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Awareness, Use, and Perceived Accuracy of Generative AI Tools among Antenatal Patients at a Tertiary Healthcare Facility in Southeastern Nigeria

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ABSTRACT

Background: Generative artificial intelligence (AI) tools such as ChatGPT are increasingly used for health information, yet little is known about their adoption among pregnant women in low- and middle-income countries. The study assessed the awareness, access, and use of generative AI tools for maternal health information among antenatal patients at the Federal Medical Centre, Umuahia in southeastern Nigeria.

Methods: A descriptive cross-sectional study was conducted among 249 pregnant women attending antenatal care at the Federal Medical Centre, Umuahia, Abia State, Nigeria. Participants were recruited using systematic random sampling. Data were collected using interviewer-administered questionnaires assessing sociodemographic characteristics, technology access, awareness and use of generative AI tools, and perceptions of trust and accuracy. Quantitative data were analyzed using descriptive statistics, while open-ended responses were analyzed thematically.

Results: Most respondents owned smartphones (70.3%) and had internet access at home (60.2%). Daily internet use was reported by 44.2% of participants. Despite widespread digital access, only 32.1% were aware of ChatGPT or similar AI tools, and 10.0% had used them for health-related questions. Among users, common topics included nutrition, medication safety, and pregnancy symptoms. Qualitative findings revealed cautious attitudes toward AI, with many participants expressing concerns about accuracy and preferring guidance from healthcare professionals.

Conclusion: Awareness and use of generative AI tools for maternal health information were low despite high levels of digital connectivity. Efforts to improve digital health literacy and provide guidance on the safe use of AI tools may support their responsible integration into maternal healthcare.

Keywords: Generative artificial intelligence, maternal health information, antenatal care, digital health literacy, pregnant women



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INTRODUCTION

The rapid global advancement of digital technologies has reshaped how individuals access health information, particularly with the emergence of generative artificial intelligence (AI) tools such as ChatGPT, Google Gemini, and similar large language models. These tools simulate human-like interactions and produce tailored responses to user questions,^{1,2} making them increasingly popular for medical explanations, symptom checks, and informal advice.³ Accessibility via smartphones and free online platforms has expanded their reach, especially where traditional healthcare systems face long wait times, limited staffing, and distance barriers.⁴

In maternal health, timely and accurate information is essential for promoting healthy pregnancy outcomes.⁵ Pregnant women often seek guidance on symptoms, medication safety, nutrition, and daily lifestyle decisions. Many now turn first to the internet rather than healthcare providers,⁶ particularly in low- and middle-income countries where structural challenges such as out-of-pocket costs, inconsistent facility access, and long clinical queues shape care-seeking behaviors.⁷⁻⁹ Online platforms, including generative AI tools, are therefore becoming an increasingly visible component of maternal health information ecosystems.

Nigeria has seen rapid growth in digital engagement. Internet penetration is approaching half of the population, driven largely by mobile access.¹⁰ Studies in southeastern Nigeria suggest high awareness of mobile health services among pregnant women,¹¹ and local innovations like the AI-powered maternal health assistant “Sister Agnes” illustrate the potential for stage-specific, accessible pregnancy information.¹² National surveys indicate that approximately 70% of internet users in Nigeria have interacted with AI tools, with many expressing optimism about AI in medicine and science.^{13,14} While these data reflect general populations rather than antenatal women, they provide context for potential engagement with AI-based health tools.

Despite these trends, evidence on awareness and use of generative AI for health in sub-Saharan Africa remains limited. Most studies focus on internet searches, social media, or traditional mobile health messaging rather than AI-driven platforms.^{15, 16} Generative AI differs fundamentally from conventional sources: it can provide interactive, personalized responses, summarize medical content, and adjust explanations to follow-up questions, potentially influencing decision-making in ways not yet fully understood.

Emerging evaluations highlight potential risks. AI-generated medical information can vary in accuracy, sometimes omitting safety details or failing to advise consultation with a healthcare provider.¹⁷⁻¹⁹ The confident tone of AI responses may also affect perceived authority, influencing trust and reliance.²⁰

In low-resource settings, structural barriers and the need for timely guidance make generative AI a potentially convenient resource, though awareness, use, and trust among pregnant women remain unclear.⁹ Factors such as education, age, socioeconomic status, and internet literacy are likely to shape AI adoption. Understanding these dynamics is essential for designing effective digital health literacy initiatives, maternal health communication strategies, and regulatory guidance for safe AI integration.

This study therefore assesses awareness, access, and use of generative AI tools for health information among women attending antenatal care. By examining what pregnant women know about AI, how they access digital tools, and the types of health questions they direct to these platforms, the study provides foundational evidence to inform maternal digital health strategies.

METHODS

Study Design and Setting: This descriptive cross-sectional study was conducted among pregnant women attending antenatal clinics at the Federal Medical Centre (FMC) Umuahia, a tertiary hospital in southeastern Nigeria that provides comprehensive obstetric and maternal health services. The setting attracts a large and diverse patient population, offering an appropriate context for examining awareness and use of generative artificial intelligence tools for health information.

Sample Size and Sampling Technique: The minimum required sample size was estimated using the standard formula for single-proportion studies, based on a presumed prevalence of 63%, a 95% confidence level, and a 5% margin of error.²¹ This yielded a target of 394 participants. Participants were recruited using a systematic random sampling technique among eligible antenatal clinic attendees at the Federal Medical Centre, Umuahia. During data collection, 249 pregnant women were successfully enrolled due to constraints related to clinic attendance patterns, interview flow, and time availability.

Although the achieved sample was smaller than the initial target, it remained adequate for the descriptive aims of this exploratory study. A sample of 249 provides

acceptable precision for estimating awareness and usage patterns of generative AI tools among antenatal clients, with an approximate margin of error of $\pm 6\%$. This level of precision is considered acceptable for descriptive cross-sectional studies aimed at estimating prevalence and usage patterns in exploratory health research.²² Nevertheless, the smaller-than-planned sample size may have reduced the statistical power of the study and limits the precision of estimates compared with the original target sample. Additionally, the findings should be interpreted with caution when generalizing beyond the study population, as the reduced sample size may affect the external validity of the results.

Study Population and Eligibility Criteria: The study included pregnant women aged 18 years and older who were attending routine antenatal clinics. Women in active labor, those who were medically unstable, or those who did not provide consent were excluded from participation.

Data Collection Procedure: Data were collected through interviewer-administered questionnaires in a private area of the clinic. Research assistants trained in standardized interviewing techniques obtained written informed consent and conducted each interview in English or Igbo, depending on participants' preference.

Study Instrument: A structured questionnaire developed from existing literature was used for data collection. The instrument contained both closed-ended and open-ended questions organized into thematic sections covering sociodemographic and obstetric characteristics, technology access, awareness and use of generative AI tools, health information sources, and perceptions of the trustworthiness and usefulness of AI-generated information. The questionnaire was reviewed by experts in maternal health and health communication to establish face and content validity. It was subsequently pretested among a small group of pregnant women who were not included in the final study to assess clarity, comprehensibility, and appropriateness of the questions. Feedback from the expert review and pretest informed revisions before formal data collection. Key study variables included awareness of generative AI tools, use of generative AI tools for maternal health information, frequency of internet use, smartphone ownership, and perceptions of the trustworthiness and usefulness of AI-generated information. Sociodemographic variables included age, marital status, educational level, occupation, parity, and gestational age.

Data Management and Analysis: Completed questionnaires were checked daily for completeness and entered into a secure electronic database. Quantitative data were summarized using frequencies, percentages, means, and standard deviations. Given the exploratory and descriptive objectives of the study, the analysis focused on characterizing awareness, access, and use patterns of generative AI tools rather than testing associations between variables. Qualitative responses from open-ended questionnaire items were analyzed using thematic analysis. Responses were reviewed repeatedly to achieve familiarity with the data and coded line-by-line to identify recurring concepts and viewpoints. Similar codes were grouped into broader thematic categories through an inductive process. Coding decisions were reviewed by members of the research team and differences were resolved through discussion to enhance consistency.

Ethical Considerations: Ethical approval was obtained from the Health Research Ethics Committee of FMC Umuahia. Participation was voluntary, informed consent was obtained, and confidentiality was maintained throughout the study.

RESULTS

Sociodemographic Characteristics

As shown in Table 1, a total of 249 pregnant women participated in the study. The majority of respondents were aged 20–34 years (82.0%), with the highest proportion in the 25–29-year age group (32.1%), followed by those aged 20–24 years (30.1%). Participants younger than 20 years accounted for 4.0%, while those aged 40 years and above represented 3.6% of the sample. Most participants were married (83.5%), a pattern consistent with antenatal clinic populations reported in similar urban Nigerian settings.

Educational attainment varied, with 48.2% of respondents having completed secondary education and 23.7% reporting tertiary education. Primary education was reported by 20.1% of participants, while 8.0% had no formal education.

Table 1: Sociodemographic Characteristics of Respondents (n=249)

Category	Frequency (n)	Percentage (%)
Age Group		
18 – 19	10	4.0
20 – 24	75	30.1
25 – 29	80	32.1
30 – 34	50	20.1
35 – 39	25	10.0
40 and above	9	3.6
Educational Level		
No Formal Education	20	8.0
Primary	50	20.1
Secondary	120	48.2
Tertiary	59	23.7
Marital Status		
Married	208	83.5
Single	30	12.0
Divorced/Separated	5	2.0
Widowed	6	2.4

Technology and Internet Access

Access to digital technology was relatively high among respondents. As shown in Table 2, most participants owned a smartphone (70.3%), indicating widespread availability of mobile devices that support online health information seeking. Although computer ownership was lower (30.1%), a substantial proportion reported having internet access at home (60.2%), suggesting that many had stable connectivity in addition to mobile data.

Patterns of internet use were notable among respondents. Daily internet use was reported by 44.2% of participants, while 22.1% accessed the internet weekly. Monthly use was reported by 12.0%, and 21.7% indicated rare or no internet use.

Table 2: Technology and Internet Access

Category	Frequency (n)	Percentage (%)
Technology Access		
Smartphone Ownership (Yes)	175	70.3
Computer (desktop/laptop) owner	75	30.1
Internet access at home (Yes)	150	60.2
Frequent Internet Use		

Daily	110	44.2
Weekly	55	22.1
Monthly	30	12.0
Rarely/never	54	21.7

Awareness and Use of Generative AI Tools

Awareness of generative artificial intelligence tools was low among respondents as shown in Table 3. Only 32.1% had heard of platforms such as ChatGPT or similar systems, and just 10.0% had ever used AI to obtain health information.

Among the small group who had used AI, engagement was mostly intermittent: 20% reported daily use, 32% weekly use, and the remainder used AI monthly or occasionally.

The questions directed to AI reflected routine pregnancy concerns. Nutrition and dietary guidance were most common (60%), followed by medication or supplement safety (40%) and symptoms or minor illnesses (32%). Fewer respondents sought general pregnancy or parenting advice (20%).

Table 3: Awareness and Use of Generative AI Tools

Category	Frequency (n)	Percentage (%)
Generative AI Awareness/use		
Aware of ChatGPT/AI tools (Yes)	80	32.1
Not aware	169	67.9
Ever used ChatGPT for health questions (Yes)	25	10.0
Never used	224	90.0
Frequency of Use (Among 25 users)		
Daily	5	20.0
Weekly	8	32.0
Monthly	7	28.0
Rarely/ Occasionally	5	20.0
Types of questions asked (among users)		
Nutrition/Diet	15	60.0
Medication/supplement safety	10	40.0
Pregnancy symptoms/infections	8	32.0
General pregnancy advice/parenting	5	20.0

Perceptions of Generative AI

Thematic analysis revealed several recurring patterns, including trust in healthcare professionals, perceived usefulness of AI tools, concerns about accuracy, and the use of AI as a supplementary source of health information. Open-ended responses provided deeper

insight into how antenatal women understood and evaluated the role of generative AI in pregnancy care. A dominant pattern in the accounts was a generally cautious orientation toward these tools. Many participants described generative AI as useful in theory but limited in practice, particularly for decisions involving maternal health. Several women felt that AI tools could not replace the expertise of trained healthcare professionals and expressed worry that relying on automated information might lead to mistakes. Some described AI as something that “*cannot understand my condition*” or “*is not reliable for something as serious as pregnancy*,” reflecting a strong preference for clinician-based guidance. This sense of caution often resulted in complete avoidance of AI platforms, even among women who were comfortable with the internet in general.

Despite this hesitation, a smaller group of respondents acknowledged that generative AI could be helpful in certain situations. These women tended to use AI for quick checks or minor clarifications, such as asking about food safety, understanding routine symptoms, or confirming whether a common discomfort was normal. For them, AI functioned as a convenient first step when immediate access to a healthcare provider was not possible. They described using AI “*just to get an idea*” or “*to check small questions before going to the clinic*,” indicating that its perceived value lay in speed and accessibility rather than authority.

Even among women who had experimented with AI tools, uncertainty about accuracy remained a major concern. Several respondents noted that AI responses sometimes felt too general or conflicted with advice from healthcare workers. Others worried that the system might provide incorrect answers or misinterpret the severity of a symptom. This uncertainty limited consistent engagement and often led women to verify any AI-generated information with a clinician before considering it useful. Some reported that they trusted AI only when its suggestions aligned with information they had already received from the hospital.

DISCUSSION

Understanding how pregnant women engage with digital health information is increasingly important as generative artificial intelligence tools become integrated into everyday technology use. This study found relatively high levels of smartphone ownership and internet access among antenatal clients at a tertiary healthcare facility in

Nigeria, yet awareness and use of generative AI tools remained limited.

The demographic profile of the respondents reflects a young antenatal population, with most women between 20 and 34 years old and over 90% currently married. This distribution is consistent with typical antenatal clinic patterns in Nigeria and other sub-Saharan African settings.^{23, 24} Educational attainment among the respondents was mixed, although nearly half had completed secondary education, a level generally associated with moderate digital literacy.²³ Smartphone ownership and regular internet use were common, indicating that structural conditions necessary for digital health engagement were present.²⁵ These findings align with broader national trends of expanding mobile connectivity and digital health access in Nigeria.²⁶⁻²⁸

Despite this enabling environment, only 32.1% of respondents were aware of AI chatbots and 10% had ever used them for health information. This contrasts with national and global reports of rapid AI uptake, particularly among younger and urban populations⁽¹⁴⁾, and with higher awareness levels reported among Nigerian university students and health professionals.²⁹⁻³¹ The lower awareness observed may reflect differences in digital exposure, competing priorities during pregnancy, or limited integration of AI tools into maternal health information pathways.

Pregnancy is a high-stakes period in which trust strongly shapes health information-seeking behavior. The coexistence of high digital access and low AI use suggests that availability alone does not ensure adoption. Concerns about potential harm and preference for clinician guidance likely influenced reluctance to rely on AI-generated information. Among users, AI queries focused mainly on nutrition, medication safety, and common symptoms, topics consistent with established maternal information needs.³² However, usage remained occasional, indicating that AI functions more as a supplementary convenience than a trusted source of care guidance.

Qualitative findings reinforced this cautious orientation. Many respondents expressed skepticism about the reliability of AI-generated advice and emphasized that such tools cannot replace trained healthcare providers. These concerns mirror broader global attitudes, where trust in AI for clinical decision-making remains limited.³³ Even when AI was viewed as useful for quick clarification, women often cross-checked information with healthcare professionals before acting on it.

These findings suggest that digital access alone is insufficient to drive AI adoption in maternal health. Awareness, perceived accuracy, trust, and the sensitive nature of pregnancy-related decisions shape engagement with AI systems. Targeted digital health literacy initiatives and clear guidance on the safe use of AI tools may support responsible integration into antenatal care. Antenatal education programmes could incorporate discussions on the benefits, limitations, and appropriate use of AI-based health information tools, helping pregnant women develop the skills they need to critically evaluate AI-generated content. Clinicians also have an important role in guiding the use of these technologies by helping patients distinguish reliable information from potentially inaccurate advice and encouraging verification of AI-generated recommendations during antenatal consultations. Such an approach may promote informed and safe engagement with AI tools while maintaining healthcare professionals as the primary source of maternal health guidance.

Generative AI remains an emerging health information source in this context. Understanding these early adoption patterns provides important direction for future maternal digital health strategies and research.

Implications of the findings of the study

The findings of this study have important implications for clinical practice. Although smartphone ownership and internet access were common among participants, awareness and use of generative AI tools for maternal health information remained limited. Healthcare providers involved in antenatal care should therefore recognize the growing presence of digital information sources and actively engage pregnant women in discussions about the opportunities and limitations of AI-generated health information. Clinicians can play a key role in helping women assess the credibility of information obtained from digital platforms and encouraging the verification of AI-generated advice during routine antenatal consultations.

From a policy perspective, the findings highlight the need for digital health literacy initiatives that address emerging AI technologies within maternal health programmes. Antenatal education sessions could incorporate guidance on the safe and appropriate use of AI tools, while health authorities and professional bodies may consider developing recommendations for the responsible use of AI-generated health information during pregnancy. Such measures may help improve

informed decision-making and reduce the risk of misinformation.

The study also identifies important directions for future research. Further studies involving larger and more diverse populations are needed to examine factors associated with awareness, acceptance, and use of generative AI tools among pregnant women. Longitudinal and multicentre studies could provide deeper insights into changing patterns of AI adoption, while analytical studies employing inferential statistical methods may help identify determinants of AI use and trust in maternal health contexts.

Strength and Limitations

This study provides early empirical evidence on awareness and use of generative artificial intelligence tools for maternal health information among antenatal women in Nigeria, where published data remain limited. The combination of quantitative and qualitative responses enhances understanding of both usage patterns and perceptions of trust.

However, the study was conducted at a single tertiary facility, which may limit generalizability. Data were self-reported and subject to recall or social desirability bias. The cross-sectional design precludes causal inference or assessment of changes over time. Additionally, qualitative insights were derived from brief open-ended responses rather than in-depth interviews, which may have limited exploration of attitudes toward AI.

Despite these limitations, the findings provide useful baseline evidence to guide future longitudinal and qualitative research.

CONCLUSION

Although smartphone ownership and internet access were common among antenatal women attending a tertiary healthcare facility in southeastern Nigeria, awareness and use of generative AI tools for maternal health information were low. AI chatbots are not yet a routine component of health information-seeking in this setting. However, the existing digital connectivity provides a foundation for future digital health initiatives. Improving digital health literacy, strengthening trust, and providing clear guidance on safe AI use may support responsible integration of these tools into maternal health communication. Further research should examine longitudinal trends and the quality of AI-generated maternal health information.

Abbreviations:

AI – Artificial Intelligence

FMC – Federal Medical Centre

WHO – World Health Organization

Declarations

Authors' contribution: OO conceived the study, designed the methodology, supervised the research, interpreted the results, and revised the manuscript. KF contributed to the data collection, data analysis, and drafting the manuscript. AJA contributed to the data collection, data analysis, literature review, and manuscript review. UGE contributed to the data collection and manuscript editing. All authors read and approved the final version of the manuscript.

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Ethical Conformity Statement: This study was conducted in accordance with established ethical standards. Ethical approval was obtained from the Health Research Ethics Committee of Federal Medical Centre (FMC), Umuahia, Abia State, Nigeria. FMC Written and verbal informed consent was obtained from all participants prior to data collection. Participant confidentiality and anonymity were assured, and no financial incentives were provided. All data were securely stored and accessed only by the research team.

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