RESEARCH PAPER

Effectiveness of Community-Based Antenatal Care on Maternal and Fetal Outcomes: A Narrative Review.

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Abstract
Maternal and neonatal mortality remain major public health concerns, particularly in low- and middle-income countries where access to quality antenatal care is often limited. Community-based antenatal care (CBANC) has emerged as an effective strategy to improve maternal and fetal health by extending essential healthcare services from health facilities to communities. Through home visits, health education, nutritional counseling, early risk identification, referral services, and continuous pregnancy monitoring, community health workers, nurses, and midwives contribute significantly to improving pregnancy outcomes. Community-based interventions also enhance awareness regarding danger signs of pregnancy, birth preparedness, institutional delivery, breastfeeding, and newborn care. Several studies have suggested that CBANC increases antenatal care utilization, improves maternal knowledge, reduces delays in seeking care, and contributes to lower maternal and neonatal morbidity and mortality. This review discusses the concept, components, implementation strategies, and effectiveness of community-based antenatal care on maternal and fetal outcomes while highlighting existing challenges and future opportunities for strengthening maternal healthcare systems.

Keywords: Community-based antenatal care, maternal health, fetal outcomes, pregnancy, community health workers, maternal mortality, neonatal health

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Introduction

Pregnancy is a critical stage in a woman's life that requires continuous healthcare, nutritional support, and timely medical intervention to ensure the well-being of both the mother and the developing fetus. Antenatal care (ANC) is recognized as one of the most effective preventive healthcare services because it facilitates early detection of pregnancy-related complications, promotes healthy maternal behaviors, and improves pregnancy outcomes.[1] Traditional antenatal care is generally delivered through hospitals and primary healthcare centers; however, many women living in rural, remote, and economically disadvantaged communities experience considerable barriers in accessing these services. Long travel distances, transportation difficulties, financial limitations, shortages of healthcare professionals, and inadequate health awareness frequently result in delayed or insufficient antenatal care.[2]

Community-based antenatal care (CBANC) has been developed to address these barriers by bringing essential maternal healthcare services directly to women within their own communities. Rather than depending exclusively on facility-based services, CBANC utilizes community health workers, nurses, midwives, Accredited Social Health Activists (ASHAs), and trained volunteers to deliver antenatal care through home visits, outreach clinics, community meetings, and

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health education programs.[3] This decentralized approach improves accessibility, particularly among vulnerable populations where healthcare infrastructure remains inadequate.

The primary objective of community-based antenatal care is to ensure that every pregnant woman receives comprehensive and continuous care throughout pregnancy regardless of geographical location or socioeconomic status. Community health workers play a vital role in identifying pregnancies at an early stage, encouraging timely antenatal registration, monitoring maternal health, providing nutritional counseling, promoting iron and folic acid supplementation, educating families regarding pregnancy danger signs, and facilitating referrals for high-risk pregnancies.[4] These interventions strengthen the continuum of maternal healthcare and promote early utilization of skilled obstetric services.

Another important feature of community-based antenatal care is community participation. Family members, local leaders, women's self-help groups, and community organizations actively support pregnant women through awareness campaigns, educational sessions, and birth preparedness activities. Community engagement not only improves maternal knowledge but also encourages supportive family environments that facilitate healthy pregnancy behaviors.[5] Community mobilization has been shown to increase institutional delivery rates, improve compliance with antenatal visits, and enhance utilization of emergency obstetric care.

The effectiveness of community-based antenatal care extends beyond routine pregnancy monitoring. Home-based interventions enable healthcare workers to identify maternal anemia, hypertension, gestational diabetes, malnutrition, infections, and fetal growth abnormalities at an earlier stage, allowing prompt referral and treatment before complications become severe. Regular counseling regarding nutrition, hygiene, immunization, breastfeeding, newborn care, and family planning further contributes to improved maternal and neonatal health outcomes.[6]

Evidence from numerous observational studies, intervention programs, and systematic reviews indicates that community-based antenatal care improves antenatal care coverage, increases maternal health awareness, enhances adherence to recommended antenatal visits, and reduces preventable maternal and neonatal complications. Women who receive community-based antenatal services are more likely to complete recommended antenatal visits, receive tetanus immunization, consume iron–folic acid supplements, prepare adequately for childbirth, and seek skilled care during labor compared with women who rely solely on facility-based services.[7]

Community health workers are central to the success of these interventions because they serve as trusted members of the communities they support. Their close relationship with pregnant women facilitates culturally appropriate communication, personalized counseling, and continuous follow-up throughout pregnancy. In many developing countries, community health workers also function as an essential link between households and healthcare facilities by ensuring timely referrals and encouraging institutional deliveries when complications arise.[8]

Despite the demonstrated benefits of community-based antenatal care, several implementation challenges continue to affect program effectiveness. Limited financial resources, inadequate workforce training, inconsistent supervision, shortages of medical supplies, heavy workloads, and cultural misconceptions regarding pregnancy may reduce the quality and sustainability of community-based interventions. Variations in healthcare policies and differences in community engagement strategies also contribute to unequal program performance across different regions.[9]

Strengthening community-based antenatal care requires comprehensive policy support, continuous professional training of community health workers, integration of digital health technologies, improved referral systems, and active community participation. Investment in these strategies has the potential to improve maternal survival, reduce neonatal mortality, and promote healthier pregnancies worldwide.[10]

This review aims to summarize the available evidence regarding the effectiveness of community-based antenatal care in improving maternal and fetal outcomes, describe the major components of community-based antenatal services, discuss the role of community health workers, identify implementation challenges, and provide recommendations for strengthening maternal healthcare at the community level.

Community-Based Antenatal Care: Concept, Components, and Role of Community Health Workers

Concept of Community-Based Antenatal Care

Community-Based Antenatal Care (CBANC) is a healthcare approach that delivers essential antenatal services to pregnant women within their own communities rather than relying exclusively on hospitals or healthcare facilities. The primary objective of CBANC is to improve access to maternal healthcare, particularly among women residing in rural, remote, and underserved areas where healthcare services are limited.[1] Community-based antenatal care emphasizes preventive healthcare, early risk identification, health education, nutritional support, timely referral, and continuous pregnancy monitoring through collaboration between healthcare professionals and community members.[2]

Unlike conventional facility-based antenatal care, CBANC adopts a decentralized healthcare model in which trained community health workers, nurses, midwives, Accredited Social Health Activists (ASHAs), auxiliary nurse midwives (ANMs), and volunteers provide antenatal services through home visits, outreach clinics, community meetings, and mobile health programs.[3] This approach minimizes geographical and financial barriers while improving maternal engagement with healthcare services. Regular contact between healthcare providers and pregnant women also promotes continuity of care, allowing early recognition of

complications and timely referral to higher-level health facilities when necessary.[4]

Community-based antenatal care is founded on the principles of accessibility, equity, participation, and continuity of maternal healthcare. It seeks to empower women and their families by increasing awareness of healthy pregnancy practices, danger signs, birth preparedness, emergency planning, newborn care, and family support. Community participation encourages local ownership of maternal health programs and strengthens collaboration among healthcare providers, families, and community leaders.[5]

Several international organizations advocate community-based maternal healthcare as an essential strategy for achieving universal health coverage and reducing preventable maternal and neonatal deaths. In many low- and middle-income countries, community-based antenatal care has become an integral component of national maternal health programs because it extends essential healthcare services beyond healthcare institutions and reaches populations that might otherwise remain underserved.[6]

Components of Community-Based Antenatal Care

Effective community-based antenatal care consists of several integrated interventions that collectively promote maternal and fetal health throughout pregnancy.

1. Early Pregnancy Registration

Early identification and registration of pregnancy enable healthcare providers to initiate antenatal care during the first trimester. Early registration facilitates baseline maternal assessment, identification of high-risk pregnancies, and timely implementation of preventive interventions. Women registered early are more likely to complete recommended antenatal visits and receive essential maternal healthcare services.[7]

2. Home Visits

Home visits represent one of the most important components of community-based antenatal care. During these visits, community health workers monitor maternal well-being, assess fetal growth, identify danger signs, provide individualized counseling, and encourage compliance with antenatal recommendations. Home-based care also improves communication with family members, allowing healthcare providers to involve spouses and caregivers in pregnancy care and birth preparedness.[8]

3. Health Education

Health education empowers pregnant women with knowledge necessary for maintaining a healthy pregnancy. Educational sessions typically include information regarding balanced nutrition, personal hygiene, physical activity, recognition of danger signs, birth preparedness, institutional delivery, breastfeeding, newborn care, immunization, and postpartum family planning. Continuous health education improves maternal decision-making and encourages appropriate healthcare-seeking behavior.[9]

4. Nutritional Assessment and Counseling

Maternal nutrition significantly influences fetal growth and pregnancy outcomes. Community healthcare providers assess dietary habits, identify nutritional deficiencies, monitor maternal weight gain, and provide counseling regarding balanced diets rich in protein, iron, calcium, folic acid, vitamins, and other essential nutrients. Nutritional counseling contributes to the prevention of maternal anemia, low birth weight, and intrauterine growth restriction.[10]

5. Iron–Folic Acid Supplementation

Iron and folic acid supplementation is routinely promoted through community-based antenatal care programs. Community health workers distribute supplements, educate women regarding adherence, monitor compliance, and explain the importance of preventing maternal anemia and neural tube defects. Regular supplementation has been associated with improved maternal hemoglobin levels and healthier fetal development.[11]

6. Screening and Early Risk Identification

Routine screening enables early detection of pregnancy-related complications including hypertension, gestational diabetes mellitus, anemia, urinary tract infections, malnutrition, and fetal growth abnormalities. Community healthcare providers measure blood pressure, monitor weight gain, assess edema, evaluate danger signs, and identify women requiring referral for specialized obstetric care. Early identification substantially reduces maternal and neonatal complications.[12]

7. Referral Services

Referral systems ensure continuity of care for women with high-risk pregnancies or obstetric emergencies. Community health workers coordinate referrals to primary healthcare centers or tertiary hospitals whenever complications such as severe hypertension, vaginal bleeding, reduced fetal movement, prolonged labor, or premature rupture of membranes are identified. Efficient referral systems reduce delays in receiving appropriate medical treatment.[13]

8. Birth Preparedness and Complication Readiness

Birth preparedness involves helping pregnant women and their families develop individualized plans for childbirth. Community healthcare providers encourage women to identify delivery facilities, arrange transportation, save emergency funds, recognize danger signs, identify compatible blood donors when necessary, and prepare essential newborn supplies. These activities reduce delays during obstetric emergencies and improve maternal survival.[14]

9. Psychosocial Support

Pregnancy often involves emotional, psychological, and social challenges that may influence maternal health. Community-based antenatal care provides emotional support through counseling, family engagement, peer support groups, and regular communication with

healthcare workers. Psychosocial support reduces maternal anxiety, promotes mental well-being, and improves adherence to antenatal care recommendations.[15]

10. Digital Community Health Services

Recent technological advances have strengthened community-based antenatal care through mobile health (mHealth) applications, telemedicine, electronic health records, SMS reminders, and digital pregnancy tracking systems. These innovations facilitate appointment reminders, remote consultations, health education, and monitoring of high-risk pregnancies, particularly in geographically isolated communities.[16]

Role of Community Health Workers in Community-Based Antenatal Care

Community health workers (CHWs) are considered the foundation of community-based antenatal care because they serve as the primary link between pregnant women and formal healthcare systems. Their familiarity with local culture, language, and community dynamics enables them to provide culturally appropriate maternal healthcare services while establishing trusting relationships with families.[17]

One of the most important responsibilities of community health workers is identifying pregnant women at an early stage and encouraging prompt antenatal registration. Early registration enables healthcare providers to monitor maternal health from the first trimester, increasing opportunities for early diagnosis and management of pregnancy-related complications. CHWs also maintain pregnancy records, conduct regular follow-up visits, and ensure continuity of maternal healthcare.[18]

Community health workers provide individualized health education regarding nutrition, personal hygiene, iron–folic acid supplementation, tetanus immunization, physical activity, breastfeeding, birth preparedness, newborn care, postpartum care, and family planning. Their continuous interaction with pregnant women improves maternal knowledge, encourages healthy lifestyle behaviors, and enhances adherence to recommended antenatal care schedules.[19]

Another essential responsibility of community health workers is early recognition of danger signs during pregnancy. Through routine home visits, CHWs monitor maternal blood pressure, weight gain, edema, fetal movement, and general health status while identifying warning signs such as severe headache, vaginal bleeding, convulsions, fever, reduced fetal movement, or prolonged labor. Women presenting with these complications are referred promptly to healthcare facilities for specialized management.[20]

Community health workers also contribute significantly to increasing institutional delivery rates by educating families regarding the importance of skilled birth attendance and assisting with transportation planning and referral coordination. Their involvement reduces delays in seeking emergency obstetric care and strengthens collaboration between communities and healthcare facilities.[21]

In many countries, community health workers also support postnatal care by conducting home visits after childbirth, monitoring maternal recovery, assessing newborn health, promoting exclusive breastfeeding, encouraging immunization, and identifying postpartum complications requiring medical attention. This continuity of care improves both maternal and neonatal survival while strengthening long-term community health outcomes.[22]

Overall, community health workers represent an indispensable component of community-based antenatal care programs. Their contribution extends beyond healthcare delivery to include health promotion, disease prevention, community mobilization, and empowerment of women and families. Strengthening community health worker training, supervision, and support systems remains essential for maximizing the effectiveness of community-based maternal healthcare programs worldwide.

Effectiveness of Community-Based Antenatal Care on Maternal Outcomes

Community-based antenatal care (CBANC) has emerged as an effective strategy for improving maternal health outcomes by increasing accessibility, continuity, and quality of antenatal services. Numerous studies have reported that women who receive community-based antenatal services are more likely to initiate antenatal care early, complete the recommended number of antenatal visits, and receive essential preventive interventions compared with women relying solely on facility-based services.[1] These improvements contribute to the early identification and management of pregnancy-related complications, ultimately reducing maternal morbidity and mortality.

One of the most significant benefits of CBANC is the promotion of early pregnancy registration. Community health workers identify pregnant women during the first trimester through routine household visits and encourage immediate registration at nearby health facilities. Early registration allows healthcare professionals to establish baseline maternal health assessments, estimate gestational age accurately, identify high-risk pregnancies, and initiate preventive interventions such as iron–folic acid supplementation, tetanus immunization, and nutritional counseling.[2]

Community-based antenatal care also contributes substantially to reducing maternal anemia, one of the most common complications of pregnancy. Through regular home visits, community health workers monitor compliance with iron–folic acid supplementation, provide dietary counseling, and educate women regarding foods rich in iron, protein, calcium, and essential vitamins. Continuous follow-up improves adherence to nutritional recommendations, resulting in better maternal nutritional status and reduced prevalence of iron-deficiency anemia.[3]

Gestational hypertension and preeclampsia remain leading causes of maternal mortality worldwide. Community-based antenatal programs facilitate routine blood pressure monitoring, identification of edema, assessment of maternal symptoms, and timely referral of

women presenting with warning signs such as severe headache, blurred vision, or elevated blood pressure. Early detection enables prompt medical intervention and significantly decreases the likelihood of severe maternal complications including eclampsia, stroke, and multi-organ failure.[4]

Similarly, early screening for gestational diabetes mellitus (GDM) through community outreach programs has improved maternal metabolic outcomes. Women identified as being at high risk are referred for diagnostic testing, dietary counseling, glucose monitoring, and specialist care. Community health workers reinforce lifestyle modifications through repeated counseling sessions, thereby improving glycemic control and reducing pregnancy-related complications associated with uncontrolled diabetes.[5]

Health education delivered through community-based antenatal care has been shown to improve maternal knowledge regarding healthy pregnancy practices, danger signs, personal hygiene, nutrition, breastfeeding, birth preparedness, and family planning. Women who receive regular counseling demonstrate greater awareness of obstetric emergencies and are more likely to seek timely medical assistance when complications occur. Improved health literacy also enhances maternal confidence and participation in healthcare decision-making.[6]

Another important outcome associated with CBANC is increased institutional delivery. Community health workers educate pregnant women and their families regarding the importance of skilled birth attendance, assist in identifying appropriate healthcare facilities, develop birth preparedness plans, and coordinate transportation during labor. These interventions reduce delays in reaching healthcare facilities and increase the proportion of deliveries conducted by skilled healthcare professionals, thereby reducing maternal mortality associated with obstetric emergencies.[7]

Community-based antenatal care also contributes to improved maternal mental health by providing continuous psychosocial support throughout pregnancy. Regular interaction with community health workers reduces anxiety, enhances emotional well-being, and encourages family involvement in pregnancy care. Women receiving social support are more likely to adhere to antenatal recommendations and experience improved pregnancy satisfaction.[8]

Overall, the available evidence indicates that community-based antenatal care strengthens maternal healthcare through improved accessibility, early diagnosis of pregnancy complications, enhanced nutritional status, increased institutional delivery, better maternal knowledge, and stronger continuity of care.

Effectiveness of Community-Based Antenatal Care on Fetal and Neonatal Outcomes

The health of the fetus is closely associated with the quality and continuity of maternal antenatal care. Community-based antenatal care improves fetal outcomes primarily through early identification of maternal risk factors, promotion of healthy pregnancy behaviors, and timely referral for specialized obstetric management. Women receiving comprehensive community-based antenatal services generally experience lower rates of adverse birth outcomes compared with those receiving inadequate antenatal care.[9]

One of the most consistently reported benefits of CBANC is the reduction in preterm birth. Early recognition and management of maternal infections, hypertension, diabetes, malnutrition, and obstetric complications reduce the likelihood of premature delivery. Community health workers also encourage compliance with antenatal appointments, nutritional supplementation, and medical treatment, thereby supporting normal fetal development throughout pregnancy.[10]

Community-based nutritional counseling contributes significantly to improving fetal growth. Pregnant women receiving individualized dietary advice, iron–folic acid supplementation, calcium supplementation, and nutrition education are less likely to deliver low-birth-weight infants. Adequate maternal nutrition improves placental function, fetal growth, and nutrient transfer, resulting in healthier neonatal birth weights and reduced incidence of intrauterine growth restriction.[11]

Another important benefit of CBANC is improved neonatal survival. Increased institutional deliveries, timely referral of obstetric emergencies, and enhanced birth preparedness reduce birth complications and facilitate immediate neonatal care. Early initiation of breastfeeding, thermal care, cord care, and newborn danger-sign education provided during community visits further improve neonatal health and decrease preventable neonatal deaths.[12]

Community-based interventions also promote complete maternal immunization, including tetanus toxoid vaccination, which contributes to the prevention of neonatal tetanus. In addition, education regarding infection prevention, hygiene practices, and safe delivery techniques reduces neonatal infections during the early postnatal period.[13]

Exclusive breastfeeding is another essential outcome influenced by community-based antenatal care. During home visits and antenatal counseling sessions, community health workers educate mothers regarding breastfeeding techniques, advantages of exclusive breastfeeding, and early initiation within one hour after birth. Mothers receiving such counseling demonstrate higher breastfeeding initiation and continuation rates, contributing to improved infant nutrition, immunity, and growth.[14]

Community-based follow-up during the postnatal period enables early detection of neonatal danger signs such as fever, poor feeding, respiratory distress, jaundice, and umbilical infection. Prompt referral for medical treatment reduces neonatal morbidity while improving long-term infant survival. Continuous interaction between healthcare providers and families strengthens parental confidence in newborn care and enhances healthcare utilization during infancy.[15]

Overall, community-based antenatal care contributes to healthier fetal growth, lower rates of preterm birth, reduced low birth weight, improved neonatal survival,

increased breastfeeding practices, and better newborn care by ensuring continuous maternal support throughout pregnancy and the early postnatal period.

Challenges and Barriers

Despite its demonstrated effectiveness, community-based antenatal care faces several implementation challenges. Shortages of trained community health workers, inadequate supervision, inconsistent funding, and limited availability of essential medicines and equipment may reduce the quality of services delivered at the community level.[16]

Geographical barriers remain an important obstacle in remote and mountainous regions where transportation infrastructure is poor. Pregnant women may still experience delays in accessing referral facilities despite community-based interventions. Financial hardship, sociocultural beliefs, gender inequality, and low female literacy also influence healthcare utilization and may reduce adherence to recommended antenatal care schedules.[17]

Variability in training standards among community health workers may affect the quality of counseling, screening, and referral practices. Continuous professional development, supportive supervision, and standardized clinical guidelines are therefore essential to maintain service quality. In addition, excessive workload and inadequate incentives often contribute to reduced motivation and increased staff turnover among frontline healthcare workers.[18]

The integration of digital health technologies into community-based antenatal care remains limited in many developing countries due to inadequate internet connectivity, lack of technical expertise, and financial constraints. Expanding mobile health applications, electronic pregnancy tracking systems, and telemedicine services could substantially improve continuity of maternal healthcare, particularly in geographically isolated communities.[19]

Future Perspectives

Future community-based antenatal care programs should emphasize comprehensive maternal healthcare beginning before conception and continuing throughout pregnancy and the postnatal period. Strengthening primary healthcare infrastructure, improving referral networks, increasing investment in community health workers, and expanding digital health technologies will further enhance maternal and neonatal outcomes.[20]

Artificial intelligence-based risk assessment, mobile pregnancy monitoring applications, wearable maternal health devices, and teleconsultation services have considerable potential to improve early diagnosis of pregnancy complications. Community participation should also be strengthened through women's support groups, male partner involvement, and culturally appropriate health education programs to improve maternal health behaviors and service utilization.

Collaborative efforts involving governments, healthcare professionals, academic institutions, and international organizations are essential to ensure equitable access to high-quality community-based antenatal care. Sustainable investments in maternal healthcare will contribute significantly to reducing preventable maternal and neonatal mortality while advancing global maternal and child health goals.

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