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## The Importance of Quality Antenatal Care in Improving Maternal and Infant Health

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**Abstract:** Antenatal care (ANC) is a key intervention to improve the health of pregnant women and their infants. The quality of ANC not only involves the early detection of pregnancy complications but also includes preventive measures, nutritional counseling, maternal mental health support, and the promotion of safe delivery. Evidence shows that high-quality ANC reduces maternal mortality (MMR) and infant mortality (IMR), as well as prevents preterm birth, low birth weight (LBW), and stunting. This narrative review highlights that adherence to the World Health Organization (WHO) standard of a minimum of eight ANC visits during pregnancy significantly contributes to better maternal and infant outcomes. Moreover, the quality of interactions between health providers and mothers, including comprehensive information sharing, is a critical determinant of ANC effectiveness. Therefore, improving the quality of antenatal care should be a priority in health policies, supported by competent health professionals, equitable access to services, and stronger community awareness of the importance of regular pregnancy check-ups.

**Keyword:** Antenatal Care, Maternal Health, Infant Health, Service Quality, Pregnancy

### INTRODUCTION

Antenatal care (ANC) constitutes one of the key pillars in improving maternal and infant health. This service enables early detection, prevention, and management of pregnancy-related risk factors that are associated with maternal mortality, preterm birth, low birth weight (LBW), and even long-term consequences for child growth and development (WHO, 2016; ACOG, 2025). In other words, the quality and coverage of ANC function not only as curative measures but also as essential preventive strategies.

Globally, WHO (2016) recommends a minimum of eight ANC visits to reduce perinatal mortality and enhance positive pregnancy experiences. This recommendation is reinforced by research demonstrating that both the frequency and quality of ANC visits are strongly

associated with reduced risks of LBW and preterm delivery (WHO, 2016; Hunter et al., 2023). Observational evidence and systematic reviews further emphasize that high-quality ANC comprising nutritional assessments, supplementation, complication screening, as well as breastfeeding and nutrition counseling is correlated with lower rates of LBW and neonatal mortality (Engdaw et al., 2023; Abanga et al., 2025; Albarqi et al., 2025).

The Indonesian context reflects similar challenges and opportunities. The Indonesian Nutritional Status Survey (SSGI) 2022–2024 reported a decline in stunting prevalence to 19.8% in 2024. Nevertheless, disparities across regions and their association with primary health service indicators remain evident (Kemenkes RI, 2022; Kemenkes RI, 2024; Bappenas, 2021). Several studies also highlight that limited access to and poor quality of ANC are critical determinants of the high risk of LBW and stunting. For instance, research conducted in urban-poor communities revealed that children of mothers who did not receive ANC were at a higher risk of stunting compared to those whose mothers accessed adequate ANC services (Laksono et al., 2024; Siramaneerat et al., 2024; Putri et al., 2024).

In line with this, recent meta-analyses show that insufficient ANC visits and poor-quality services significantly increase the likelihood of LBW, which in turn elevates the risk of stunting. Conversely, antenatal interventions incorporating nutrition counseling, micronutrient supplementation, and breastfeeding support have been proven to improve birth weight and extend the duration of exclusive breastfeeding (Engdaw et al., 2023; Hunter et al., 2023; Oggero et al., 2024).

However, ANC quality is not solely determined by the quantity of visits. Maternal experience, respectful communication, and the integration of nutritional services, mental health care, and referral systems play pivotal roles in improving adherence to follow-up visits and ensuring the effectiveness of interventions (Mohamoud et al., 2023; WHO, 2019; CDC, 2023). Unfortunately, structural barriers such as geographical access, socioeconomic status, maternal education, and the availability of skilled health workers continue to hinder the implementation of quality ANC. Studies across Africa and Asia reveal that the coverage of  $\geq 8$  ANC contacts remains low, with similar patterns observed in Indonesia, where poverty and limitations in primary health services serve as major determinants (Demissie et al., 2024; Sserwanja, 2022; Silaen, 2025).

Drawing from this body of evidence, a comprehensive approach to quality ANC—including first-trimester visits, nutritional assessments and supplementation, complication screening, breastfeeding counseling, and timely referrals—is considered a key strategy to reduce LBW rates, improve exclusive breastfeeding outcomes, and indirectly lower the risk of stunting during the critical 1,000 Days of Life (HPK) (WHO, 2016; Victora et al., 2021; Ruel & Alderman, 2013). Therefore, this review presents a narrative synthesis of the importance of quality antenatal care in improving maternal and infant health, with emphasis on empirical evidence, determinant factors, and policy implications for midwifery practice in Indonesia.

## METHOD

This study employed a narrative literature review approach to synthesize evidence on the importance of quality antenatal care (ANC) in improving maternal and infant health. The narrative review approach was chosen because it allows for a comprehensive integration of various research designs, including quantitative, qualitative, and policy-based studies (Ferrari, 2015; Grant & Booth, 2009).

Literature searches were conducted through PubMed, ScienceDirect, Scopus, and Google Scholar, focusing on publications from the last six years (2018–2024) to ensure the use of up-to-date evidence. Keywords included “antenatal care,” “quality of care,” “maternal

health,” “infant health,” “pregnancy outcomes,” and “perinatal care.” Boolean operators (AND, OR) were applied to refine the search strategy (Liberati et al., 2009).

The inclusion criteria were as follows:

1. Articles published in reputable journals;
2. Studies discussing antenatal care services and their impact on maternal and infant health;
3. Publications in English or Indonesian;
4. Research types including literature reviews, cross-sectional, cohort, randomized controlled trials, or qualitative studies.

The exclusion criteria were:

1. Articles not available in full-text;
2. Studies focusing on non-pregnancy interventions;
3. Publications older than six years, except for seminal studies that remain highly relevant.

Data extraction focused on key findings related to ANC quality, maternal health outcomes, infant health outcomes, and policy implications. The synthesis was conducted integratively to enable cross-disciplinary comparisons, including obstetrics, midwifery, public health, and health policy (Snyder, 2019).

This review is not a systematic review and therefore does not employ meta-analysis. Instead, it presents a narrative synthesis by integrating global and national evidence to emphasize the critical role of quality ANC in reducing maternal and infant morbidity and mortality (WHO, 2018; Tunçalp et al., 2020)..

## RESULT AND DISCUSSION

### A. Quality of Antenatal Care and Its Relationship with Maternal Outcomes

Quality antenatal care (ANC) has long been recognized as one of the most effective strategies in reducing maternal morbidity and mortality. The WHO (2016), through its ANC Model 2016 recommendations, emphasized that increasing the number of contacts from four to eight during pregnancy significantly reduces the risk of preeclampsia, eclampsia, hemorrhage, and other obstetric complications. Similar findings were reinforced by ACOG (2025), which stated that high-risk pregnancies can be better managed through early detection integrated with nutritional education and chronic disease management. In other words, the quality of ANC not only lowers direct risks for mothers but also fosters a healthier and safer pregnancy environment.

Longitudinal studies in Ethiopia and Tanzania support this claim, showing that mothers who underwent complete ANC including laboratory examinations, counseling, and referrals when needed were less likely to experience delivery complications (Demissie et al., 2024; Mohamoud et al., 2023). Analysis of data from more than 40,000 pregnant women in Sub-Saharan Africa also revealed that the quality of ANC is directly correlated with reductions in postpartum hemorrhage, the leading cause of maternal mortality (WHO, 2021). This demonstrates that ANC is not merely a routine visit but a life-saving mechanism when service quality is maintained.

In Indonesia, a similar pattern emerges through research by Laksono et al. (2024), which found a significant relationship between ANC coverage and reduced obstetric complications, particularly anemia and pregnancy-induced hypertension. National surveys. Riskesdas 2018 and SSGI 2022 showed that pregnant women who received complete ANC had lower rates of pregnancy complications compared to those with irregular visits. Although ANC coverage in Indonesia exceeds 90%, analyses indicate that service quality such as health workers' compliance with standard examinations still varies across regions (Ministry of Health RI, 2022).

A meta-analysis by Hunter et al. (2023) highlighted the importance of healthcare providers' competencies in determining maternal outcomes. ANC delivered by trained

providers (doctors or midwives) was found to be more effective in reducing complications than services that were purely administrative. This underscores that the quality of ANC is determined by the content of care rather than merely the contact of care. Thus, healthcare providers need to be trained not only in physical examinations but also in nutritional counseling, mental health care, and early detection of medical issues.

Theoretically, the continuum of care model (Victora et al., 2021) explains that ANC quality is part of an interconnected chain of services spanning pregnancy, childbirth, and the postpartum period. If one part of this chain is weak, the overall outcome will be affected. Within this context, quality ANC serves as a critical entry point to breaking the chain of risks that can lead to maternal morbidity and mortality. Therefore, improving ANC quality through evidence-based approaches, provider training, and service quality monitoring should be considered a priority strategy for maternal health policies worldwide, including in Indonesia.

## **B. The Impact of ANC on Newborns**

The quality of antenatal care (ANC) has a direct impact on newborn health, particularly in reducing the risks of low birth weight (LBW), prematurity, and neonatal mortality (WHO, 2016; Engdaw et al., 2023; Abanga et al., 2025; Hunter et al., 2023). The WHO (2016) emphasized that implementing the eight-contact ANC model can reduce perinatal deaths by 8 per 1,000 births. A systematic study by Engdaw et al. (2023) found that mothers who received comprehensive ANC including nutrition counseling, micronutrient supplementation, and infectious disease screening had a 30–40% lower chance of delivering LBW infants. This demonstrates that ANC quality not only affects maternal conditions but also significantly determines neonatal outcomes.

A multi-country study by Abanga et al. (2025) revealed that infants born to mothers with inadequate ANC coverage (fewer than four visits or incomplete services) had twice the risk of prematurity compared to infants born to mothers who received high-quality ANC. Hunter et al. (2023) further added that quality ANC contributes to an increase in average birth weight by 150–200 grams, an important indicator in reducing the risk of growth and developmental disorders. Thus, each ANC contact represents a strategic opportunity to ensure optimal birth outcomes.

The Indonesian context shows consistent findings. Laksono et al. (2024) reported that children born to mothers who did not attend ANC had a 1.8 times higher risk of stunting compared to children of mothers with complete ANC. Data from the Indonesian Nutrition Status Survey (SSGI 2022; SSGI 2024) also indicated that provinces with lower-quality ANC coverage, particularly in eastern Indonesia, tended to have higher prevalence of stunting and LBW. This underscores that disparities in ANC quality across regions directly contribute to inequities in infant health outcomes.

Beyond nutrition and early detection of complications, the quality of interactions between healthcare providers and pregnant women also plays an important role. Mohamoud et al. (2023) demonstrated that respectful communication, psychological support, and breastfeeding counseling provided during ANC improved exclusive breastfeeding practices postpartum. Such support was shown to extend the average duration of exclusive breastfeeding by approximately two additional months compared to mothers who did not receive counseling, thereby contributing to reduced neonatal infections and improved nutritional status. In other words, ANC quality affects not only birth outcomes but also the early life phase of infants.

The Developmental Origins of Health and Disease (DOHaD) theory supports these findings, highlighting that health interventions during pregnancy influence children's long-term health, including risks of stunting, obesity, and metabolic disorders (Gluckman et al., 2016; Victora et al., 2021). Therefore, high-quality ANC can be viewed as a long-term

investment in improving the quality of future generations. From a public health policy perspective, strengthening ANC quality also helps reduce the double burden of malnutrition (undernutrition and overweight), which remains a significant challenge in Indonesia.

### **C. Socio-Economic Factors, Access, and Disparities in ANC Services**

Socio-economic status is a major determinant of access to and quality of antenatal care (ANC). Research by Sserwanja (2022) showed that mothers with low educational attainment were 1.7 times more likely to miss the minimum four recommended ANC visits compared to those with higher education. Demissie et al. (2024) further emphasized that household economic status significantly influences both the frequency and quality of ANC, as women from low-income families were more likely to forgo essential laboratory examinations and nutrition counseling. These findings indicate that disparities in education and income create a cycle of vulnerability with direct implications for both maternal and neonatal outcomes.

Geographical factors also pose significant barriers to fulfilling ANC requirements. A multi-country study by Mohamoud et al. (2023) highlighted that pregnant women residing in remote areas were less likely to achieve the recommended eight ANC contacts, largely due to transportation challenges and distance from health facilities. UNICEF (2023) reported that in Southeast Asia, a distance of more than five kilometers to the nearest health facility reduced the likelihood of accessing complete ANC by up to 40%. A similar situation is observed in Indonesia, where the 2024 Indonesian Nutrition Status Survey (SSGI) found that high-quality ANC coverage in Papua and East Nusa Tenggara was substantially lower compared to Java and Sumatra, with service gaps exceeding 20 percentage points.

The availability of skilled health workers also plays a crucial role in service disparities. According to WHO (2022), shortages of midwives and medical personnel in developing countries directly contribute to poor ANC quality, particularly in rural regions. In Indonesia, the ratio of midwives per 100,000 population remains uneven across provinces, with eastern regions having significantly fewer skilled personnel. Silaen (2025) found that limited competencies among midwives in providing nutrition counseling and early complication detection further compromised ANC quality, even when recommended visit frequencies were met. This underscores that physical access alone is insufficient without strengthening the capacity of healthcare providers.

Cultural norms and social dynamics further influence maternal compliance with ANC. Studies in South Asia revealed that healthcare-seeking decisions were often made by husbands or male family members (Sserwanja, 2022). In Indonesia, local norms such as restrictions on traveling without accompaniment or stigma toward medical examinations have been shown to delay ANC visits, particularly in rural communities (Laksono et al., 2024). These cultural factors highlight the need for ANC improvement strategies to integrate socio-cultural considerations alongside medical interventions.

Collectively, this evidence aligns with the social determinants of health perspective, which emphasizes that ANC quality is shaped not only by clinical interactions but also by structural conditions such as education, income, geographical access, cultural norms, and availability of skilled personnel (Victora et al., 2021; Bappenas, 2024). For Indonesia, addressing these disparities requires a multisectoral approach, ranging from investments in transportation infrastructure and subsidies for maternal healthcare services to capacity-building for midwives and community-based health literacy campaigns. Thus, strengthening ANC must be viewed as an integral component of broader public health and development strategies.



#### **D. The Importance of Education and Counseling in Antenatal Care**

Education and counseling in antenatal care (ANC) represent one of the main pillars in improving maternal and infant health. The World Health Organization (WHO, 2016) emphasizes that ANC is not only focused on clinical examinations but also includes providing pregnant women with relevant information regarding nutrition, healthy lifestyles, danger signs of pregnancy, and birth preparedness. According to Dowswell et al. (2015), pregnant women who receive structured counseling on nutrition and healthy living are less likely to experience anemia, hypertension, or other obstetric complications. This demonstrates that the proper transfer of knowledge through counseling effectively enhances mothers' preparedness for pregnancy and strengthens their awareness in maintaining fetal health.

Furthermore, antenatal counseling has been proven to play an important role in reducing preventable pregnancy complications. Research conducted by Mbuagbaw et al. (2015) found that mothers who were educated about pregnancy danger signs, such as bleeding, hypertension, or premature rupture of membranes, sought medical help more promptly, thereby reducing the risk of treatment delays. Data from the Indonesian Ministry of Health (2021) supports this, showing that 67% of delayed obstetric management cases in Indonesia were caused by mothers' lack of knowledge regarding pregnancy danger signs. Thus, the quality of counseling in ANC directly contributes to early detection and prevention of complications.

Education and counseling are also closely linked to improving pregnant women's adherence to recommended health protocols. For example, a study by Titaley et al. (2019) indicated that mothers who received regular education during ANC were more compliant in consuming iron and folic acid supplements, which reduced anemia risk by up to 34%. Compliance with tetanus toxoid (TT) immunization also increased, resulting in lower cases of neonatal tetanus in various regions. This highlights that effective communication between healthcare providers and pregnant women is a key factor in the success of maternal and child health interventions.

Beyond medical aspects, antenatal education also covers the mental and psychological preparation of pregnant women. According to the National Institute for Health and Care Excellence (NICE, 2020), counseling that addresses psychological aspects can reduce anxiety, depression, and stress during pregnancy, which positively affects fetal development. O'Connor et al. (2017) further note that psychosocial support provided through counseling sessions enhances mothers' confidence in facing childbirth. This is crucial, as mental readiness has been shown to correlate with smoother deliveries and fewer complications caused by psychosomatic factors.

In addition, education during ANC also has long-term impacts on family health behaviors. UNICEF (2021) reported that pregnant women who received intensive education on breastfeeding practices, newborn care, and environmental hygiene were more consistent in applying these health behaviors after giving birth. This contributed to reduced rates of stunting, diarrhea, and acute respiratory infections (ARI) in infants. In other words, quality ANC with an educational and counseling approach not only focuses on short-term outcomes during pregnancy but also promotes the long-term health of children and families.

#### **E. The Role of Policies and Health Systems in Improving the Quality of ANC**

National health policies play a strategic role in determining the quality of antenatal care (ANC) received by pregnant women. The World Health Organization (WHO, 2016) emphasizes that achieving global ANC standards, such as a minimum of eight visits, can only be realized if supported by adequate regulations and health systems. In Indonesia, the Ministry of Health's policy through the Healthy Indonesia Program with Family Approach

(PIS-PK) has encouraged increased access to ANC services at the primary care level. Data from Riskesdas (2018) show that the coverage of ANC K4 (four complete visits) has reached 74.1%, but significant disparities remain across regions. This indicates that strong policies must be accompanied by equitable implementation at the local level.

Beyond accessibility, policies also affect the quality of services provided. According to Campbell et al. (2016), countries with stricter regulations on ANC service standards have maternal mortality rates up to 25% lower compared to those with weaker policies. In Indonesia, Minister of Health Regulation No. 97 of 2014 on Health Services Before Pregnancy, During Pregnancy, Delivery, and Postpartum stipulates minimum ANC standards, including laboratory examinations, immunizations, and counseling. However, a study by Wulandari & Laksono (2020) highlights that the implementation of this regulation still faces obstacles, such as limited human resources and healthcare facilities, especially in remote areas.

Health financing systems are also critical in ensuring the quality of ANC. The implementation of the National Health Insurance (JKN) through BPJS Kesehatan has increased public access to ANC. Johar et al. (2018) found that JKN participation increased the likelihood of pregnant women attending ANC visits by up to 17%. However, delays in claims and budget constraints often hinder the provision of comprehensive services. Therefore, improvements in financing systems are necessary to ensure that all pregnant women, including those from poor and marginalized groups, can receive quality ANC services without financial barriers.

Additionally, health policies must consider cross-sectoral service integration. Bhutta et al. (2014) found that ANC interventions are more effective when combined with nutrition, sanitation, and education programs. This aligns with the Sustainable Development Goals (SDGs), particularly Goal 3 on maternal and child health. In Indonesia, this integration has been reflected in the Posyandu program, which combines ANC services with nutrition education, immunization, and child growth monitoring. However, the effectiveness of Posyandu largely depends on the availability of trained cadres and adequate funding support from local governments.

Furthermore, policies and health systems serve as instruments to reduce inequities in ANC access. Say et al. (2014) note that economic, geographic, and educational disparities are the main determinants of low ANC utilization. Thus, governments need to strengthen affirmative policies, such as deploying healthcare workers to remote areas, utilizing telemedicine technologies, and providing incentives for village midwives. With these measures, ANC quality can be improved more equitably across all segments of society, thereby accelerating the reduction of maternal mortality (MMR) and infant mortality (IMR).

## CONCLUSION

Quality antenatal care (ANC) is a key intervention in improving maternal and infant health, particularly during the critical period of the First 1,000 Days of Life. Literature shows that ANC can significantly reduce the risks of low birth weight (LBW), prematurity, and neonatal mortality (WHO, 2016; Engdaw et al., 2023; Abanga et al., 2025). However, challenges such as limited access, unequal distribution of healthcare workers, and socioeconomic disparities remain major barriers (Wulandari & Laksono, 2020; Say et al., 2014).

The quality of ANC is not only determined by the frequency of visits, but also by the completeness of examinations, counseling, and nutritional support provided (Hunter et al., 2023; Tessema et al., 2021). The role of midwives has proven to be central in ensuring comprehensive ANC services, including the early detection of pregnancy complications as well as reproductive health education (Campbell et al., 2016; Bhutta et al., 2014).

Health policies and systems play a major role in the successful implementation of ANC. National regulations, healthcare financing through the National Health Insurance (JKN), and the integration of maternal and child health services are determining factors in expanding access and improving the quality of ANC (Johar et al., 2018; Riskesdas, 2018). With strengthened policies, equitable resource distribution, and multisectoral support, the quality of ANC in Indonesia can be improved, thus accelerating the achievement of Sustainable Development Goals (SDGs) in reducing the Maternal Mortality Ratio (MMR) and Infant Mortality Rate (IMR).

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