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Utilization of Maternal Health Care Services and Factors Associated with Adequate Antenatal Care among Pregnant Women in Ilorin East Local Government Area, Kwara State, Nigeria

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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Abstract

Introduction: Maternal mortality in Nigeria represents a high percentage of the total number of maternal deaths worldwide. The attainment of SDG 3.1, which aims to reduce the maternal mortality rate below 70 deaths per 100,000 live births by 2030, remains a critical target. Inequality in MHC utilization is still an issue

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in Nigeria, and the Kwara State government has prioritized maternal health interventions. Ilorin East LGA, a semi-urban area comprising diverse socio-economic statuses, provides a setting to examine the determinants of MHC utilization.

Aim: The study aims to determine the level of utilization of MHC services and their associated factors among pregnant women in Ilorin East LGA, Kwara State, Nigeria.

Methodology: This is a descriptive cross-sectional survey carried out among 272 pregnant women in Ilorin East LGA, utilizing a multistage sampling technique. Data were collected using a pre-tested interviewer-administered questionnaire and analyzed using SPSS software. Descriptive statistics and Chi-square were employed with a significance level of $P < 0.05$

Results: The mean age of respondents was 31.8 ± 7.5 years. The majority were aged 26-35 years (55.88%), Yoruba ethnic group (85.66%), Muslim religion (73.16%), married (87.87%), and self-employed (71.32%). Low income was found among more than a third (30.15%) of respondents, and a tertiary education level among only one-fifth (21.69%). In addition, the majority gave birth in health facilities (87.87%), and nearly all followed nurse health education (95.96%). About nine-tenths of the participants indicated that their culture permits MHC use (92.65%), but slightly more than one-tenth prefer TBA (11.40%). Hospital expenses considerations came before MHC use in two-thirds of cases (66.18%). Chi-square test revealed education (χ^2=18.67, p<0.001), income (χ^2=12.91, p=0.005), and occupation (χ^2=9.38, p=0.025) as significant predictors of adequate MHC utilization, but not age and parity.

Conclusion: While there was high utilization of MHC services, sociodemographic factors such as education, income, and occupation significantly affected adequate ANC utilization. Low levels of education, income, and unemployment were negatively related to adequacy of ANCs utilization. Expanding health insurance coverage and subsidizing ANC usage among socioeconomically deprived women are suggested as effective measures in enhancing adequate utilization and achieving SDG 3.1.

Keywords: Maternal healthcare; service utilization; socioeconomic determinants; Ilorin East; Nigeria; SDG 3.1.

1. Introduction

Maternal health care (MHC), comprising antenatal care (ANC), skilled birth attendance (SBA), and postnatal care (PNC), is a key factor in decreasing maternal and infant illness and mortality rates. According to World Health Organization (WHO), about 287,000 women died due to complications related to pregnancy in 2023 worldwide, indicating a maternal mortality ratio (MMR) of 197 per 100,000 live births (World Health Organization, 2025). In addition, 2.3 million infants died, while another 1.9 million babies experienced stillbirths in 2022 globally, but many of these cases could have been prevented through the timely provision of quality MHC services (United Nations Inter-agency Group for Child Mortality Estimation, 2024). However, despite considerable advancements, the statistics do not reflect the SDG Targets 3.1 and 3.2, which set out to cut the global MMR below 70 per 100,000 live births and eliminate preventable death cases among newborns and young children by 2030 (United Nations, 2023). The burden of maternal and infant mortality is especially high in Nigeria, as the country registered an MMR of 1,047 per 100,000 live births in 2020, representing 29% of maternal deaths worldwide (World Health Organization, 2025). Nigeria also recorded the highest absolute number of neonatal deaths in the world in 2022, approximated at 277,000, with a neonatal mortality rate of 36 deaths per 1,000 live births (United Nations Inter-agency Group for Child Mortality Estimation, 2024). Within Nigeria, there is inadequate service utilization: according to the Nigeria Demographic and Health Survey (NDHS) done between 2023 and 2024, the number of women who completed four or more ANC visits stood at 66%, 57% delivered at a health institution, while 56% undertook postpartum visitation within two days after delivery (National Population Commission & ICF, 2024). Infant mortality rates have been placed at 68 per 1,000 live births, while under-five mortality rates are at 111 per 1,000 live births (National Population Commission & ICF, 2024). These gaps also lead to preventable morbidity such as hemorrhage, hypertensive disorders, infection, sepsis, asphyxia during childbirth, and infections (World Health Organization, 2025).

Maternal health inequalities are caused by differences in access to health care services and their quality, which may be influenced by socio-economic status, education, place of residence, and cultural values (World Health Organization, 2025). In Nigeria, some of the most important factors include poverty, long distances to health care facilities, lack of education, low perceptions of the quality of services, gender relations, and trust in traditional birth attendants (Fagbamigbe et al., 2021). These issues result not only in increased mortality but also

in morbidities, which cause additional burdens on society at large and have socio-economic implications for health systems. This is apparent in Kwara State. Although MMR data specific to states is hard to come by, the government has noted maternal and child mortality as an area of concern and is undertaking interventions to tackle the issue (Punch, 2024). Ilorin East LGA in Kwara State of Nigeria is comprised of a diverse populace, both religiously and culturally, but reports show that most women do not attend antenatal care (ANC), give birth at home, and use unskilled delivery attendants despite the availability of PHCs. All of these are factors that disrupt the continuity of care and increase the likelihood of obstructed childbirth, infections, eclampsia, neonatal infections, and even neonatal deaths. Hence, there is a need to understand the determinants of the utilization of MHCs within this context. This study focuses on the Ilorin East LGA, which serves as an appropriate model for an urban-rural mixed area where traditional and contemporary variables play a role in influencing maternal healthcare utilization. It is necessary to appreciate the peculiarities of the area in terms of its demographics and culture in order to be able to comprehend the issues surrounding maternal healthcare utilization. Individual, communal, and systemic factors should be identified based on evidence for effective resource utilization and health education efforts (World Health Organization, 2025).

In the case of Ilorin East Local Government Area, where there is little empirical data available, such information becomes vital for optimizing the provision of primary health care services, minimizing out-of-pocket spending, and promoting equity. By enhancing MHC utilization, Nigeria can fulfill its promises made under SDGs 3.1, 3.2, and 5.6. Thus, the current study seeks to examine the use of MHC services and the factors that influence their use among pregnant women living in Ilorin East LGA, Kwara State. The study will seek to determine the extent of use of MHC services; the effect of socio-demographic characteristics on the use of MHC services; the link between cultural and social factors and the use of MHC services; and the barriers faced by pregnant women during the use of MHC services in Ilorin East LGA. It is assumed that there is no association between socio-demographic characteristics and the use of MHC services among pregnant women in Ilorin East LGA.

2. Review of Literature

2.1 Theoretical Framework

The basis of this research lies within the Health Belief Model (HBM), a model that uses perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action, and self-efficacy to explain health behaviors. As per the HBM, a pregnant woman's intention to seek maternal healthcare services (MHS) depends on their perceived risk of developing complications, the severity of those conditions, the benefits of antenatal and maternity care, and various other barriers like costs, proximity, and cultural factors. Cues to action related to health education, mass media, community mobilization, and self-efficacy affect utilization of MHS as well. Studies applying HBM in Nigeria have shown that perceived benefits and perceived susceptibility significantly influence early commencement of ANC and facility delivery among pregnant women.

2.1.1 Utilization of Maternal Health Care Services in Nigeria

Maternal health care services comprise antenatal care (ANC), delivery by skilled birth attendants, emergency obstetric care, and postpartum care. Timely use of MHS can reduce up to 75% of maternal mortality rates (World Health Organization, 2016). Unfortunately, utilization remains suboptimal in Nigeria. For example, according to the results of the 2013 NDHS survey, 60.9% of respondents had ANC visits with skilled personnel, 51.0% visited the clinic at least four times, and 36% delivered their baby in a healthcare facility (National Population Commission & ICF International, 2014; Fagbamigbe & Idemudia, 2021). Recent statistics show that although 74% of respondents visit ANC clinics, only 41% deliver babies in the facilities and 21% undergo postnatal care consultations (Adedokun et al., 2023). National-level statistics indicate that 67% of women receive ≥4 ANC visits in 2023-2024, while only 49% have facility deliveries (National Population Commission & ICF, 2024).

2.1.2 Social-demographic and Economic Determinants

The determinants of MHS utilization include education, income, age, parity, and occupation. The women educated at the secondary level and above have greater chances of accessing skilled deliveries (Fasiku et al., 2018; Gabrysch & Campbell, 2009). Rich families can afford costs, hence they have higher utilization rates (Ononokpono & Odimegwu, 2014). On the contrary, residence in rural areas limits MHS utilization due to

distance and lack of proper facilities (Wang et al., 2011). Occupation gives women independence in terms of finances, which enhances their decision-making power (Qayyum & Arshad, 2021). Young women and those with lower parity tend to utilize MHS because of their awareness of health messages (Tsegay et al., 2013; Ochako et al., 2011).

2.1.3 Knowledge, Perception, and Quality of Services

Knowledge and perception directly influence utilization. Women with high maternal health service knowledge are three times more likely to seek skilled delivery (Fagbamigbe & Idemudia, 2021). Yet in Kwara State, only 46% of women had correct ANC knowledge and under 40% could identify danger signs. Perceived poor service quality—unfriendly staff, long waits, unofficial fees, and lack of privacy—also hinders ANC use even when services are free (Kujawski et al., 2015). In Nigeria, client-perceived respect and communication during ANC predicted ≥4 visits and facility delivery. Distance remains critical; women >5 km from facilities in North-Central Nigeria were significantly less likely to use skilled delivery, especially rurally (Okedo-Alex et al., 2019). Thus, knowledge deficits, negative perceptions, and geographic barriers jointly reduce MHS utilization despite improved access policies.

2.2 Conceptual Framework

Using the HBM model, the conceptual framework is presented as follows:

Independent Variables are susceptibility to complications, severity of pregnancy-related risks, benefits of MHS, access barriers, cues to action, and socio-demographic characteristics such as age, educational attainment, economic status, parity, and occupation.

Dependent variables are maternal healthcare services utilization, which can be evaluated by ANC attendance, birth attended by skilled personnel, and postnatal care services.

Typically, a conceptual framework used in investigating maternal health services utilization usually identifies factors affecting utilization (ANC, delivery, PNC) using three levels, namely predisposing (education, age), enabling (income, distance, insurance), and need factors (health status). Andersen's behavioral model, which is mostly concerned with individual determinants and the interaction of predisposing factors and resources, is the most used concept in this case (National Population Commission, 2006) (See Fig. 1).

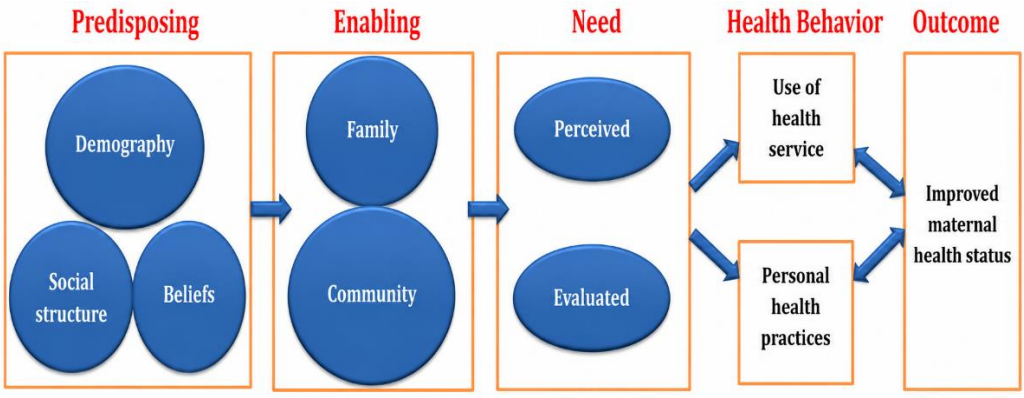


Fig. 1. Conceptual Framework of the Study Explaining Utilization of MHC Services Adapted from (Akhtar et al. 2022)

3. Material and Methods

3.1 Study Design and Setting

This study was a descriptive cross-sectional study, and it took place in Ilorin East Local Government Area (LGA), one of the sixteen LGAs in Kwara State, North-Central Nigeria. Established in 1991 as a result of

decentralization, Ilorin East LGA is part of the Ilorin metropolis in the Ilorin Emirate, with its administrative headquarters at Oke-Oyi. The LGA is located in Nigeria's savanna region, characterized by flat or gently rolling topography and a tropical climate with wet (April–October) and dry (November–March) seasons. These climatic conditions have supported subsistence and commercial agriculture, which is the major occupation of the area's inhabitants.

According to the 2006 National Population Census, Ilorin East has a population exceeding 200,000, with women in their reproductive ages (15-49 years) forming a substantial proportion within the area's population (National Population Commission, 2006). In recent times, there has been a noticeable increase in the number of inhabitants in Ilorin East as a result of urbanization and migration from neighboring rural areas. This growth has placed increased demand on existing healthcare services and created disparities in access and utilization of health services.

Ilorin East LGA consists mainly of Yorubas but has considerable numbers of Fulanis and Hausas, indicating a predominance of Islam, although there is a presence of Christian and indigenous religions as well. This social setting, which has been influenced by Islamic scholarship and Yoruba culture, has impacted health behaviors, gender relations, and family decision-making practices. Health service delivery involves both public and private institutions, such as Primary Health Centres, comprehensive health centers, and maternity clinics. In spite of this blend, the utilization of antenatal, skilled birth delivery, and postnatal care services is rather unevenly distributed, especially in rural and peri-urban settings. Educational attainment and literacy vary among different segments of the population, affecting their knowledge and use of maternal health care facilities. Close proximity to major institutions such as the University of Ilorin, Kwara State Polytechnic, and College of Nursing and Midwifery has also increased the level of health literacy of certain population groups.

3.2 Study Population and Sample Size Determination

The study population includes pregnant women who live in selected communities within Ilorin East Local Government Area and pregnant women attending antenatal clinics within selected public and private health institutions. These groups are the available population because they are accessible during the antenatal clinics' hours. The criteria that made individuals be included in the study include pregnant women aged 15-49 years who have been living within Ilorin East Local Government Area for at least six months, are willing to give their consent, and are available on the date of the survey. Criteria that exclude pregnant women from the study include being non-pregnant women aged 15-49 years who visit the area but do not reside within Ilorin East Local Government Area; having health complications that make them unable to participate; and women who refused consent or failed to attend on the date of the survey. The minimum sample size for this study was determined using Cochran's formula as follows:

$$n = Z^2pq /d^2$$

Where n is the minimum sample size if the population is greater than 10,000, Z is the standard normal deviate at 95% confidence level, which is 1.96, p is the estimated proportion of the population using maternal health care services, q = (1 – p), and d is the margin of error of 5%. According to a previous survey conducted among pregnant women, 77.6% of the respondents use MHC services, it was estimated that p = 0.776. So, the minimum sample size needed is 267. With the inclusion of 10% for non-response rate, the estimated sample size is 297. However, the actual number of questionnaires returned is 272, which corresponds to a response rate of 92.0%. Hence, the sample size utilized in the present study is 272.

3.3 Sampling Technique

The following is the multistage sampling method used in selecting 300 respondents within Ilorin East LGA, Kwara State:

Stage 1: Ward Selection

From the 12 political wards that constituted Ilorin East LGA, 6 wards were selected via simple random sampling using balloting. These wards include: Ibagun, Zango, Okelele, Gambari, Agbeyangi, and Maya/Ile-Apa.

Stage 2: Community Selection

From the 6 selected wards, 2 communities were randomly selected via simple random sampling for a total of 12 communities. The 300sample size was evenly allocated among the selected communities, where each community was allotted 25 respondents.

Stage 4: Household Selection

Systematic sampling was done on the basis of the estimation of households within each community. A sampling interval (k) was determined by dividing the number of households by 25 and then sampling the required number of respondents. A random starting point was selected, and every kth household was sampled until 25 households were obtained.

Stage 5: Respondent Selection

Within the selected households, one pregnant woman and/or a woman of reproductive age who had accessed maternal healthcare services was selected. In cases where there were several respondents, the process of simple random sampling was employed.

3.4 Instrument and Method of Data Collection

Data were collected using a pretested, validated, structured, interviewer-administered questionnaire developed based on a literature review and adapted to the local context. The questionnaire included four sections: socio-demographic information, knowledge of maternal health services, utilization of antenatal care, delivery, and postnatal services, as well as perceived barriers and enabling factors. Content validity of the questionnaire was established through review by a public health expert and an obstetrician and Gynaecologist. The questionnaire was written in English and translated into Yoruba, which is the local language of the majority of the population, for ease of administration. The completed questionnaires were back-translated into English for analysis. A pretest of the instrument was carried out among 30 pregnant women (representing 10% of the projected sample size) in Malete, Moro Local Government, Kwara State, and the reliability of the knowledge component was measured using Cronbach's alpha, which was found to be 0.81. The goal of the pretest was to evaluate the structure, accuracy, language clarity, respondent comprehension, and ease of administration of the instrument. The responses and feedback obtained during the pretest phase informed necessary adjustments to refine the questionnaire and eliminate ambiguities. The pretested questionnaire was analyzed, and necessary corrections were made before it was used for the main study.

The data collection was carried out by six trained research assistants, who were each assigned to cover two communities for the conduct of face-to-face interviews with the respondents. Before data collection began, each respondent was briefed on the purpose, scope, and voluntary nature of the study. The data collection lasted for a period of four weeks from February to March 2026, with each research assistant taking about 15-20 minutes to complete the filling of the questionnaire for one respondent.

3.5 Analysis of Data

The data was entered, cleaned, and analyzed with IBM SPSS Statistics software version 26. Data were presented using frequency distribution tables and charts. Descriptive statistics such as frequency distributions and measures of central tendency were used to summarize the data. Chi-square test of independence was performed to examine the relationships between categorical variables. Binary logistic regression analysis was conducted to identify predictors of adequate utilization of MHC services. Both crude and adjusted odds ratios with 95% confidence intervals were calculated. A P-value of < 0.05 was considered statistically significant.

Adequate antenatal care (ANC) for this study entailed at least four visits to health-care professionals during pregnancy, with the first visit in the first trimester, as advocated in the WHO's Focused Antenatal Care model. While the WHO updated its recommendation to eight contacts in 2016 for enhanced maternal and perinatal health, the definition of adequate ANC was kept at four visits in this study for the following reasons:

1. Nigeria National ANC Policy Guidelines:

The current guidelines of the National Program on Essential Reproductive Health Services for Nigeria and the recent Nigeria Demographic and Health Survey of 2023/24 still use ≥4 visits as the criterion for adequate ANC coverage.

2. Implementation situation: The majority of the primary health care facilities in Kwara State still follow the FANC schedule, and the 8-contacts model had not been scaled up by 2026.

3. Comparison: Adopting ≥4 ANC visits ensures comparability with other Nigerian studies and surveys (World Health Organization, 2016; NPC & ICF International, 2014; Fagbamigbe & Idemudia, 2021). ANC with <4 visits and late first visit (>first trimester)

4. Results

4.1 Socio-demographic Characteristics of Respondents

More than half of the respondents (55.88%) fall within the age range of 26-35 years, with a mean age of 31.8 ± 7.5 years. The main tribe of respondents (85.66%) was the Yoruba tribe, while the main religion (73.16%) was Islam. Almost all of the respondents were married (87.87%), about three-quarters are multigravida (71.32%), and almost three-quarters are self-employed (71.32%). More than half (53.68%) of the respondents' income level was average, and less than one-third (30.15%) had low income. In regard to education, more than half of the respondents (51.47%) had a secondary education level, and almost one-quarter (23.16%) had only a primary level, while a small minority (3.68%) had no formal education. Only about one-fifth (21.69%) of the respondents attained tertiary education, as shown in Table 1 below:

Table 1. Socio-demographic Characteristics of Respondents, Feb–Mar 2026 (N=272)`

Variables	Frequency	Percentage
Age		
15-25	48	17.65
26-35	152	55.88
36_49	72	26.47
*Mean ± SD	31.8 ± 7.5 years	
Tribe		
Hausa	13	4.78
Yoruba	233	85.66
Igbo	25	9.19
Others	1	0.37
Religion		
Christianity	65	23.9
Islam	199	73.16
Traditional	5	1.84
Others	3	1.10
Income		
Low income	82	30.15
Average Income	146	53.68
Good Income	34	12.50
High Income	5	1.84
Undisclosed	5	1.84
Marital Status		
Single	22	8.09
Married	239	87.87
Other (Divorced, separated, deceased spouse)	11	4.04
Occupation		
Employed	49	18.01

Variables	Frequency	Percentage
Self-employed	194	71.32
Unemployed	15	5.51
Others	14	5.15
Education		
Tertiary	59	21.69
Secondary	140	51.47
Primary	63	23.16
None	10	3.68
Parity		
(a) Primigravida	60	22.06
(b) Multigravida	194	71.32
(c) Grand multigravida	18	6.62

**Mean and SD were estimated from grouped data using class midpoints 20, 30.5, and 42.5 years*

4.2 Level of Utilization of MHC Services

Table 2 showed that utilization of MHC was generally high as majority (87.87%) delivered their previous child(ren) at a healthcare facility, and nearly all (95.96%) followed health education from nurses. For ANC, about two-thirds (62.87%) of respondents had 5 contacts, about one-fifth (19.85%) had 4 contacts, and nevertheless, a small minority had only 1 contact (3.31%) or none, (1.10%). Despite high facility delivery, a small proportion (4.41%) delivered at home or elsewhere, (7.72%).

Table 2. Level of Utilization of MHC services

N = 272

Variables	Frequency	Percentage
Is this your first pregnancy?		
Yes	80	29.41
No	190	69.85
Nil	2	0.74
How many antenatal contact have you had during this pregnancy or previous pregnancy?		
0	3	1.10
1	9	3.31
2	11	4.04
3	24	8.82
4	54	19.85
5	171	62.87
Where did you have the delivery of your previous child(ren)		
Healthcare facility	239	87.87
Home	12	4.41
Others	21	7.72
Do you follow Health Education given to you by Nurses at the healthcare facility during this pregnancy or previous pregnancy(ies)		
(a) Yes	261	95.96
(b) No	7	2.57
(c) Partially	4	1.47

Many (87.87%) of the respondents in this study delivered their previous children in healthcare facilities, indicating a strong uptake of skilled birth attendance. And in a show of persistent gaps for some women, a small proportion (4.41%) delivered at home or in other settings (7.72%) as shown in Fig. 2.

4.3 Cultural Factors Affecting Utilization of MHC Services

Table 3 showed that cultural support was strong in the study area as over nine-tenths (92.65%) reported their culture permits MHC use. However, close to half (43.75%) rejected MHC as taboo, and did not prefer

traditional personnel (46.32%). Over one-third strongly disagreeing, 98 (36.03%), yet about one-tenth (11.40%) agreed with the preference. A small minority strongly agreed (6.25%), indicating traditional birth attendants remain influential for some women (Fig. 3).

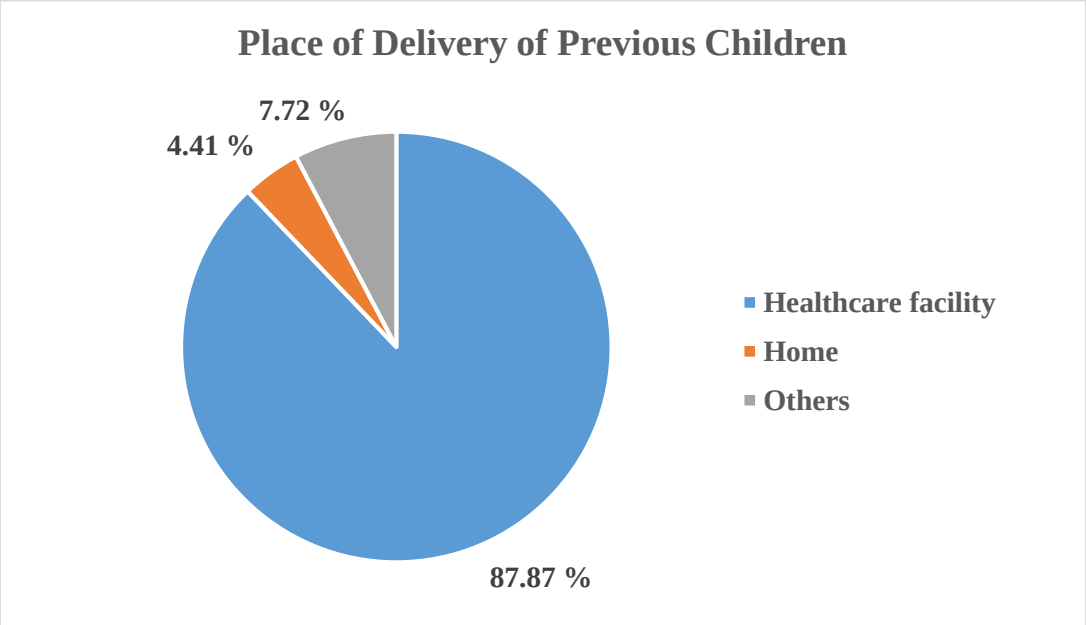


Fig. 2. Place of Delivery of Previous Children by Respondents

Table 3. Cultural Factors Affecting Utilization of MHC services

N = 272

Variables	Frequency	Percentage
Does your culture permit you to use maternal healthcare services?		
(a) Yes	252	92.65
(b) No	12	4.41
(c) Don't know	8	2.94
Do you prefer traditional personnel for maternity over Doctors / Nurses		
(a) Agree	31	11.4
(b) Strongly Agree	17	6.25
(c) Neutral	0.00	0.00
(d) Disagree	126	46.32
(e) Strongly Disagree	98	36.03
Do you consider maternal healthcare services provided at the healthcare facility as a taboo?		
(a) Agree	33	12.13
(b) Strongly Agree	9	3.31
(c) Neutral	2	0.74
(d) Disagree	119	43.75
(e) Strongly Disagree	109	40.07

4.4 Factors Influencing the Utilization of MHC Services

Cost and quality were key drivers for the utilization of MHC services in this study area. As shown in Table 4, two-thirds (66.18%) of the respondents agreed they consider hospital bills before using MHC, while over one-fifth (21.32%) strongly agreed with that consideration. Nearly one-third (30.15%) strongly agreed that bills discourage utilization, and one-quarter (25.74%) strongly agreed that provider attitude mattered, with nearly half

(46.69%) agreeing it determines continued use of MHC services. Hospital bill expenses were burdensome to many subjects in this research with 66.18% reporting this as an important determinant while 21.32% agreed strongly with the issue (Fig. 4).

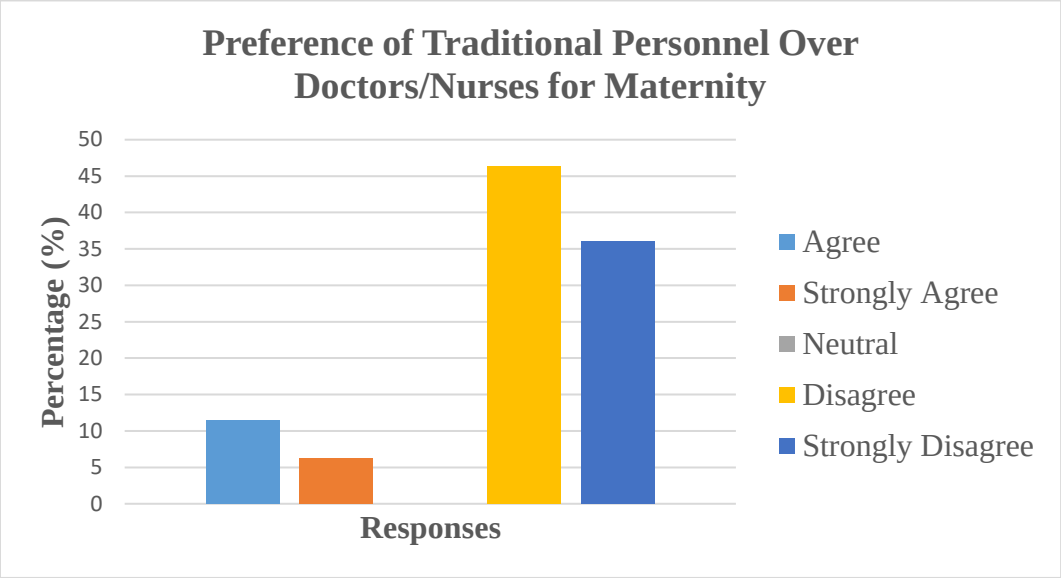


Fig. 3. Preference of traditional personnel over doctors/nurses for maternity

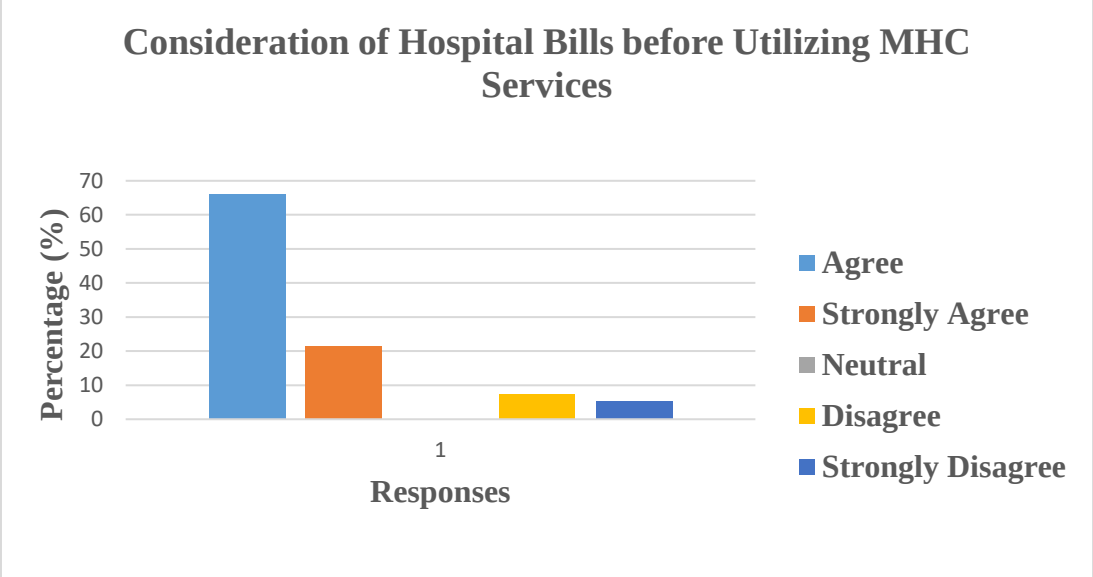


Fig. 4. Consideration of Hospital Bills Before Utilizing MHC services by Respondents

4.5 Association between sociodemographic characteristics and adequate antenatal care (≥4 visits) among pregnant women in Ilorin East LGA, 2026 (N=272)

As shown in Table 5, bivariate analysis revealed that educational status, income level, and occupation are significant determinants of adequacy of ANC use, while age and parity are not. There is a statistically significant relationship between adequate ANC and the respondents' educational level, as more women with tertiary education reported adequate ANC than those with lower educational levels; specifically, the percentage of women with adequate ANC with tertiary education (93.22%) was greater than that of secondary education (85.71%), primary education (73.02%), and no formal education (40.00%) ($\chi^2 = 18.67$, $P < 0.001$). There is a

positive correlation between the variables, as the education level increases, the percentage with adequate ANC increases. Income level is also significantly associated with ANC adequacy ($\chi^2 = 12.91$, $P = 0.005$).

Table 4. Factors Influencing the Utilization of MHC services

N = 272

Variables	Frequency	Percentage
Do you consider hospital bills before utilizing Maternal Healthcare Services?		
(a) Agree	180	66.18
(b) Strongly Agree	58	21.32
(c) Neutral	0	0.00
(d) Disagree	20	7.35
(e) Strongly Disagree	14	5.15
Do hospital bills discourage you from utilization of healthcare service?		
(a) Agree	60	22.06
(b) Strongly Agree	82	30.15
(c) Neutral	0	0.00
(d) Disagree	110	40.44
(e) Strongly Disagree	20	7.35
Do behaviours / attitudes of Doctors / Nurses determine if you will continue utilization of MHC services?		
(a) Agree	127	46.69
(b) Strongly Agree	70	25.74
(c) Neutral	0	0.00
(d) Disagree	43	15.81
(e) Strongly Disagree	32	11.76
Do hospital infrastructures /facilities such as sitting space, reception etc. interests you to utilize MHC services.		
(a) Agree	169	62.13
(b) Strongly Agree	34	12.5
(c) Neutral	0	0.00
(d) Disagree	49	18.01
(e) Strongly Disagree	20	7.35
Do mode of transportation affect your utilization of maternal Healthcare services		
(a) Yes	137	50.37
(b) No	135	49.63
Do you consider the quality of care at healthcare facility before utilization?		
((a) Agree	180	66.18
(b) Strongly Agree	58	21.32
(c) Neutral	0	0.00
(d) Disagree	20	7.35
(e) Strongly Disagree	14	5.15

The variable occupation also exhibited a statistically significant relationship with adequate ANC use ($\chi^2 = 9.38$, $P = 0.025$). The highest percentage of adequate ANC users among employed women was 89.80%, while among self-employed women it was 83.51%. On the other hand, fewer than six out of ten unemployed women had adequate ANC (53.33%), which suggests that unemployment negatively affects the use of ANC. The variable age was not statistically significantly related to ANC adequacy ($\chi^2 = 2.84$, $P = 0.241$). However, women between the ages of 26-35 years had a very high percentage of adequate ANC (86.18%). Similarly, parity was not significantly associated with ANC adequacy ($\chi^2 = 1.52$, $P = 0.468$). However, primigravida had the highest percentage of adequate ANC (86.67%), while grand multigravida had the lowest percentage (72.22%).

5. Discussion

More than half of respondents (55.88%) were aged 26–35 years, reflecting the peak reproductive age group in Nigeria (National Population Commission & ICF, 2024). The predominance of Yoruba ethnicity (85.66%) and

Islam (73.16%) is consistent with the demographic profile of Ilorin East LGA (National Population Commission, 2006). That almost all were married (87.87%) and about three-quarters were multigravida (71.32%) aligns with findings by Fagbamigbe et al. (2021), who noted that marital status and prior pregnancy experience increase MHC exposure. However, nearly one-third reported low income (30.15%), and only about one-fifth attained tertiary education (21.69%). Similar clustering of low education and poverty has been linked to reduced health-seeking behavior in North-Central Nigeria (Mohammed et al., 2023). The high proportion of self-employment (71.32%) mirrors Kwara State's informal economy (Punch, 2024) but may limit time and financial flexibility for ANC, as observed by Okedo-Alex et al. (2019).

Table 5. Association between sociodemographic characteristics and adequacy of ANC utilization (N = 272)

Sociodemographic variable	Adequate ANC ≥4, n (%)	Inadequate ANC <4, n (%)	Total, N (%)	χ^2	p-value
Age				2.84	0.241
15-25	37 (77.08)	11 (22.92)	48 (17.65)		
26-35	131 (86.18)	21 (13.82)	152 (55.88)		
36-49	57 (79.17)	15 (20.83)	72 (26.47)		
Education				18.67	<0.001*
None	4 (40.00)	6 (60.00)	10 (3.68)		
Primary	46 (73.02)	17 (26.98)	63 (23.16)		
Secondary	120 (85.71)	20 (14.29)	140 (51.47)		
Tertiary	55 (93.22)	4 (6.78)	59 (21.69)		
Income				12.91	0.005*
Low income	60 (73.17)	22 (26.83)	82 (30.15)		
Average Income	124 (84.93)	22 (15.07)	146 (53.68)		
Good/High Income	36 (92.31)	3 (7.69)	39 (14.34)		
Occupation				9.38	0.025*
Employed	44 (89.80)	5 (10.20)	49 (18.01)		
Self-employed	162 (83.51)	32 (16.49)	194 (71.32)		
Unemployed	8 (53.33)	7 (46.67)	15 (5.51)		
Others	11 (78.57)	3 (21.43)	14 (5.15)		
Parity				1.52	0.468
Primigravida	52 (86.67)	8 (13.33)	60 (22.06)		
Multigravida	160 (82.47)	34 (17.53)	194 (71.32)		
Grand multigravida	13 (72.22)	5 (27.78)	18 (6.62)		

**Significant at $p < 0.05$; χ^2 = Chi-square; Good and High-income categories merged due to small cell counts*

This study revealed that the utilization of MHC services was generally high as a large majority delivered previous children at a healthcare facility (87.87%), and nearly all followed health education from nurses (95.96%). For ANC, about two-thirds had 5 contacts (62.87%) and about one-fifth had 4 contacts (19.85%), meaning most met WHO's minimum of four contacts (World Health Organization, 2016). This exceeds the national average of 67% for ≥4 ANC visits (National Population Commission & ICF, 2024), likely due to recent state-level health system strengthening (Punch, 2024). Nonetheless, a small minority had only 1 contact (3.31%) or none (1.10%), a gap smaller than that reported in rural Southwest Nigeria (Bolarinwa et al., 2021), probably because Ilorin East is semi-urban. High compliance with health education supports the WHO's emphasis on counseling to improve retention in care (World Health Organization, 2025).

Health facility delivery was reported by a large majority (87.87%), higher than the national rate of 49% and the North-Central average of 62% (National Population Commission & ICF, 2024). This advantage likely reflects better facility density and ongoing primary healthcare investments in Kwara (Punch, 2024). Still, a small proportion delivered at home (4.41%) or elsewhere (7.72%), consistent with Oluwole et al. (2024) review that 5–10% of Nigerian women deliver outside facilities due to sudden labor or cost. The persistence of non-facility births despite high ANC suggests a disconnect between ANC and birth preparedness, also documented by Yaya et al. (2023), where transport and nighttime labor were key barriers.

Cultural support for utilizing MHC was strong, as over nine-tenths reported their culture permits MHC use (92.65%). But some still consider MHC as taboo, with close to half disagreeing (43.75%) and over one-third strongly disagreeing (40.07%) with using MHC services. This is contrary to findings of earlier studies in Northern Nigeria, where cultural prohibition was a major barrier (Fagbamigbe et al., 2021). Nevertheless, just over one-tenth agreed MHC is taboo (12.13%), and a small minority strongly agreed (3.31%), indicating residual resistance similar to findings by Al-Mujtaba et al. (2021) in Ilorin. Ilorin's status as a religious and educational center may explain more liberal interpretations of Islamic teachings on health-seeking compared to more conservative northern states.

In this study, most respondents did not prefer traditional personnel, with nearly half disagreeing (46.32%) and over one-third strongly disagreeing (36.03%) with a preference for TBAs. Yet about one-tenth agreed (11.40%) and a small minority strongly agreed (6.25%). The overall rejection of TBAs exceeds national estimates, likely due to better facility access in Ilorin East (Punch, 2024). However, the residual preference mirrors Oluwole et al. (2024), who attributed TBA patronage to perceived empathy and flexibility. In this study, nearly half agreed that provider attitude determines continued use (46.69%), suggesting that perceived harshness of nurses, documented by Ishola et al. (2021), may sustain TBA reliance.

Cost and quality were key drivers influencing the Utilization of MHC Services. Two-thirds agreed they consider hospital bills before using MHC (66.18%), and over one-fifth strongly agreed (21.32%). Nearly one-third strongly agreed that bills discourage utilization (30.15%), corroborating Fagbamigbe et al. (2021) on user fees as a top barrier. The high cost sensitivity likely reflects that nearly one-third had low income (30.15%), and out-of-pocket payments remain dominant in Nigeria (United Nations, 2023). The attitude of providers played an important role; almost half of the respondents indicated that it was responsible for their continued usage (46.69%), and one-quarter strongly agreed (25.74%) with the WHO criteria for appropriate provider attitudes (World Health Organization, 2025).

Respondents were of the opinion that hospital bills were a major consideration, with two-thirds agreeing (66.18%) and over one-fifth strongly agreeing (21.32%) that they consider costs. However, this percentage is higher compared to the 54% noted by Bolarinwa et al. (2021) because of possible inflation and out-of-pocket expenses between 2021 and now. This trend is exacerbated by the high percentage of self-employment among respondents (71.32%), who mostly do not have health insurance and paid leaves. Similarly, Fagbamigbe & Idemudia, 2021) found cost-based ANC deferral among 61.7% of mothers in the poorest wealth quintile, compared to 8.0% among mothers in the wealthiest quintile.

As per the association between sociodemographic characteristics and adequacy of ANC Utilization, this study found that education, income, and occupation were significantly associated with adequate ANC (≥4 contacts), while age and parity were not. The proportion with adequate ANC rose from (40.00%) among women with no education to (93.22%) among those with tertiary education ($p < 0.001$). This gradient supports Okedo-Alex et al. (2019), who showed that each additional education level raises ANC odds, likely via improved health literacy and autonomy. Income showed a similar trend: (92.31%) of good/high-income women versus (73.17%) of low-income women had adequate ANC ($p = 0.005$), mirroring NDHS data on wealth-related disparities (National Population Commission & ICF, 2024). Employed women had the highest adequacy (89.80%) while less than six-tenths of unemployed women did (53.33%) ($p = 0.025$), suggesting employment enables ANC through income and autonomy (Yaya et al., 2023). The non-significance of age and parity contrasts with Fagbamigbe et al. (2021) but agrees with Akhtar et al. (2022), indicating that in semi-urban areas, socioeconomic factors now outweigh demographics, possibly due to widespread media health campaigns.

6. Study Limitations and Suggestions for Further Studies

This study has some limitations. The use of a cross-sectional design limits causal inference between sociodemographic factors and ANC utilization. Data were self-reported, which may introduce recall or social desirability bias, especially for sensitive issues like cultural taboos or preference for traditional birth attendants. The study was conducted in one LGA in Kwara State, which restricts generalizability to other regions with different cultural or health system contexts. Additionally, qualitative insights into why some women still prefer TBAs or deliver outside facilities despite high ANC attendance were not captured. To reduce social desirability and recall bias, trained female data collectors were used as research assistants; the study ensured the use of clear, simple questions and reference periods (e.g., "in your current pregnancy"); emphasis was laid on

anonymity during data collection; and respondents were assured of confidentiality to encourage honest responses. Additionally, the use of neutral wording was ensured, and self-administration of the questionnaire by the participants was encouraged where possible. Questionnaires were pre-tested and translated into Yoruba to ensure comprehension. Facility registers were reviewed, where possible, to validate reported ANC visits and place of delivery.

Future research should adopt mixed-methods designs to explore the socio-cultural and behavioral reasons for non-facility delivery among women who attend ANC. Longitudinal studies are needed to establish temporal relationships between socioeconomic changes and MHC utilization. Comparative studies across rural and urban LGAs in Kwara State would clarify geographic disparities. Further work should also evaluate the impact of ongoing health insurance schemes and respectful maternity care interventions on ANC adequacy and facility delivery rates.

7. Conclusion and Recommendations

This study assessed the level of utilization of maternal healthcare services and associated factors among women of reproductive age in Ilorin East LGA. Findings show that utilization of MHC services was generally high, with a large majority reporting facility delivery and adequate ANC. Socio-demographic analysis revealed that most respondents were married, self-employed Yoruba Muslims aged 26–35 years, yet nearly one-third had low income and only about one-fifth attained tertiary education. Cultural support for MHC was strong, though a minority still considered MHC as a taboo, or preferred traditional birth attendants. The factors that had an effect on utilization include hospital expenses, provider demeanor, and quality of care, as almost two-thirds agreed that expenses are taken into account when seeking MHC services. A significant relationship existed between education level, economic status, and profession and adequate ANC, but not between age and number of births. On the whole, socioeconomic empowerment became the dominant facilitator for adequate ANC, whereas poor education, poverty, and unemployment were the most notable barriers to ANC.

There is a need to address cost and education-related challenges to improve utilization of MHC services in Ilorin East LGA through strategic interventions. First, the government of Kwara State and other health officials should increase access to health insurance schemes among the less privileged members of the population, especially by providing subsidized and free ANC services for the poor and jobless women. Second, there is a need for enhanced health education within the communities to emphasize the importance of ANC among illiterate and literate women, who have only attained the primary education level. Third, hospitals should strengthen their respectful maternity care by offering training programs and feedback mechanisms because caregiver behavior determines uptake. Fourth, incentives should be put in place to ensure skilled attendants during birth by addressing transport challenges, for instance, through the development of community transport systems for women in labor. Fifth, women in the informal sector should benefit from economic empowerment activities to enhance their economic status.

Consent

It is not applicable.

Ethical Approval

The permission to carry out this study was granted by the Ethical Review Committee of the Kwara State Ministry of Health under permission number ERC/MOH/2026/02/599. There was no use of force or coercion on the part of the researcher in order to ensure that the pregnant women participated in the study. Written Informed consent was obtained from all eligible pregnant woman before participation. Participants were informed that their participation is voluntary and that they may withdraw at any time without any consequences.

Disclaimer (Artificial Intelligence)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc.) and text-to-image generators have been used during the writing or editing of this manuscript.

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Competing Interests

Authors have declared that they have no known competing financial interests or non-financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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