthcare provider, which suggests that the choice of a maternal healthcare provider is not an arbitrary one for women of ARA. This contradicts pieces of evidence in the literature that women of repro-



ductive age patronized multiple healthcare providers for pregnancy issues (Akeju et al., 2016; Shrestha et al., 2017).

Moreover, the data analysis revealed that majority of the respondents received ANC in healthcare facilities for their last pregnancy. This finding corroborated existing literature that women of ARA in Nigeria, booked for and received ANC in healthcare facilities (Opadiran et al., 2018). Regarding the timing of their first ANC visit, our data revealed that women of ARA had their first ANC visit before the twelfth week of pregnancy as recommended by WHO. This finding corroborates reports of Opadiran et al. (2018), Teshale & Tesema (2020) and Solanke et al. (2022), which indicated that across countries in sub-Saharan Africa's women of ARA booked earlier for ANC than younger mothers. The study also revealed that they were also found to adhere to instructions given to them by healthcare providers. This finding is consistent with existing literature (Agunwa et al., 2017; Ediris et al., 2018). This is assumed to be birthed out of concern for their pregnancy at such late reproductive age. These findings contradict that of Adhikari et al. (2016) who reported that most reproductive-aged women do not book early for ANC until the second trimester.

Conversely, the multivariate analysis revealed a negative significant relationship between increasing maternal age and the timing of their first ANC visit (more than twelve weeks of pregnancy), which contradicts the submission of Teshale and Tesema (2020). This could be attributed to shame on the part of multiparous ARA mothers for getting pregnant again at such an advanced age, while the primiparous ARA mothers report early for ANC consultations and guidance. The timing of the first ANC is also important and necessary for mitigating adverse pregnancy outcomes (WHO, 2023), as late booking prevents early detection of danger signs and complications during pregnancy (Ameh et al., 2016).

In a similar vein, women of ARA were found to have more than five ANC visits for preceding pregnancies, which isn't surprising as early commencement of ANC will definitely result in more than five ANC appointments before delivery. This contradicts Eluwa et al. (2018), who reported that most reproductive-aged women in Nigeria attend less than four ANC visits during their pregnancy. This finding suggests that women of ARA were regular and consistent with their ANC appointments.

Not surprisingly, the findings of this study revealed that women of ARA had institutional-based delivery. These findings are supported by literature that utilisation of more ANC visits by women of ARA translates to institutional based delivery (Tsawa et al., 2015; Oni & Fagbeminiyi, 2017).

The study found that a number of sociocultural factors strongly predicted the HSB of women of ARA via the utilization of MHCS. The level of maternal education was found to be associated with the timing of their first ANC visit (within twelve weeks of preg-



nancy) and delivery by modern health professionals. Specifically, women with just secondary education were less likely to initiate ANC early compared to those with tertiary education. This finding is corroborated by existing literature; that maternal level of education is a significant predictor of women's HSB (Ibebuike et al., 2021; Solanke et al., 2022). This finding strengthens the assertion that a woman's level of education improves MHCS utilisation and HSB by enhancing her level of health awareness, and access to more information about MHCS (Udeh et al., 2015; Agbaje et al., 2016).

In addition, the level of education of women of ARA's partners was also found to be a predictor of all the indices of MHCS examined in the study. This is consistent with earlier findings which argue that partners' level of education is often a more important determinant of HSB than women's education, especially where the husband is the chief decision maker (Agho et al., 2016; Okonofua et al., 2018). In particular, women of ARA whose partner's educational level is above basic education had better HSB. It is expected that educated spouses ascribe higher value to the health and welfare of their wives, and appreciate the benefits embedded in seeking MHCS. Linked to this is the finding that marital status was a predictor of HSB among women of ARA specifically with the timing of first ANC visit. Women in sub-Saharan Africa are expected to obey their husband in all things. Thus, if a husband doesn't approve the use of MHCS, the spouse will be re-restricted to her husband's decision. Women's decision-making power is limited in sub-Saharan African, especially in matters of education, finance and reproduction, owing to patriarchy (Lassi et al., 2016; Kea et al., 2018).

Significantly, the data analysis further revealed that income level and employment status predicted the utilization of MHCS among the study population. These factors are directly related to the timing of their first ANC visit and delivery handled by professionals. This is reinforced by the existing literature (Agunwa et al., 2017; Ntoimo et al., 2018). These studies established that unemployed and low-income earners are less likely to have sufficient resources to cater for their needs and be able to afford the extra cost of accessing MHCS.

Moreso, area of residence also predicted HSB. Women of ARA resident in urban areas were found to have initiated ANC visits earlier and had more of their delivery taken by modern health professionals than their counterparts in rural areas. This finding is supported by existing literature (Agho et al., 2016; Ameh et al., 2016). Women, resident in rural areas, mostly had difficulties in accessing MHCS due to its location. Parity was also reported as a predictor of women of ARA MHCS utilization. The data revealed attendance of ANC reduced with parity. This finding echoes the stance of earlier studies that established usage of MHCS reduces with parity. This is exclusively prominent among multiparous women who believed in their experience of pregnancies and childbirths (Lassi et al., 2016).

In addition, religious affiliation and level of religiosity were also found to be significant predictor of utilization of MHCS by women of ARA. These findings second that of Kifle et al. (2017) and Oni and Fagbeminiyi (2017) who established in their respective studies among countries of sub-Saharan Africa, religious beliefs as a predictor of HSB and it contradicts the results of Al-Mujtaba et al. (2016) who found no meaningful religious influence on HSB of reproductive aged women in sub-Saharan countries.

MHCS utilization of women of ARA from this study reflects the level of susceptibility and severity they adjudged their conditions. Women of ARA did not take chances when it came to maternal issues but rather did all within their capacity to ensure an uneventful pregnancy and safe delivery. These perceived threats were enough to spur them to a timely and prompt HSB via the utilisation of MHCS, after carefully weighing the cost and effect of their actions and inactions. This finding is in line with the tenets of HBM, which hold that the combination of levels of susceptibility and severity provides the force to act, and the perceived benefits provide a path of action.

It is necessary for further studies on women of ARA in other populations to get a broader spectrum on HSB of women of ARA and its implication for maternal health outcomes within the country. Such studies may be designed to adopt a cross-sectional approach and medical history to allow for more in-depth understanding of the bearing of HSB on maternal health outcomes of ARA. In addition, it will be highly rewarding to study the trend of pregnancies at ARA within the country, a dimension that the present study did not address. Likewise, well-designed studies should be carried out describing the exact predictors of late motherhood in Nigeria.

## CONCLUSION

This study illuminated more on the relationship between increasing maternal age and HSB. The study establishes that ARA translates to better utilisation of MHCS. The study also identified the significant predictors of women of ARA's HSB, which were maternal age, marital status, ethnicity, religious affiliations, religiosity, literacy, spousal level of education, employment status, level of income, and area of residence.

Policy actions that ensure all women of reproductive age across the country are encouraged to enhance their health by imbibing health habits and take preconception counselling when preparing for pregnancy should be set in motion. Emphasis on the utilisation of MHCS for pregnancies at ARA should be inculcated into such actions. Finally, education, a key agent in better utilisation of MHCS, necessitates the promotion of sound reproductive health education addressing various aspects of reproductive health with special attention on the precariousness and management of pregnancy at ARA for favourable outcomes. A way of doing this is to undertake programs to educate the general populace on reproductive health matters while bearing in mind the diversity of the

nation. Thus, policymakers should engage community leaders and religious groups to get these programs across the board

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