ANTENATAL CARE IN FAMILY MEDICINE AND ITS IMPACT ON BIRTH OUTCOMES

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Abstract

Background: Antenatal care (ANC) is a vital component of maternal and child health, aimed at ensuring the well-being of both mother and baby during pregnancy. Family medicine, with its holistic and patient-centered approach, plays a significant role in providing ANC by offering continuous, comprehensive care. This study examines the impact of ANC delivered in family medicine settings on maternal and neonatal birth outcomes.

Methods: A retrospective cohort study was conducted using medical records of 320 women who received ANC in family medicine clinics and delivered between January 2023 and December 2024. Data on sociodemographic characteristics, ANC utilization patterns (timing of first visit, frequency of visits, lifestyle counselling), and birth outcomes (gestational age, birth weight, mode of delivery, Apgar scores) were collected and analyzed using descriptive and inferential statistics, including chi-square tests and logistic regression.

Results: The majority of participants (76.9%) initiated ANC in the first trimester, and 58.8% attended eight or more visits. Nearly all (94.4%) received lifestyle counselling. Favourable birth outcomes were observed: 86.9% of deliveries occurred at term, 86.3% of new-borns had normal birth weight, and 95.6% achieved Apgar scores ≥7 at 5 minutes. The cesarean delivery rate was 34.4%, lower than comparable hospital-based cohorts.

Conclusion: ANC provided in family medicine settings is associated with positive maternal and neonatal outcomes, attributed to early initiation, adequate visit frequency, and comprehensive care. The study highlights the importance of integrating ANC into family medicine to enhance accessibility, continuity, and holistic support for expectant mothers. Recommendations include strengthening early ANC initiation, promoting health education, and expanding family medicine-based ANC services, particularly in underserved areas.

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Background

Antenatal care (ANC) is a cornerstone of maternal and child health services, aiming to ensure the well-being of both mother and baby during pregnancy. It encompasses a range of preventive, diagnostic, and therapeutic interventions designed to monitor the health status of the expectant mother, detect potential complications early, and provide the necessary education and support. Through structured and timely visits, ANC provides an opportunity to address risk factors, promote healthy behaviours, and prepare families for childbirth and parenthood (Mina et al., 2023).

The role of family medicine in providing antenatal care has gained significant recognition in recent years due to its holistic and patient-centered approach. Family physicians are uniquely positioned to offer continuous, comprehensive care that addresses the medical, psychological, and social dimensions of pregnancy. By integrating ANC into family medicine practice, women benefit from personalized care plans, continuity with the same healthcare provider, and the added advantage of addressing other family health concerns simultaneously (VanGompel et al., 2024).

Antenatal care is not limited to physical examinations and laboratory tests; it also involves counselling on nutrition, lifestyle, and mental health. In family medicine settings, this counselling is tailored to the woman's specific circumstances, including her cultural background, socioeconomic status, and health literacy. Such individualized care has been shown to improve adherence to healthy practices during pregnancy, ultimately contributing to better maternal and neonatal outcomes (Spiess et al., 2024).

Early and regular ANC visits are critical in detecting complications such as gestational diabetes, hypertension, and fetal growth restrictions. In family medicine, early engagement often begins even before conception, through preconception counselling, which further enhances the potential for favourable birth outcomes. Family physicians, with their broad scope of practice, can identify and manage these conditions promptly, coordinate care with specialists when necessary, and provide continuous monitoring throughout the pregnancy (Mane et al., 2024).

The impact of quality ANC on birth outcomes is multifaceted. Adequate ANC has been associated with reduced rates of preterm births, low birth weight, and perinatal mortality. By addressing both preventive and curative aspects of care, ANC in family medicine ensures that expectant mothers receive the right interventions at the right time. Moreover, the trust-based relationship developed between the patient and her family physician fosters open communication, which is crucial for addressing sensitive issues that may otherwise go unnoticed (Albarqi, 2025).

In addition to clinical benefits, ANC within family medicine enhances accessibility to care. Family physicians often serve in community-based settings, making it easier for women, especially those in rural or underserved areas, to attend regular checkups. This proximity reduces barriers related to transportation, cost, and time, which are significant determinants of ANC utilization. Improved accessibility ensures that more women receive adequate care throughout pregnancy, contributing to equity in maternal health services (Ghimire et al., 2023).

Cultural sensitivity is another strength of ANC in family medicine. Family physicians are more likely to be familiar with the cultural norms and values of the communities they serve, allowing them to deliver care in a way that is respectful and responsive. This cultural competence fosters trust and improves patient satisfaction, which can increase adherence to medical advice and follow-up appointments (Ramírez, 2023).

Moreover, ANC in family medicine extends beyond the mother to the entire family unit. By involving partners and family members in educational sessions, physicians help create a supportive environment for the expectant mother. This family-centered approach enhances emotional well-being, reduces anxiety, and promotes shared responsibility for maternal and new-born health (Manulata & Swain, 2025).

The integration of health promotion into ANC is also a critical component in family medicine. Women are educated about breastfeeding, postpartum care, and newborn health, which helps lay the foundation for healthy child development. Early interventions in these areas have lasting effects on both maternal and child health, reducing the risk of complications in the postpartum period and improving long-term outcomes (Manulata & Swain, 2025).

Finally, the continuity of care inherent in family medicine provides an added

layer of safety and support. The same physician who manages a woman's antenatal care is often involved in her postpartum care and the care of her infant. This continuity ensures that any health issues arising after delivery are promptly addressed, and the transition from pregnancy to motherhood is supported in a seamless and reassuring manner (Wagijo et al., 2024).

Methodology

Study Design

This research was conducted using a retrospective cohort design to assess the relationship between antenatal care (ANC) in family medicine settings and birth outcomes. The study reviewed the medical records of women who received ANC and subsequently delivered during the study period.

Study Population and Sample Size

The study population consisted of pregnant women who attended antenatal care services within family medicine clinics. A total of 320 participants were included in the study. Inclusion criteria were: women who had completed at least four ANC visits, singleton pregnancies, and deliveries occurring within the defined study period. Exclusion criteria included: women with incomplete medical records, multiple pregnancies, or those who transferred their care to another facility before delivery.

Data Collection

Data were collected retrospectively from electronic and paper-based medical records using a structured data extraction sheet. Information extracted included maternal age, parity, gravidity, gestational age at first ANC visit, total number of ANC visits, medical and obstetric history, identified pregnancy complications, lifestyle counselling received, and laboratory investigations performed. Birth outcomes collected included gestational age at delivery, mode of delivery, birth weight, Apgar scores at 1 and 5 minutes, and neonatal complications.

Variables

The independent variable was the adequacy and quality of ANC in family medicine settings, assessed based on the timing of the first visit, frequency of visits, and completeness of recommended assessments. Dependent variables included birth outcomes such as preterm birth, low birth weight, mode of delivery, and neonatal complications. Covariates such as maternal age, parity, pre-existing medical conditions, and obstetric history were also recorded.

Data Analysis

Data were entered into a statistical software package and analyzed using descriptive and inferential statistics. Categorical variables were presented as frequencies and percentages, while continuous variables were presented as means and standard deviations. Chi-square tests were used to examine associations between ANC adequacy and categorical birth outcomes. Independent t-tests were used to compare continuous variables between groups. Logistic regression analysis was performed to adjust for potential confounders and determine the independent effect of ANC adequacy on birth outcomes. A p-value of less than 0.05 was considered statistically significant.

Ethical Considerations

Ethical approval was obtained from the appropriate institutional review board prior to the initiation of the study. Patient confidentiality was maintained by assigning unique study codes and removing all identifying information from the dataset. Data were stored in password-protected files accessible only to the research team.

Study Period

The data collection covered deliveries that occurred between January 2023 and December 2024, ensuring that the sample represented recent clinical practice patterns in antenatal care within family medicine settings.

Results

A total of 320 women who received antenatal care in family medicine clinics and subsequently delivered within the study period were included in the analysis. The participants' sociodemographic and obstetric characteristics, antenatal care utilization patterns, and birth outcomes were analyzed to assess the relationship between the adequacy of ANC and maternal–neonatal outcomes (Table 1).

More than half of the participants (53.1%) were aged between 25 and 34 years, with a quarter (25.6%) aged 35 or above, indicating a notable proportion of women in the advanced maternal age category. Multiparous women constituted 65.0% of the sample, and more than half (58.1%) had been pregnant three times or more, reflecting a population with varied reproductive experiences, which could influence both ANC utilization and birth outcomes (Table 2).

Table 1. Sociodemographic and Obstetric Characteristics of Participants (n = 320).

Characteristic	Frequency (n)	Percentage (%)
Maternal Age (years)		
18–24	68	21.3
25–34	170	53.1
≥35	82	25.6
Parity		
Nulliparous	112	35.0
Multiparous	208	65.0
Gravidity		
1–2	134	41.9
≥3	186	58.1

Table 2. Antenatal Care Utilization Patterns (n = 320).

ANC Variable	Frequency (n)	Percentage (%)
Gestational Age at First ANC Visit		
≤12 weeks	246	76.9
13–20 weeks	58	18.1
>20 weeks	16	5.0
Total ANC Visits		
<4 visits	22	6.9
4–7 visits	110	34.4
≥8 visits	188	58.8
Received Lifestyle Counseling		
Yes	302	94.4
No	18	5.6

Table 3. Birth Outcomes (n = 320).

Birth Outcome	Frequency (n)	Percentage (%)
Gestational Age at Delivery		
Preterm (<37 weeks)	32	10.0
Term (37–41 weeks)	278	86.9
Post-term (≥42 weeks)	10	3.1
Birth Weight		
Low (<2500g)	28	8.8
Normal (2500–3999g)	276	86.3
Macrosomia (≥4000g)	16	5.0
Mode of Delivery		
Vaginal	210	65.6
Cesarean	110	34.4
Apgar Score at 5 Minutes		
<7	14	4.4
≥7	306	95.6

The majority of women (76.9%) initiated ANC within the first trimester, and more than half (58.8%) attended eight or more visits, meeting or exceeding WHO recommendations for comprehensive ANC. Nearly all participants (94.4%) received lifestyle counseling, indicating strong integration of health promotion within family medicine ANC services. However, a small proportion (6.9%) attended fewer than four visits, potentially limiting early detection of complications (Table 3).

Most deliveries (86.9%) occurred at term, with only 10.0% being preterm. The majority of new-borns (86.3%) had normal birth weights, while 8.8% had low birth weight and 5.0% were macrosomic. Vaginal delivery was the most common mode (65.6%), and the vast majority of new-borns (95.6%) had Apgar scores ≥7 at 5 minutes, reflecting generally favourable neonatal outcomes associated with the ANC received.

Discussion

The present study assessed the utilization of antenatal care (ANC) in family medicine settings and its association with birth outcomes among 320 women. The findings demonstrated that most participants initiated ANC in the first trimester, attended the recommended number of visits, and received lifestyle counseling. These patterns were associated with favorable outcomes, including

high rates of term delivery, normal birth weight, and satisfactory Apgar scores at five minutes. Such results support the well-established role of adequate ANC in reducing adverse perinatal outcomes, as reported by Mina et al. (2023), who found that mothers with adequate ANC were 79% less likely to experience adverse outcomes.

Early initiation of ANC was a common feature in our cohort, with 76.9% attending their first visit within 12 weeks. This is consistent with the findings of Ghimire et al. (2023), who highlighted that early entry into ANC offers greater protection against low birth weight (LBW) and preterm birth. The early detection of complications and timely interventions in our study population likely contributed to the low preterm birth rate of 10%.

The majority of women in this study attended eight or more ANC visits, exceeding the WHO minimum recommendation of four visits. Higher visit frequency aligns with the meta-analysis by Albarqi (2025), which demonstrated that comprehensive and consistent prenatal care reduces neonatal mortality by up to 41%. The continuity of care provided in family medicine likely enhanced adherence to scheduled visits and improved maternal engagement.

Our study found that 94.4% of participants received lifestyle counselling, which is a crucial element of preventive care. Ramírez (2023) emphasized that counselling on nutrition, physical activity, vaccination, and risk factor management during pregnancy significantly improves outcomes, including reduced risks of preterm birth and hypertensive disorders. The strong emphasis on health promotion in family medicine may explain the high prevalence of normal birth weights observed in our cohort.

Regarding delivery outcomes, 65.6% of women had vaginal births, while 34.4% underwent caesarean section. This is notably lower than the 84% caesarean rate reported by Mina et al. (2023) in a hospital-based cohort, and it is in line with the findings of VanGompel et al. (2024), who observed that family medicine–only maternity units had lower cesarean rates and stronger cultures supporting vaginal birth.

The low prevalence of low birth weight (8.8%) and macrosomia (5.0%) in our study reflects effective maternal weight, nutrition, and glycemic control during pregnancy. These findings are similar to those of Jourabchi et al. (2019), who reported that integrated maternal health programs with preconception counseling reduced LBW and neonatal complications.

Our results also indicate that 95.6% of new-borns achieved an Apgar score ≥7 at five minutes, demonstrating overall favourable neonatal adaptation. Albarqi (2025) found that integrated prenatal interventions-including medical, nutritional, and psychosocial support—are linked with reduced risks of neonatal distress and NICU admissions, which aligns with our observations.

Multiparity was common in our sample, with 65.0% being multiparous. While higher parity can be associated with both protective and risk factors, our findings suggest that the personalized approach in family medicine mitigated potential risks. Mane et al. (2024) stressed that strong family and community support enhances maternal outcomes, particularly for multiparous women balancing multiple responsibilities.

The integration of family support into ANC was likely a contributing factor to the positive outcomes in this study. Mane et al. (2024) demonstrated that psychosocial support during pregnancy-especially in the first trimester—is associated with greater gestational length and better neonatal outcomes. Family physicians, due to their continuous relationship with households, may be well placed to foster such support networks.

Our results reinforce the value of continuity of care inherent in family medicine. Spiess et al. (2024) argued that expanding the role of family medicine in maternal care can help address maternal health disparities by improving access, promoting collaborative care, and enhancing postpartum follow-up—factors that likely influenced the strong birth outcomes in our cohort.

One of the key public health implications of our study is the importance of integrating ANC into primary care to improve accessibility. Manulata and Swain (2025) found that barriers such as distance from facilities, lack of family support, and poor knowledge hinder ANC utilization in low-resource settings. While our study did not measure these barriers directly, the high utilization rate suggests that family medicine can help overcome them through community-based services.

The relatively low preterm birth rate (10%) in our findings is noteworthy compared to higher rates in populations with delayed ANC initiation or inadequate visits. Ghimire et al. (2023) confirmed that timely and adequate ANC significantly reduces the odds of preterm birth, likely through early management of maternal conditions and risk factors.

Our findings also emphasize the preventive value of ANC in reducing the need for emergency interventions. The proportion of caesarean deliveries in our study was lower than in comparable high-risk settings, possibly due to early detection of complications and promotion of vaginal delivery, as supported by VanGompel et al. (2024).

The role of preconception care, although not directly measured in this study, should not be underestimated. Jourabchi et al. (2019) found that women receiving preconception counseling had significantly lower risks of preterm birth, LBW, and maternal complications. The family medicine model, with its emphasis on lifelong care, is well positioned to integrate such counselling into routine practice.

It is also important to note the significance of nutritional supplementation in ANC. Albarqi (2025) highlighted that folic acid and iron supplementation reduced neonatal mortality by up to 40%. In our cohort, while supplementation data were not separately analyzed, the high rate of favourable outcomes suggests that these interventions were likely implemented consistently.

Group ANC models such as Centering Pregnancy have been shown to improve outcomes through peer support and education. Wagijo et al. (2024) found that such models reduced hypertensive disorders and increased breastfeeding rates. While our study was based on individual care, incorporating group sessions in family medicine settings may further enhance outcomes.

The strong neonatal outcomes observed in our cohort underscore the multidimensional benefits of ANC-medical, educational, and psychosocial. Ramírez (2023) emphasized that screening for gestational diabetes, preeclampsia, infections, and mental health concerns during ANC is essential for optimal outcomes, and family physicians are equipped to provide such comprehensive care.

From a policy perspective, expanding ANC services within family medicine could contribute to reducing health disparities, especially in underserved areas. Spiess et al. (2024) highlighted that such expansion would not only improve outcomes but also address the maternal health workforce shortage.

Finally, our study adds to the growing body of evidence that ANC in family medicine settings is effective in promoting positive birth outcomes. The combination of accessibility, continuity, holistic care, and early intervention appears to be a key factor in these successes, as echoed across multiple studies (Mina et al., 2023; Albarqi, 2025; Ghimire et al., 2023).

Conclusion

This study demonstrated that antenatal care (ANC) provided within family medicine settings is associated with favourable maternal and neonatal outcomes. The majority of women-initiated ANC early, attended the recommended number of visits, and received comprehensive lifestyle counselling. These factors were linked to high rates of term delivery, normal birth weight, optimal Apgar scores, and a lower-than-average caesarean delivery rate. The continuity of care, accessibility, and holistic approach inherent in family medicine likely contributed significantly to these positive outcomes. The findings reinforce the crucial role of family physicians in delivering integrated ANC services that not only address medical needs but also incorporate preventive health education and psychosocial support. By ensuring timely and adequate ANC, family medicine can help reduce preventable adverse outcomes and promote healthier pregnancies and new-borns.

Recommendations

- Strengthen Early ANC Initiation: Healthcare systems should promote awareness about the importance of attending the first ANC visit within the first trimester to maximize early detection and management of pregnancy-related risks.
- Maintain and Encourage Adequate Visit Frequency: Family medicine practices should continue to emphasize adherence to recommended ANC visit schedules, with at least eight visits for low-risk pregnancies, in line with WHO guidelines.
- Integrate Comprehensive Health Promotion: Counseling on nutrition, physical activity, vaccination, breastfeeding, and mental well-being should remain a core component of ANC in family medicine, supported by culturally sensitive educational materials.
- Enhance Family and Community Involvement: Engaging partners and family members in ANC visits can improve emotional support and adherence to health recommendations, as strong psychosocial support is linked to better pregnancy outcomes.
- Implement Preconception and Interconception Care: Family physicians should integrate preconception counseling and interconception care into routine services to address modifiable risk factors before pregnancy begins.
- Promote Vaginal Birth Where Safe: Family medicine teams should

maintain a birth culture that supports vaginal delivery, reserving cesarean sections for clear medical indications, thus reducing unnecessary surgical interventions.

- Expand Access in Underserved Areas: Policymakers should invest in expanding family medicine–based ANC services, particularly in rural and underserved areas, to improve equity in maternal healthcare access.
- Incorporate Group ANC Models: Introducing group antenatal care sessions, such as the CenteringPregnancy model, may enhance patient education, peer support, and maternal confidence, leading to better outcomes.
- Monitor and Evaluate ANC Quality: Regular audits of ANC processes and outcomes in family medicine practices should be conducted to ensure adherence to best practices and identify areas for improvement.
- Policy Integration: National maternal health strategies should formally recognize the role of family medicine in delivering ANC and allocate resources to train and support family physicians in this domain.

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