

Evaluating Knowledge and Attitude of Pregnant Women Towards Antenatal Care Services in Primary Healthcare Centre, Sauka Abuja, Nigeria

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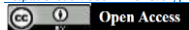
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ABSTRACT

This study assessed the knowledge and attitude of pregnant women toward antenatal care (ANC) services at the Primary Healthcare Centre, Sauka, Abuja, Nigeria. The study adopted a descriptive cross-sectional design and targeted pregnant women attending ANC services at the facility. A total of 487 questionnaires were distributed, out of which 456 were retrieved and analyzed, representing a response rate of 93.6%. Data were collected using a structured questionnaire and analyzed using descriptive and inferential statistics with Statistical Package for Social Sciences (SPSS) version 25. The findings revealed that respondents demonstrated moderate to high levels of knowledge regarding antenatal care services, including awareness of early booking, available services, and pregnancy-related risks. However, some gaps were identified in knowledge of the recommended number of visits and specific complications. The study also found that respondents generally exhibited positive attitudes toward ANC services, with many acknowledging the benefits of regular attendance and expressing trust in healthcare providers. Despite this, a proportion of respondents reported dissatisfaction with aspects of care, particularly in relation to comfort and respect during clinic visits. Furthermore, the study identified key factors influencing knowledge and attitude, including family support, cultural beliefs, financial constraints, and accessibility challenges. Family encouragement positively influenced ANC utilization, while economic and structural barriers limited consistent attendance. A positive relationship was established between knowledge and attitude, indicating that increased awareness was associated with more favorable perceptions and willingness to utilize services. The study concluded that while knowledge and attitudes toward antenatal care were generally positive, gaps and barriers still existed that could hinder optimal utilization. It was recommended that healthcare providers strengthen health education, improve service delivery, and address socio-economic barriers to enhance maternal health outcomes.

Introduction

Antenatal care (ANC) remains a cornerstone of maternal and child health, designed to ensure optimal outcomes for both the mother and the unborn child. The World Health Organization defines antenatal care as the care provided by skilled health professionals to pregnant women in order to ensure the best health conditions for both mother and baby during pregnancy (World Health Organization [WHO], 2022). ANC services encompass a broad range of interventions including health education, early detection of complications, nutritional support, immunization, and counseling on safe delivery practices.

Globally, maternal mortality remains a critical public health concern, particularly in low- and middle-income countries. According to the WHO (2023), approximately 95% of maternal deaths occur in developing regions, with sub-Saharan Africa accounting for a significant proportion. Nigeria contributes substantially to this burden due to multiple systemic and socio-cultural challenges affecting

maternal healthcare utilization. Despite improvements in healthcare infrastructure, the utilization of antenatal services remains inconsistent, especially at the primary healthcare level.

Knowledge of antenatal care services is a key determinant of maternal health-seeking behavior. Pregnant women who possess adequate knowledge about the importance, timing, and benefits of ANC are more likely to initiate early booking and maintain regular visits throughout pregnancy. Babalola et al. (2021) found that women with higher levels of education and awareness are significantly more likely to utilize ANC services effectively. Similarly, research by Fagbamigbe and Idemudia (2020) indicates that knowledge gaps contribute to delayed initiation of antenatal care, which increases the risk of complications.

In addition to knowledge, attitude plays a critical role in influencing antenatal care utilization. Attitude encompasses beliefs, perceptions, and feelings toward healthcare services, which can either facilitate or hinder service uptake. Okedo-Alex et al. (2020) emphasized that negative attitudes toward healthcare providers, including perceived poor quality of care, long waiting times, and lack of empathy, discourage women from attending antenatal clinics. Conversely, positive attitudes foster trust and encourage continuous engagement with healthcare services.

Socio-cultural factors also shape knowledge and attitudes toward antenatal care. In many Nigerian communities, traditional beliefs and practices continue to influence pregnancy-related behaviours. Studies by Adewuyi et al. (2022) and Doctor et al. (2021) highlight that reliance on traditional birth attendants and cultural misconceptions about pregnancy can limit the utilization of formal healthcare services. These beliefs often coexist with limited access to accurate health information, further compounding the problem.

Economic factors are equally significant in determining ANC utilization. Although antenatal services are often subsidized or free in primary healthcare centres, indirect costs such as transportation, time, and opportunity costs may deter women from accessing care. According to Eke et al. (2023), financial constraints remain a major barrier to maternal healthcare utilization in Nigeria, particularly among low-income households.

Furthermore, healthcare system factors such as availability of skilled personnel, quality of services, and accessibility of facilities influence antenatal care uptake. Research by Uzochukwu et al. (2020) demonstrates that inadequate staffing, poor infrastructure, and inconsistent service delivery negatively affect patient satisfaction and utilization rates. These systemic issues are more pronounced in primary healthcare centres, which often serve as the first point of contact for pregnant women.

Primary Healthcare Centres (PHCs) play a vital role in delivering antenatal care services, especially in semi-urban areas like Sauka, Abuja. PHCs are designed to provide accessible, affordable, and community-based healthcare services. However, their effectiveness depends on the level of awareness and perception among the target population. Studies by Ononokpono and Odimegwu (2021) suggest that improving community-level knowledge and attitudes toward ANC can significantly enhance service utilization.

Given these complexities, assessing the knowledge and attitude of pregnant women toward antenatal care services is essential for identifying gaps and informing targeted interventions. This study focuses on pregnant women attending the Primary Healthcare Centre in Sauka, Abuja, with the aim of contributing to improved maternal health outcomes through evidence-based recommendations.

Maternal health remains a pressing concern in Nigeria despite numerous interventions aimed at reducing maternal mortality and improving access to healthcare services. Antenatal care services are widely recognized as an effective strategy for preventing pregnancy-related complications and ensuring safe delivery. However, the utilization of these services remains suboptimal, particularly at the primary healthcare level.

Evidence from the Nigeria Demographic and Health Survey (NPC & ICF, 2022) indicates that a significant proportion of pregnant women either initiate antenatal care late or fail to complete the recommended number of visits. This trend undermines efforts to reduce maternal and neonatal mortality and highlights persistent gaps in maternal healthcare delivery.

One of the major factors contributing to low utilization of antenatal care services is inadequate knowledge among pregnant women. Many women lack sufficient understanding of the importance of early booking, regular visits, and the range of services provided during antenatal care. Studies by Fagbamigbe and Idemudia (2020) and Adewuyi et al. (2022) reveal that limited awareness significantly affects health-seeking behavior, leading to delayed or irregular attendance.

In addition to knowledge gaps, negative attitudes toward healthcare services further exacerbate the problem. Pregnant women may develop unfavorable perceptions due to previous experiences, cultural beliefs, or perceived poor quality of care. Okedo-Alex et al. (2020) report that factors such as long waiting times, inadequate communication from healthcare providers, and lack of privacy contribute to negative attitudes and reduced utilization.

In Sauka, Abuja, anecdotal observations suggest that some pregnant women continue to rely on traditional birth attendants or delay seeking formal healthcare services. This raises concerns about the level of awareness and perception of antenatal care services within the community. Such practices increase the risk of preventable complications and adverse pregnancy outcomes.

Despite the availability of antenatal services at the Primary Healthcare Centre in Sauka, there is limited empirical data on the knowledge and attitudes of pregnant women in this area. Without such data, it is difficult to design targeted interventions that address specific barriers to utilization.

Therefore, this study seeks to assess the knowledge and attitude of pregnant women toward antenatal care services in Primary Healthcare Centre, Sauka Abuja, in order to identify gaps and provide evidence-based recommendations for improving maternal health outcomes.

Objectives of the Study

The objective of this study was to assess the knowledge and attitude of pregnant women toward antenatal care services in Primary Healthcare Centre, Sauka Abuja Nigeria, while the Specific Objectives include:

1. To assess the level of knowledge of pregnant women regarding antenatal care services.
2. To examine the attitudes of pregnant women toward antenatal care services.
3. To identify factors influencing the knowledge and attitude of pregnant women toward antenatal care.
4. To determine the relationship between knowledge and attitude toward antenatal care services.

Methodology

The study was conducted at the Primary Healthcare Centre (PHC) in Sauka, Abuja, Nigeria. Sauka is a semi-urban district with a diverse population, predominantly comprising women of reproductive age. The PHC provided antenatal care, immunization, and basic maternal and child health services. It was selected due to its high volume of pregnant women attending ANC services, which allowed for comprehensive data collection and representation of the local maternal population.

The study employed a descriptive cross-sectional survey design. This design was appropriate because it allowed for the collection of data on knowledge, attitude, and influencing factors at a single point in time. The design enabled the assessment of the prevalence of knowledge and attitudes toward antenatal care and facilitated the identification of associations between variables without manipulating them.

The study population comprised pregnant women attending ANC at the PHC, Sauka. Inclusion criteria were:

- Women who were currently pregnant
- Women aged 18 years and above
- Women who provided informed consent to participate

Exclusion criteria included:

- Women who were critically ill or unable to communicate
- Women who declined participation

The sample size was determined using Yamane's formula (1967) for a finite population:

$$n = \frac{N}{1 + N(e)^2}$$

Where:

- n = sample size
- N = population size of pregnant women attending ANC (assumed 1,200)
- e = margin of error (0.05)

$$n = \frac{1200}{1 + 1200(0.05)^2} = 487$$

Thus, a total of 487 respondents were targeted for the study.

A systematic random sampling technique was used. Every 2nd pregnant woman who attended the ANC clinic and met the inclusion criteria was selected until the sample size was reached. This method ensured randomness while maintaining feasibility in a busy clinic environment.

Data were collected using a structured, self-administered questionnaire. The questionnaire was divided into two sections:

- Section A: Demographic Data – age, marital status, education level, occupation, parity
- Section B: Research Objectives – statements related to knowledge, attitude, influencing factors, and relationships between knowledge and attitude

A **4-point Likert scale** was used for Section B:

- Strongly Agree (SA) = 4
- Agree (A) = 3
- Disagree (D) = 2
- Strongly Disagree (SD) = 1

Validity and Reliability of the Instrument was determined thus;

- **Validity:** The questionnaire was reviewed by three maternal health experts to ensure content validity. A pilot study was conducted with 20 pregnant women at a nearby PHC to assess clarity and comprehension.
- **Reliability:** Cronbach's alpha was calculated to assess internal consistency. The reliability coefficient was 0.82, indicating good reliability for the instrument.

Data collection occurred over four weeks. Research assistants explained the purpose of the study, obtained informed consent, and administered questionnaires to eligible participants. Completed questionnaires were checked daily for completeness before analysis.

Data were analyzed using Statistical Package for Social Sciences (SPSS) version 25. Descriptive statistics (frequency and percentage) analyzed demographic characteristics, mean and standard deviation analysed knowledge, and attitudes.

Ethical approval was obtained from the Federal Capital healthcare Research Ethics Committee and permission was further obtained from the management of the Primary Healthcare Centre, Sauka, Abuja. Participation was voluntary, informed consent was obtained, and confidentiality of respondents' information was strictly maintained. Respondents were assured that data would be used solely for academic purposes.

Findings

A total of 487 questionnaires were distributed to pregnant women attending the Primary Healthcare Centre, Sauka. Out of these, 31 questionnaires were not returned, resulting in a response rate of 93.6% (456 respondents).

Analysis of Demographic Characteristics of Respondents

All respondents completed Section A, which captured **age, marital status, educational level, occupation, and parity**. The summary is presented in **Table 1** below.

Variable	Category	Frequency (f)	Percentage (%)
Age (years)	18–24	92	20.2
	25–31	173	37.9
	32–38	122	26.8
	39–45	69	15.1
Marital Status	Single	71	15.6
	Married	362	79.4
	Divorced	18	3.9
	Widowed	5	1.1
Educational Level	No formal education	38	8.3
	Primary	76	16.7
	Secondary	182	39.9
	Tertiary	160	35.1
Occupation	Housewife	154	33.8
	Trader	98	21.5
	Civil servant	114	25.0
	Student	44	9.6
	Other	46	10.1
Parity (number of children)	0	68	14.9
	1–2	202	44.3
	3–4	138	30.3
	5+	48	10.5

The majority of respondents (37.9%) were aged 25–31 years, indicating that most participants were in their prime reproductive age. Most respondents were married (79.4%), which aligns with expectations for ANC attendance in this setting. Regarding educational level, a substantial proportion had secondary (39.9%) or tertiary education (35.1%), suggesting a reasonable level of literacy among the study population. This could positively influence knowledge and attitudes toward antenatal care.

In terms of occupation, housewives constituted the largest group (33.8%), followed by civil servants (25%) and traders (21.5%). This distribution highlights the diversity in economic status and daily schedules, which may influence ANC attendance patterns. Also, Parity data showed that most respondents had 1–2 children (44.3%), indicating that while some women were first-time mothers, a significant number had prior pregnancy experience, which could shape their knowledge and attitude toward ANC services.

The demographic profile suggests a mostly young, married, and reasonably educated population, which is likely to affect both knowledge and utilization of antenatal care services.

Analysis of Research Objectives Statements

Objective one: To assess the level of knowledge of pregnant women regarding antenatal care services.

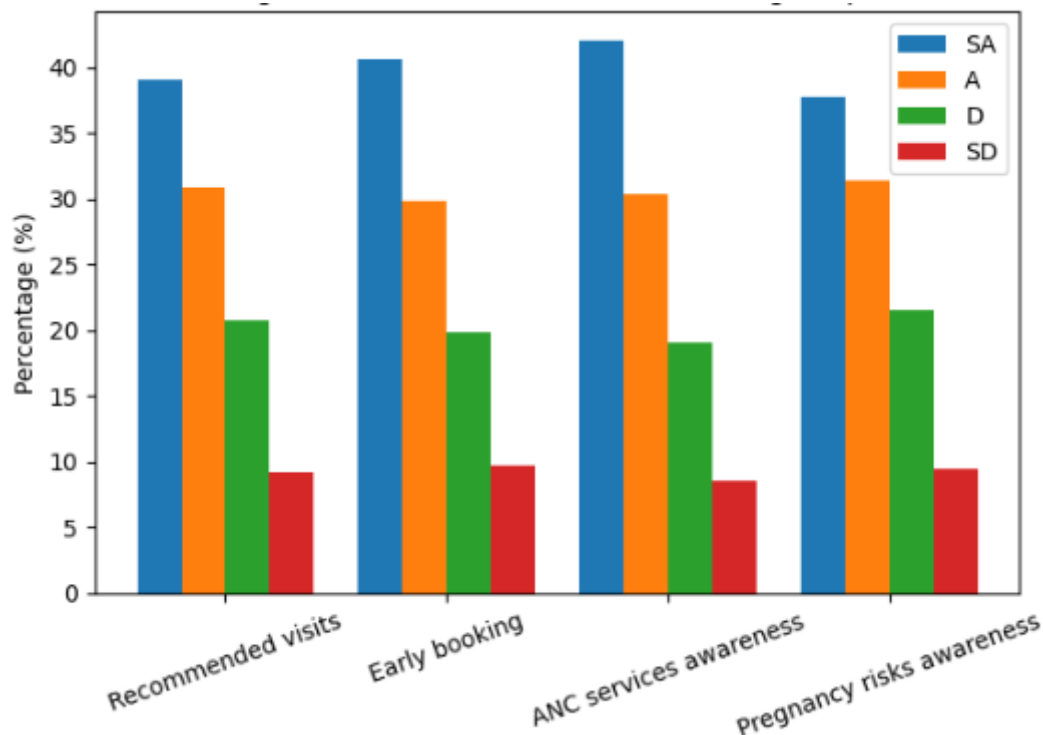


Figure 1: Assessment of Knowledge of ANC Services

Figure 1 shows that most respondents strongly agreed to having prior knowledge of ANC services (42.1%), followed closely by those who simply agreed (30.3%), indicating that most respondents had a clear understanding of what antenatal care entails, including services such as blood pressure monitoring and immunization. This high awareness is critical because it directly influences utilization and compliance with ANC schedules.

Secondly, the statement on *early booking* also showed strong knowledge levels, with 40.6% strongly agreeing and 29.8% agreeing. This indicates that a large proportion of respondents recognized the importance of initiating antenatal care early in pregnancy. Early booking is a key determinant of positive maternal and neonatal outcomes, so this finding reflects a favorable level of awareness among the study population. Similarly, knowledge of the *recommended number of antenatal visits* showed relatively strong agreement (39.0%) and 30.9% agreed. However, this item had a slightly higher proportion of disagreement (20.8%) compared to other items. This suggests that while general awareness exists, specific technical knowledge (such as WHO-recommended visit frequency) may not be fully understood by all respondents. However, *knowledge of pregnancy risks when ANC is not utilized* recorded the lowest strong agreement (37.7%) and the highest disagreement (21.5%) among the four items. This indicates that although many respondents were aware of risks, a significant proportion lacked detailed understanding of potential complications. This gap is important because awareness of risks often drives consistent healthcare-seeking behaviour.

Across all items, the proportion of respondents who selected “Strongly Disagree” remained below 10%, indicating that outright lack of knowledge was relatively minimal. However, the consistent presence of approximately 19–22% disagreement (D) across items highlights a moderate knowledge gap that cannot be ignored.

Objective two: To examine the attitudes of pregnant women towards antenatal care services.

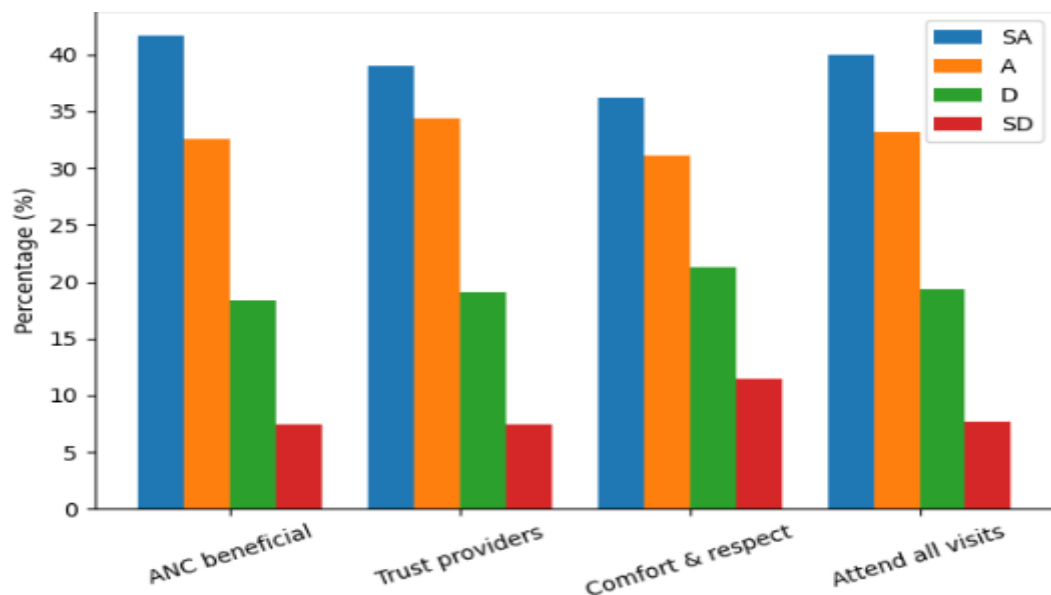


Figure 2: Examine Attitudes towards ANC Services

Figure 2 reveal that 41.7% of the respondents strongly agreed that attending ANC regularly was beneficial while 32.5% agreed, an indication that the majority of respondents recognized the importance of regular ANC attendance for both maternal and foetal health. The relatively low disagreement (18.4%) and strong disagreement (7.5%) further reinforced that belief in the benefits of ANC was widely accepted among participants. Also, while 39.0 % indicated that they strongly trust the healthcare providers, 34.4% similarly agreed suggesting that trust in healthcare professionals was relatively high, which is a crucial determinant of healthcare utilization. Trust often influences compliance with medical advice and continuity of care, making this finding particularly significant.

However, a different pattern was observed for the statement *“I felt comfortable and respected at the clinic.”* Although a majority still agreed (36.2% strongly agreed and 31.1% agreed), this item recorded the highest levels of disagreement (21.3%) and strong disagreement (11.4%) among all four statements. This indicated that a notable proportion of respondents experienced discomfort or perceived a lack of respectful treatment during clinic visits. This finding pointed to gaps in patient-centered care and interpersonal interactions within the healthcare setting.

Similarly, the statement *“I intended to attend all scheduled ANC visits”* showed strong positive responses (39.9% strongly agreed and 33.1% agreed), indicating a high level of commitment to continued ANC utilization. However, the presence of about 19.3% disagreement suggested that some respondents might face barriers that could hinder consistent attendance despite positive intentions.

Across all items, the proportion of strong disagreement remained relatively low (7.5%–11.4%), indicating that negative attitudes were not dominant but still present.

Objective three: To identify factors influencing the knowledge and attitude of pregnant women toward antenatal care.

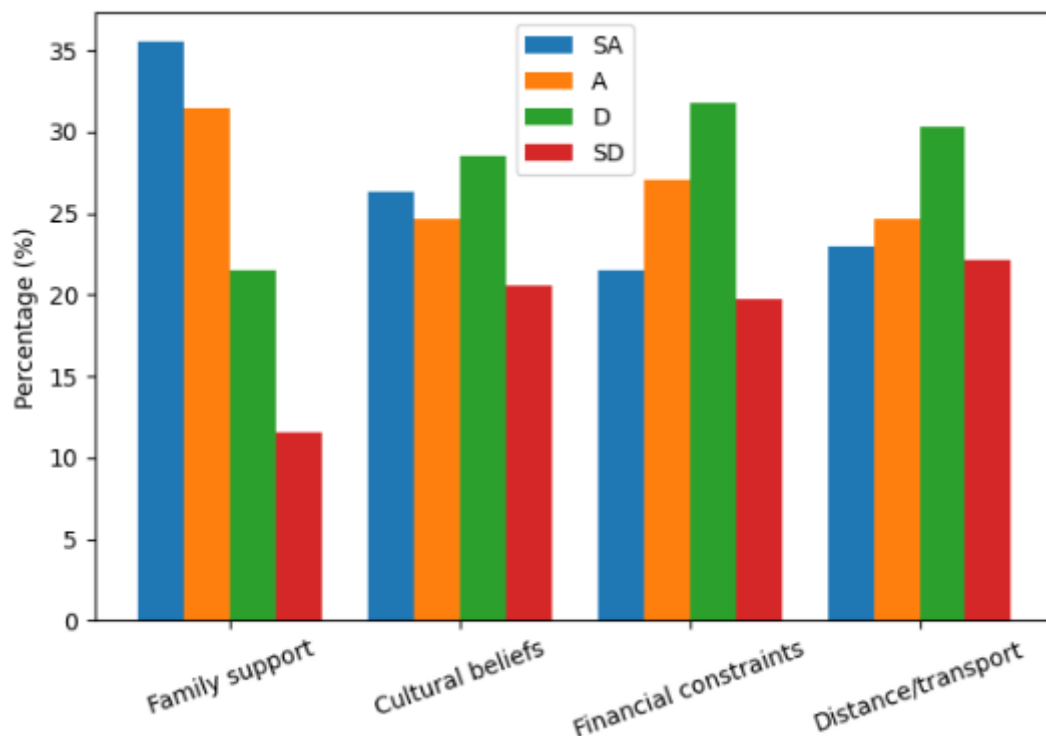


Figure 3: Identify Factors Influencing Knowledge and Attitude

Figure 3 show that family support emerged as the strongest positive influence on ANC utilization. A substantial proportion of respondents strongly agreed (35.5%) and agreed (31.4%) that their families encouraged them to attend antenatal care, indicating that social support systems, particularly from spouses and relatives, played a critical role in shaping health-seeking behaviours. The relatively lower disagreement (21.5%) and strong disagreement (11.6%) further reinforced that family influence was largely supportive. This finding suggests that interpersonal relationships and household dynamics significantly enhanced positive health behaviours. In contrast, cultural or traditional beliefs showed a more mixed distribution. While 26.3% strongly agreed and 24.6% agreed that cultural beliefs influenced their decisions, a higher proportion disagreed (28.5%) or strongly disagreed (20.6%). This indicates that cultural influence was not uniform across respondents. For some women, traditional beliefs played a significant role in decision-making, while others were less influenced by such factors. This variability highlights the context-dependent nature of cultural norms and their differing impacts on ANC utilization.

Regarding financial constraints, the chart showed that a considerable proportion of respondents experienced economic barriers. Although 21.5% strongly agreed and 27.0% agreed that financial challenges affected their attendance, a larger proportion disagreed (31.8%). This suggests that while not all respondents were financially constrained, a significant minority faced economic difficulties that could limit access to care. The presence of 19.7% strong disagreement indicated that some respondents did not perceive cost as a barrier, possibly due to free or subsidized services. However, the overall pattern still pointed to financial limitations as an important barrier for a segment of the population.

Similarly, distance and transportation challenges were identified as notable barriers. While 23.0% strongly agreed and 24.6% agreed that distance influenced their attendance, a higher proportion disagreed (30.3%) and strongly disagreed (22.1%). This indicated that accessibility issues affected some respondents but were not universally experienced. Nonetheless, for those affected, distance and transportation difficulties could significantly hinder consistent ANC attendance.

Across all four factors, the mean scores ranged from 2.46 to 2.97, indicating a moderate level of influence overall. Family support had the highest mean (2.97), confirming it as the most influential

positive factor, while financial constraints (2.46) and distance (2.47) had lower means, reflecting their role as moderate barriers.

Objective four: To determine the relationship between knowledge and attitude toward antenatal care services.

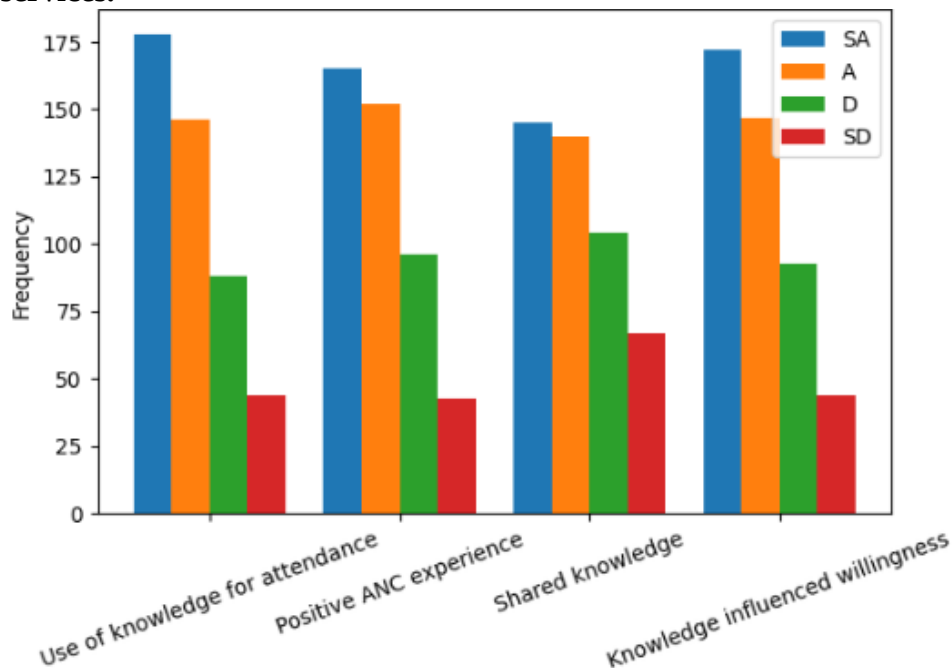


Figure 4: Relationship Between Knowledge and Attitude

Use of knowledge for attendance decisions: This recorded the highest proportion of *Strongly Agree* responses (178) and a substantial number of *Agree* responses (146). The relatively lower counts for *Disagree* (88) and *Strongly Disagree* (44) suggest that most respondents actively applied their knowledge when deciding to attend ANC. This reflects a strong practical impact of knowledge on behaviour.

Positive ANC experiences improved attitude: Responses were similarly distributed, with high agreement levels (165 SA, 152 A). This indicates that personal experiences at ANC facilities reinforced positive attitudes, suggesting that both knowledge and service quality play complementary roles in shaping perception and continued utilization.

Sharing ANC knowledge with others: This statement shows a slight decline in strong agreement (145 SA) and a noticeable increase in disagreement (104 D, 67 SD) compared to other items. While many respondents still shared knowledge, the higher disagreement suggests that knowledge dissemination within social networks is weaker, possibly due to cultural, social, or communication barriers.

Knowledge influenced willingness to utilize services: This item again reflects strong agreement (172 SA, 147 A), reinforcing the idea that knowledge is a key driver of willingness to engage with ANC services. The lower disagreement levels further support this conclusion.

Discussion of findings

The discussion of findings was organized in line with the four specific objectives of the study to ensure a systematic interpretation of results and alignment with existing empirical evidence and theoretical frameworks.

Objective 1: To assess the level of knowledge of pregnant women regarding antenatal care services

The findings of this study revealed that respondents generally demonstrated moderate to high levels of knowledge regarding antenatal care services. Most participants were aware of the importance

of early booking, the availability of services such as routine check-ups and immunization, and the potential risks associated with non-utilization of ANC. This finding was consistent with the study by Babalola et al. (2021), which reported that increased knowledge significantly improved early initiation and consistent attendance of antenatal care services.

However, despite this relatively high level of awareness, some knowledge gaps persisted, particularly regarding the recommended number of antenatal visits and specific pregnancy-related risks. This finding aligned with Fagbamigbe and Idemudia (2020), who observed that incomplete or inadequate knowledge often resulted in delayed booking and irregular attendance. The implication of this result was that while general awareness existed, depth and comprehensiveness of knowledge remained insufficient for optimal health-seeking behavior.

This outcome suggested that existing health education interventions might not have been fully effective in reaching all segments of the population or in delivering detailed and actionable information. It reinforced the need for continuous, targeted, and culturally appropriate health education programs to bridge these knowledge gaps and enhance informed decision-making among pregnant women.

Objective 2: To examine the attitudes of pregnant women toward antenatal care services

The study found that respondents exhibited generally positive attitudes toward antenatal care services, as reflected in their belief in the benefits of regular attendance and their intention to utilize ANC services. This finding was consistent with Adewuyi et al. (2022), who reported that positive perceptions of antenatal care significantly influenced utilization rates. Trust in healthcare providers and recognition of the benefits of ANC were identified as key drivers of these positive attitudes.

Nevertheless, the study also revealed that a proportion of respondents expressed negative experiences, particularly in relation to feeling uncomfortable or disrespected during clinic visits. This finding corroborated Okedo-Alex et al. (2020), who identified poor quality of care, long waiting times, and negative provider attitudes as significant barriers to ANC utilization. These negative perceptions could potentially discourage consistent attendance despite adequate knowledge.

The implication of this finding was that attitude was not solely determined by knowledge but was also influenced by service delivery experiences. Even when women understood the importance of antenatal care, negative interactions within the healthcare system could undermine their willingness to utilize services. This emphasized the importance of improving patient-centered care, communication, and respectful maternity practices to sustain positive attitudes and enhance utilization.

Objective 3: To identify factors influencing the knowledge and attitude of pregnant women toward antenatal care

The findings indicated that both facilitating and inhibiting factors influenced knowledge and attitude toward antenatal care. Family support emerged as a significant positive influence, suggesting that encouragement from spouses and relatives played a crucial role in shaping women's perceptions and decisions. This result supported the findings of Ononokpono and Odimegwu (2021), who emphasized the role of social norms and interpersonal relationships in maternal healthcare utilization.

Conversely, cultural beliefs, financial constraints, and accessibility challenges were identified as major barriers. Some respondents indicated that traditional beliefs influenced their decisions regarding ANC, which aligned with existing literature highlighting the impact of cultural practices on maternal health behavior. Financial constraints, including transportation costs and indirect expenses, were also found to limit attendance, consistent with the findings of Eke et al. (2023). Additionally, distance to healthcare facilities and transportation difficulties were significant barriers, supporting Uzochukwu et al. (2020), who identified structural challenges as key determinants of healthcare utilization.

These findings demonstrated that knowledge and attitude were shaped by a complex interaction of socio-cultural, economic, and healthcare system factors. The implication was that interventions aimed

at improving ANC utilization must go beyond individual-level education to address broader structural and contextual barriers.

Objective 4: To determine the relationship between knowledge and attitude toward antenatal care services

The study established a positive relationship between knowledge and attitude, indicating that higher levels of knowledge were associated with more favorable attitudes toward antenatal care services. Respondents who were well-informed about ANC were more likely to express trust in healthcare providers, recognize the benefits of regular attendance, and demonstrate willingness to utilize services.

This finding supported behavioural theories such as the Theory of Planned Behaviour and Social Cognitive Theory, which emphasize that knowledge and beliefs influence attitudes, intentions, and ultimately behaviour. It also aligned with empirical evidence suggesting that informed individuals are more likely to adopt positive health behaviours and engage consistently with healthcare services.

However, the relationship was not absolute, as some respondents with adequate knowledge still reported negative attitudes due to poor healthcare experiences or systemic barriers. This indicated that knowledge alone was not sufficient to guarantee positive attitudes or consistent utilization. Instead, it highlighted the need for a multifaceted approach that integrates health education with improvements in service delivery, accessibility, and patient experience.

Overall, the findings demonstrated that knowledge and attitude were interdependent and jointly influenced antenatal care utilization. Strengthening both components through comprehensive interventions was therefore essential for improving maternal health outcomes.

Conclusion

The study concluded that pregnant women attending the Primary Healthcare Centre in Sauka, Abuja generally possessed moderate to high knowledge and positive attitudes toward antenatal care services. However, gaps in knowledge and negative experiences within the healthcare system persisted.

The utilization of antenatal care services was influenced by a combination of individual, socio-cultural, and systemic factors, including education, family support, financial capacity, and accessibility of healthcare services. The positive relationship between knowledge and attitude highlighted the importance of health education in promoting ANC utilization.

Therefore, improving maternal health outcomes requires a comprehensive approach that addresses knowledge gaps, strengthens healthcare systems, and reduces socio-economic barriers to access.

Strengths and Limitations of the Study

Strengths:

- The study utilized a relatively large sample size (456 respondents), enhancing the reliability of the findings.
- The use of a structured questionnaire ensured uniform data collection.
- The study addressed multiple dimensions of ANC utilization, including knowledge, attitude, and influencing factors.

Limitations:

- The cross-sectional design limited the ability to establish causal relationships.
- Data were self-reported, which may have introduced response bias.
- The study was conducted in a single healthcare facility, limiting generalizability to other settings.
- Some respondents may have misunderstood certain questionnaire items despite efforts to ensure clarity.

Contributions to Knowledge

This study made several important contributions to existing knowledge on antenatal care (ANC) utilization, particularly within the context of primary healthcare delivery in Nigeria. First, it provided

context-specific empirical evidence from a semi-urban primary healthcare setting in Sauka, Abuja. While many previous studies relied on national or regional datasets, this study generated localized data that captured the realities, perceptions, and experiences of pregnant women at the facility level. This contributed to a more nuanced understanding of antenatal care utilization patterns within primary healthcare centres, which serve as the first point of contact for most women in Nigeria.

Secondly, the study advanced knowledge by empirically establishing the interrelationship between knowledge and attitude toward antenatal care services. Although prior research had often examined these variables independently, this study demonstrated that knowledge and attitude were not isolated constructs but were interdependent in shaping maternal health behaviour. The findings showed that increased knowledge was associated with more positive attitudes, which in turn influenced willingness to utilize ANC services. This provided stronger evidence for integrated behavioural models that link cognitive awareness with affective and behavioural responses.

Another key contribution of this study was the identification and contextualization of specific barriers affecting antenatal care utilization. While existing literature had broadly identified financial constraints, cultural beliefs, and accessibility issues as barriers, this study offered a more detailed understanding of how these factors manifested within the study population. For instance, it highlighted how transportation challenges, indirect costs, and socio-cultural expectations influenced women's decisions, even when services were available. This contextual insight is valuable for policymakers and healthcare providers seeking to design targeted interventions.

Furthermore, the study contributed by bridging the gap between individual-level and system-level determinants of healthcare utilization. It demonstrated that antenatal care utilization was not solely determined by personal knowledge or attitudes but was also shaped by structural factors such as healthcare accessibility, quality of service delivery, and provider–patient interactions. By integrating these dimensions, the study supported a more holistic approach to maternal healthcare, emphasizing the need for interventions that address both behavioural and systemic constraints simultaneously.

In addition, the study provided empirical support for the application of behavioural and social theories—specifically the Theory of Planned Behaviour, Social Cognitive Theory, and Andersen's Behavioural Model—in explaining maternal healthcare utilization. By aligning the findings with these theoretical frameworks, the study reinforced their relevance in the Nigerian context and demonstrated their applicability in understanding antenatal care behaviours. This theoretical validation contributes to the broader academic discourse by confirming that these models can effectively explain health-seeking behaviour in low- and middle-income settings.

The study also made a methodological contribution by employing a structured quantitative approach with a relatively large sample size, which enhanced the reliability and generalizability of the findings within similar settings. The use of a standardized Likert-scale instrument allowed for systematic measurement of knowledge, attitude, and influencing factors, thereby providing a replicable framework for future research in maternal health.

Moreover, the findings of this study contributed to policy and practice by highlighting actionable areas for intervention, such as improving health education, strengthening healthcare delivery systems, and addressing socio-economic barriers. The identification of these priority areas provides evidence-based guidance for stakeholders, including government agencies, healthcare providers, and non-governmental organizations working in maternal and child health.

Finally, this study enriched the existing body of literature by focusing on the primary healthcare level, which is often underrepresented in maternal health research despite its critical role in service delivery. By emphasizing the experiences and perspectives of women accessing care at this level, the

study provided valuable insights that can inform the design of grassroots-level interventions aimed at improving antenatal care utilization and maternal health outcomes.

Recommendations

Based on the findings of the study, the following recommendations were proposed:

1. Healthcare providers should intensify education on the importance of early booking, recommended ANC visits, and pregnancy risk awareness.
2. Efforts should be made to ensure respectful, patient-centered care to enhance trust and satisfaction among pregnant women.
3. Government and stakeholders should improve transportation systems and establish more accessible healthcare facilities, especially in semi-urban areas.
4. Subsidies or free maternal healthcare programs should be expanded to reduce financial barriers.

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Conflicts of interest

The authors declare that they had no conflicts of interest to report

Authors' contributions

Iyadi, Kingsley C.: Conceptualization, Methodology, Investigation, Data Collection, Writing and Editing

Babatunde Gloria O: Investigation and Data Collection

Otar Mary O.: Investigation, Data Collection and Data Analysis

Data availability statement

All data supporting the findings of this study are available from the corresponding author upon reasonable request and the permission of the Centre for Biomedical Research, Technology and Development, Abuja, Nigeria.

Institutional review board statement

The study protocol was approved by the FCT Health Research Ethics Committee (**FCTHREC-26/ 1126** approved January 15th 2026). Approval was also obtained from the Primary Healthcare Centre Respondents' confidentiality was maintained throughout the study

Informed consent statement

The study protocol was clearly explained to the respondents and their consent obtained before their participation in the study.

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