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Insights into the Importance of Regular Antenatal Care Visits for Improving Delivery Outcomes in Pregnant Patients: A Cross-Sectional Study

Charity Nneka John-Emaimo[1] (ORCID ID: 0009-0006-9472-9100),
Alice John Emaimo[2] (ORCID ID: 0000-0002-6762-6599),
Ikemesit Udeme Peter [1*] (ORCID ID: 0000-0001-9890-8786)
[1]Department of Public Health, Faculty of Healthcare Services,
Federal University of Allied Health Sciences, Trans-Ekulu, Enugu, Nigeria
[2]Department of Foreign Languages, Institute of Medicine RUDN,
Peoples Friendship University of Russia

ABSTRACT

Background: Regular antenatal care (ANC) visits are a cornerstone of preventive healthcare during pregnancy, enabling early detection and management of complications, health education, and promotion of healthy behaviors. Despite global healthcare advancements, maternal and neonatal mortality rates remain unacceptably high in many regions, particularly in low- and middle-income countries like The Gambia. This study examines the impact of regular ANC visits on maternal health outcomes at the Edward Francis Small Teaching Hospital in Banjul. ***Materials and Methods:*** We analyzed 200 antenatal medical records of women who delivered in the hospital's obstetric unit, assessing their antenatal care visit and delivery outcomes. ***Results:*** Nearly all pregnant women (98.5%) attended ANC, with 44% making 3-4 visits, 35.5% making 5-6 visits, and 10.5% completing 7-8 visits. Postpartum hemorrhage (PPH) and preeclampsia were most prevalent among women with 1-4 ANC visits (PPH: 5.6%-2.3%; preeclampsia: 11.1%-4.5%) but absent in those with 5-8 visits. Younger women (18-25 years) and those without formal education had higher PPH rates (66.7%) compared to older (26-40 years: 33.3%) and more educated women (tertiary-educated: 0%). ***Conclusion:*** Regular ANC attendance (7-8 visits) was associated with better delivery outcomes with no risk of pregnancy related complications like preeclampsia and preeclampsia, postpartum hemorrhage. Improving antenatal care visits requires a focus on improving women's health literacy, fostering shared clinical decision-making, and ensuring patient-centered follow-up. Strengthening health systems through better data monitoring, upgraded facilities, and improved healthcare worker training is critical for delivering equitable, high-quality maternal care. Policymakers must prioritize locally adapted, evidence-based interventions to advance maternal health services in The Gambia.

Keywords: antenatal care visit, delivery outcome, pregnant women, preeclampsia, postpartum hemorrhage

INTRODUCTION

Antenatal care (ANC) visits, also known as prenatal care visits, are a significant component of maternal healthcare, delivered by skilled health professionals to pregnant women and adolescents to optimize health outcomes for both mothers and newborns (WHO, 2016; WHO, 2018). Antenatal care visits encompass a range of services, including health assessments, screening for risk factors, vaccinations (e.g., tetanus), nutritional supplementation (such as iron and folic acid) (WHO, 2020), and the prevention or

*Corresponding Author

management of pregnancy-related complications (WHO, 2016; WHO, 2018). These visits facilitate early detection of conditions like preeclampsia, postpartum hemorrhage risk factors, and fetal abnormalities, enabling timely interventions (Poon *et al*., 2019; Ala *et al*., 2021).

Beyond clinical care, antenatal care visits serve as a platform for health education, providing guidance on nutrition, exercise, and warning signs of complications. Counseling during these visits empowers women to seek timely medical assistance and fosters trust between patients and healthcare providers, improving adherence to medical advice and overall satisfaction with care.

Despite their importance, inadequate antenatal care visits remain a significant challenge in many African countries, including The Gambia, where a substantial proportion of women lack access to basic prenatal services (UNICEF, 2019; WHO, 2019). Many resort to delivering in unsafe, non-healthcare settings, increasing risks for maternal and neonatal health (Yaya *et al*., 2020). The WHO and Gambian Ministry of Health recommend eight ANC visits, with the first occurring before 12 weeks of gestation (Paulson & GBD 2019 Under-5 Mortality Collaborators, 2021; WHO, 2012). However, studies indicate that most women in sub-Saharan Africa, including The Gambia, initiate ANC later than advised (Jihad *et al*., 2022; Al-Wutayd, 2020; Manda-Taylor, 2017; Ramotsababa & Setlhare, 2021).

Delayed ANC initiation is associated with adverse outcomes, including preterm birth, low birth weight, and increased healthcare costs (Tolefac *et al*., 2017; Some *et al*., 2020; Allen *et al*., 2012). In The Gambia, while ANC attendance rates are high (over 90% of pregnant women attend at least once), most women begin care late only 8.1% start in the first trimester, compared to 62.8% in the second and 29.1% in the third trimester (Anya *et al.*, 2008). Factors influencing timely initiation includes maternal age, marital status, parity, wealth, residence, and religion (Nigatu & Birhan, 2023; Daniels-Donkor *et al*., 2024).

Despite high satisfaction rates with ANC services in The Gambia (79.9% in public and 97.9% in private facilities) (Jallow *et al*., 2012), inconsistent utilization patterns and late initiation persist. However, there remains a gap in research on how regular antenatal care visits enhance quality delivery outcomes in The Gambian context. To address this, our study aims to evaluate the importance of adherence to the WHO-recommended eight-visit ANC schedule on maternal and neonatal health outcomes using a cross-sectional design.

MATERIALS AND METHODS

Study Design and Study Area

This cross-sectional study was conducted at Edward Francis Small Teaching Hospital (EFSTH) in Banjul, The Gambia, located at 13°27′27″N, 16°34′39″W. As the country's largest tertiary referral hospital, EFSTH plays a pivotal role in Gambia's healthcare system. Originally established in 1853 during British colonial rule as the Royal Victoria Teaching Hospital (RVTH), it was renamed in 2013 in honor of Edward Francis Small, a Gambian nationalist. Since the 1990s, EFSTH has also served as a teaching hospital in partnership with the University of The Gambia, offering a six-year MBBS program to reduce reliance on foreign-trained doctors. By 2011, it had graduated 76 physicians. The hospital's pediatrics department has a 100-bed capacity, admitting approximately 3,000 patients annually, primarily for severe malaria, acute respiratory infections, malnutrition, septicemia, and gastroenteritis.

Maternal healthcare in The Gambia is government-funded and free, with EFSTH serving as a key provider of obstetric and neonatal services (The Standard News, 2019). Given its central role in medical education and high patient volume, EFSTH was an optimal setting for this study on antenatal care and maternal health outcomes.

Study Population and Sampling Methodology

The study population included all pregnant women residing in The Gambia who delivered at the Edward Francis Small Teaching Hospital (EFSTH) in Banjul. Based on medical records obtained from the hospital's Medical Records Department, the facility records an average of 400 pregnant women admitted monthly. This figure was used to define the study population. A convenience sampling approach was employed, selecting 200 women who delivered in the Obstetric Unit of EFSTH between 16 December 2021 and 20 January 2022. The sample size was determined at a 95% confidence level with a 5% margin of error (0.05). Exclusion criteria; the study excluded women who delivered outside EFSTH, and pregnant women who declined consent to participate.

Data Collection

The study analyzed data collected from antenatal record cards and delivery notes (Table 1), obtained from labor ward records at Edward Francis Small Teaching Hospital. A structured data collection tool was used to extract socio-demographic information (including maternal age and education level) (Table 2) as well as clinical details of pregnancy related complication (such as postpartum hemorrhage and preeclampsia).

Table 1: Form Designed for the Number of Visits in the Antenatal care as recorded in the delivery room

Number of antenatal visit	Outcome of delivery
1) Unbooked 2) Booked	
Booked; Range of number of visits	
(1) 1-2 visits	
(2) 3-4 visits	
(3) 5-6 visits	
(4) 7-8 visits	
Clinical details	
Postpartum hemorrhage	
Preeclampsia	

Table 2: Socio-demographical variable of the mother

Variables	Types	Dimension
Age	Quantitative discrete	<18 18 to 25 26 to 40 > 40
Maternal education	Qualitative ordinal	Non formal/vocational Primary Junior Senior Tertiary

RESULTS

As presented in Figure 1, the analysis of ANC registration revealed that the majority of respondents (197 women, 98.5%) had attended booked antenatal care visits, while only a small proportion (3 women, 1.5%) were unbooked.

Figure 2 presents the distribution of antenatal care visits among respondents. The data reveal that the majority of participants (88, 44.0%) attended 3-4 visits, followed by 71 respondents (35.5%) who completed 5-6 visits. A smaller proportion (21, 10.5%) reported 7-8 visits, while minimal attendance was observed for 0 visits (1, 0.5%) and 1 visit (1, 0.5%).

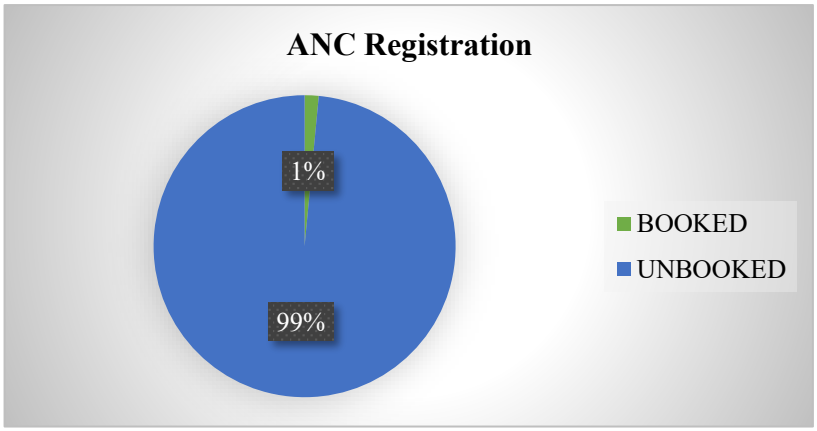

Figure 1: Pie-chart showing ANC Registration analysis

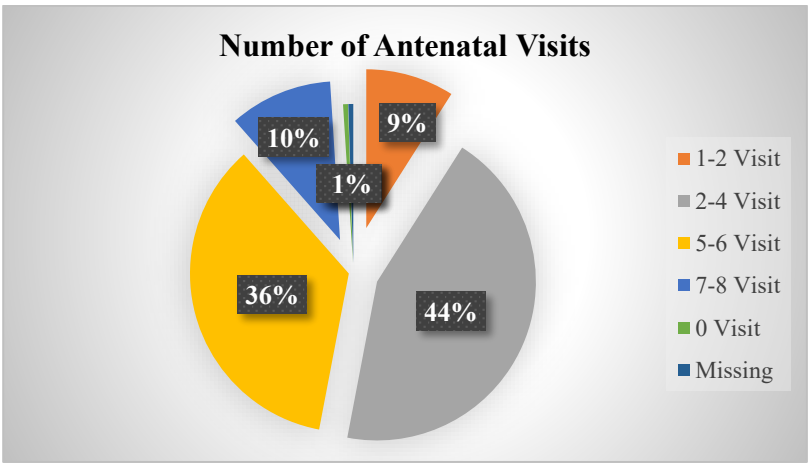

Figure 2: Pie-chart showing the number of antenatal visits

Table 3: Delivery outcome according to number of antenatal visits

Delivery outcome		Number of antenatal visits					Total
		1-2	3-4	5-6	7-8	0	
Normal	**Count**	15	82	71	21	1	190
	% within Number of antenatal visits	7.5%	41.0%	35.5%	10.5%	0.5%	95.5%
Postpartum Hemorrhage	**Count**	1	2	0	0	0	3
	% within Number of antenatal visits	5.6%	2.3%	0.0%	0.0%	0.0%	1.5%
Preeclampsia	**Count**	2	4	0	0	0	6
	% within Number of antenatal visits	11.1%	4.5%	0.0%	0.0%	0.0%	3.0%
Total	**Count**	18	88	71	21	1	199
	% within Number of antenatal visits	9.0%	44.0%	35.1%	10.5%	0.5%	99.1%

Table 4: Delivery outcome according to age

Delivery outcome		Age				Total
		Less than 18 years	Between 18 to 25 years	Between 26 to 40 years	Above 40	
Normal	**Count**	9	88	89	4	190
	% within delivery outcome	4.7%	46.8%	46.3%	2.1%	100.0%
Postpartum Hemorrhage	**Count**	0	2	1	0	3
	% within delivery outcome	0.0%	66.7%	33.3%	0.0%	100.0%
Preeclampsia	**Count**	0	4	3	0	7
	% within delivery outcome	0.0%	57.1%	42.9%	0.0%	100.0%
Total	**Count**	9	94	93	4	200
	% within delivery outcome	4.5%	47.0%	46.5%	2.0%	100.0%

Table 5: Delivery outcome according to spouse education

Delivery outcome		Spouse Education					Total
		Non-Formal Vocational	Primary	Junior	Senior	Tertiary	
Normal	**Count**	40	39	19	89	3	190
	% within delivery outcome	21.1%	20.5%	10.0%	46.8%	1.6%	100.0%
Postpartum Hemorrhage	**Count**	2	0	0	1	0	3
	% within delivery outcome	66.7%	0.0%	0.0%	33.3%	0.0%	100.0%
Preeclampsia	**Count**	2	1	1	3	0	7
	% within delivery outcome	28.6%	14.3%	14.3%	42.9%	0.0%	100.0%
Total	**Count**	44	40	20	93	3	200
	% within delivery outcome	22.0%	20.0%	10.0%	46.5%	1.5%	100.0%

DISCUSSION

A healthy pregnancy significantly increases the likelihood of a healthy birth. Early and regular prenatal care is crucial for achieving positive maternal and child health outcomes, particularly when accompanied by high-quality healthcare services. Antenatal care (ANC) visits play a vital role in monitoring and supporting maternal health throughout pregnancy.

Figure 1 presents analysis of ANC registration, revealing that 197 respondents (98.5%) were booked for ANC, while only 3 (1.5%) were unbooked. The low proportion of unbooked

pregnancies may stem from referrals from private tertiary healthcare facilities, whereas booked participants likely chose the hospital due to concerns about healthcare quality.

Figure 2 illustrates the distribution of ANC visits among respondents. The majority (88, 44.0%) attended 3-4 visits, followed by 71 (35.5%) who completed 5-6 visits. While the exact reasons for the lower visit frequency were not ascertained, prior studies in The Gambia suggest that late initiation of ANC is common (Anya *et al*., 2012). Only 8.1% of women began ANC in the first trimester, while 62.8% and 29.1% initiated care in the second and third trimesters, respectively. Factors such as low education, poverty, maternal age, marital status, residence, and religious beliefs may contribute to suboptimal adherence to the WHO-recommended eight ANC visits. Additionally, fear and superstitious beliefs may deter some women from seeking ANC.

Our findings indicate that 3-4 ANC visits were associated with a higher proportion of successful deliveries (41.0%) compared to those with more than four visits (Table 3). However, these cases were often accompanied by complications such as postpartum hemorrhage (PPH) and preeclampsia. Despite the relatively positive outcomes, the visit frequency falls short of the WHO's updated recommendation of at least eight ANC contacts (WHO, 2016). The WHO emphasizes the importance of early and frequent ANC visits to enhance maternal and neonatal health. The revised guidelines (WHO, 2016; WHO, 2020) advocate for: eight structured ANC contacts, with the first occurring within the first 12 weeks. Essential interventions, including blood/urine tests, intermittent preventive treatment for malaria (IPTp), and risk assessment for conditions like preeclampsia and continuity of care to facilitate early detection and management of complications. Non-compliance with these recommendations in our study population was linked to higher incidences of PPH and preeclampsia, which could have been mitigated through regular monitoring. In LMICs, accessibility issues such as financial constraints, long distances to healthcare facilities, were widely reported to affect subsequent ANC visits after initiation attendance (Manz *et al.*, 2010; Khatri *et al*., 2022). Additionally, sociocultural factors, including patriarchal decision-making and spiritual beliefs, influence women's ability to seek timely care (Kisuule *et al*., 2013; Ebonwu *et al*., 2018). Furthermore, quality of care factors, including health worker skills and attitudes, affect ANC visits in most LMIC contexts (Khatri *et al.,* 2022). Inequalities in care quality have been noted in certain settings, indicating their potential impact on disparities in ANC attendance. A study in Kenya found the youngest, poorest, least educated, most disadvantaged, and most disempowered women are most likely to report poor experiences of care (Afulani *et al.,* 2019). This suggests sustained patient-centred efforts are needed to address health inequalities and improve ANC visits. Interventions such as community health worker (CHW) programs, financial incentives, and mobile health campaigns have shown mixed success in improving ANC uptake (Mbuagbaw *et al*., 2015). For example, providing community health workers with free home pregnancy tests in a randomized controlled trial in Madagascar significantly improved pregnancy care by enabling early pregnancy confirmation and antenatal counselling (Comfort *et al.,* 2019). Also instance, in Kenya, CHWs significantly increased ANC attendance through home visits and referrals (Alhassan *et al*., 2024; USAID SQALE *et al.,* 2019; Maryline Mireku *et al.,* 2019; Karuga *et al.,* 2019). Similar strategies could be adopted in The Gambia to enhance ANC compliance.

Only 10.5% of women in our study achieved 7-8 ANC visits, and none experienced pregnancy-related complications (Table 3). This underscores the protective effect of structured ANC in reducing risks such as PPH and preeclampsia. For Postpartum Hemorrhage (PPH), frequent ANC enables early identification of risk factors (e.g., anemia, prior PPH) and prophylactic measures (e.g., uterotonics). Regarding, preeclampsia, regular blood pressure monitoring and urine testing facilitate early diagnosis, allowing for timely interventions (e.g., antihypertensives, magnesium sulfate). In contrast, women with 1-4 visits

faced higher complication rates, highlighting the consequences of inadequate prenatal care. In some communities, superstitious beliefs deter women from completing the recommended 7-8 ANC visits. Many avoid disclosing their pregnancy status beyond the fourth or fifth month due to fears of miscarriage, curses, or witchcraft. This cultural barrier highlights the need for a sensitive, community-based approach to maternal care. Trained health workers can mitigate these concerns by offering discreet pregnancy testing, culturally appropriate counseling, and facilitated referrals. However, to achieve meaningful progress, such initiatives must be integrated with broader strategies that address both demand-side (e.g., education, financial access) (Ekuma *et al.,* 2023) and supply-side (e.g., healthcare availability, quality) barriers to ANC utilization.

Only a small proportion of the study population adhered to the recommended 7-8 ANC visits. This gap whether due to negligence or limited awareness of antenatal care guidelines poses a significant barrier to achieving the Sustainable Development Goals (SDGs) by 2030 (United Nations, 2016; Ala *et al.,* 2021). Notably, our data suggest that hospital deliveries alone do not guarantee positive maternal and neonatal outcomes when ANC services are underutilized (Gabrysch *et al*., 2019). Many women appear to prioritize facility registration for childbirth over consistent antenatal visits, reflecting a transactional approach to care. While access to ANC has improved, persistent disparities between healthcare providers and recipients highlight unmet needs in education and engagement. Further large-scale surveys are needed to explore this disconnect. Compounding the issue, a qualitative study in Cameroon revealed that pregnant women often perceive pregnancy as a natural state not requiring medical intervention, leading to delayed or insufficient ANC initiation (Warri & George, 2020).

Postpartum hemorrhage (PPH) and preeclampsia were common among pregnant women with 1–2 and 3–4 antenatal care (ANC) visits (Table 3). These conditions are leading causes of maternal mortality, and structured ANC plays a crucial role in early detection, prevention, and management.

For postpartum hemorrhage, frequent ANC visits allow healthcare providers to identify risk factors such as anemia, previous PPH, or uterine abnormalities. Regular monitoring ensures timely interventions, including iron supplementation, prophylactic uterotonics, and birth planning to prevent excessive bleeding. Additionally, education on danger signs empowers women to seek prompt care. However, only 2–4 visits may miss critical interventions, increasing the risk of undetected complications and severe bleeding.

In low- and middle-income countries (LMICs), preeclampsia accounts for 10–15% of maternal deaths (Beyuo *et al*., 2023). Due to the increasing burden of comorbid conditions in reproductive-aged women and the complexity of managing hypertensive disorders of pregnancy (HDP), these disorders have overtaken PPH as the leading cause of maternal mortality in many LMICs (Beyuo *et al*., 2023).

For preeclampsia with severe features requiring prompt delivery, ANC facilitates early identification, referral, and management. In cases without severe features before term, regular ANC enables close monitoring of blood pressure, laboratory values, and symptoms (Beyuo *et al*., 2023). Beyuo *et al*. (2023) found that fewer complications occur when ANC is received at tertiary facilities. While ≥8 ANC visits reduced poor neonatal outcomes, they did not significantly impact maternal complications, highlighting the importance of quality ANC.

The eight-visit model enhances early detection through consistent blood pressure monitoring and urine protein tests. Early identification of hypertensive disorders allows for timely management with antihypertensives, magnesium sulfate (for severe cases), and planned delivery when necessary. Close follow-up reduces treatment delays, preventing eclampsia and other severe complications. Conversely, fewer visits delay detection, increasing risks of uncontrolled hypertension, seizures, or maternal death.

Numerous studies show that pregnant women with preeclampsia face significantly higher risks of maternal complications, including placental abruption and fetal growth restriction, leading to adverse perinatal outcomes such as preterm delivery (Sibai *et al*., 1993) and long-term cardiovascular disease (Mongraw-Chaffin *et al*., 2010). Thus, monitoring and managing chronic hypertension complicated by preeclampsia have become global priorities.

Although our study did not assess preeclampsia risk factors, the cross-sectional design and reliance on medical records limited our ability to capture previous histories of preeclampsia. Given the higher prevalence among women with 1–2 ANC visits, risk factors such as family history of preeclampsia, prior preeclampsia, pregnancy intervals ≥10 years, and primiparity (Lecarpentier *et al*., 2013) should not be overlooked. A recent study also confirmed that a history of preeclampsia increases the risk of recurrence in women with chronic hypertension (Nie *et al*., 2024). Umbilical artery blood flow resistance normally decreases with advancing gestational age, reflecting improved maternal-fetal blood exchange and fetal growth (Xiao & Wang, 2019). After 30 weeks of gestation, the umbilical artery resistance index (S/D) should be ≤3 (Ayati *et al*., 2011). An elevated or rising S/D ratio in the third trimester indicates increased placental resistance, potentially leading to fetal hypoxia or distress.

In pregnant women with chronic hypertension, prolonged high blood pressure causes systemic vasospasm, increasing the risk of severe complications (e.g., placental abruption, HELLP syndrome, preterm delivery) when preeclampsia develops (Yu *et al*., 2015). Our findings align with Nie *et al*. (2024), who reported that a history of preeclampsia, longer hypertension duration, and lack of systematic antihypertensive treatment elevate risks. WHO's 8-visit ANC framework strengthens health systems by promoting continuity of care, risk stratification, and patient education, thereby reducing PPH and preeclampsia risks.

Our study found higher rates of postpartum hemorrhage (PPH) among women aged 18-25 compared to those aged 26-40, contrary to the typical pattern where risks increase with advanced maternal age (≥35). This disparity may stem from several factors: (1) Primiparity and uterine atony - younger women are more likely to be first-time mothers, increasing risks of inefficient uterine contractions; (2) Traumatic deliveries more frequent perineal tears, episiotomies, and instrumental deliveries in this group; (3) Labor complications - prolonged labor common in first births; (4) Undiagnosed bleeding disorders that manifest during childbirth; and (5) Reduced access to care, with younger women potentially receiving less prenatal monitoring and skilled birth attendance. These findings suggest that while age ≥35 remains a risk factor, the 18-25 age group faces unique challenges from first-time delivery experiences and suboptimal care. Universal oxytocin use and improved obstetric care could potentially mitigate these risks.

Similarly, preeclampsia rates were unexpectedly higher in women aged 18-25 versus 26-40, despite typically being associated with adolescents (<20) and women >35. Contributing factors include: (1) First-pregnancy risks from inadequate placental vascular remodeling and immune maladaptation (Robillard *et al*., 2022; Kornacki *et al*., 2024); (2) Limited prenatal care leading to missed early warning signs; (3) Higher rates of unplanned pregnancies with poorer preconception health; (4) Stronger immune responses in younger mothers; and (5) Socioeconomic disadvantages including financial stress and poor nutrition. These findings highlight that biological age alone doesn't explain preeclampsia risk - parity, care access, and social determinants play crucial roles. Targeted interventions for young first-time mothers could help address this disparity.

Education level also significantly impacted outcomes. Table 5 shows higher PPH rates among non-formally educated women compared to secondary-educated counterparts, likely due to: (1) Limited health literacy reducing awareness of danger signs; (2) Poorer access to skilled care resulting in delayed treatment and more home births; (3) Higher anemia and

malnutrition rates impairing clotting ability; and (4) Cultural barriers delaying care-seeking. As demonstrated by Afulani *et al*. (2019) and Daniels-Donkor *et al.* (2024), education empowers women to navigate healthcare systems effectively. Improving health literacy and addressing socioeconomic barriers could significantly reduce these disparities.

In summary, both young maternal age (18-25) and lower education levels independently increase risks for PPH and preeclampsia, mediated through biological, obstetric, and socioeconomic pathways. These findings underscore the need for targeted interventions addressing first-time mothers' unique needs and improving healthcare access for disadvantaged groups. Therefore, policy measures should actively enhance health literacy, shared decision-making, and patient self-management as key components of the healthcare services people prioritize. For example, a study on healthcare access and women's empowerment in Myanmar revealed that empowered women, particularly in rural areas, were more able to seek medical care (Htu *et al*., 2021), underscoring the critical role of empowerment in healthcare accessibility.

STRENGTHS AND LIMITATIONS

This study provides valuable insights into the relationship between regular antenatal care (ANC) visits and quality delivery outcomes, particularly regarding compliance with the WHO-recommended 8-visit protocol. However, several limitations should be acknowledged. First, data were extracted from ANC registers, which may raise concerns about reliability despite reviews by hospital staff. Additionally, key variables influencing maternal healthcare utilization—such travel distance, and cultural barriers were not fully captured. The cross-sectional design also limits the ability to establish causal relationships, particularly in understanding why some women attended only 1-4 ANC visits instead of the recommended 8, as well as other predictor variables beyond the study's scope. Despite these limitations, the findings reinforce the importance of completing 7-8 ANC visits for optimal delivery outcomes. At the same time, they highlight the persistent underutilization of this protocol, which remains a challenge in both population adherence and healthcare system implementation.

CONCLUSION

Our findings suggest that completing 7-8 ANC visits is associated with improved delivery outcomes and a reduced risk of pregnancy-related complications, such as preeclampsia and postpartum hemorrhage. While some women achieved successful deliveries with only 3-4 ANC visits, this group experienced higher rates of complications. To align with the Sustainable Development Goals (SDGs) by 2030 particularly in low-resource settings like The Gambia sustained improvements in ANC utilization are critical. This requires a multifaceted approach, including:

1. Enhancing the quality and availability of ANC services,
2. Addressing barriers and motivators for ANC attendance,
3. Promoting incentives for health system strengthening, and
4. Prioritizing integrated, patient-centered care over fragmented vertical programs.

Further research, including multi-center cohort studies across different regions of The Gambia, is needed to validate and expand upon these findings.

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AUTHOR'S CONTRIBUTIONS

All authors investigated the study, did literature searches and did data validation and visualization. All the authors reviewed and approved the final draft, and are responsible for all aspects of the work.

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None.

CONFLICT OF INTEREST

None.

ETHICAL APPROVAL

This study was conducted in accordance with ethical research guidelines. Full ethical approval documentation can be provided by the author upon formal request.

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