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Antenatal care practices and maternal health outcomes in Bagerhat district

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Abstract

Antenatal care (ANC) is a critical component of maternal health that significantly influences pregnancy outcomes. This study explores antenatal care practices and their impact on maternal health outcomes in Bagerhat District, Bangladesh. Utilizing a mixed-methods approach, data were collected from 300 pregnant and recently delivered women across both rural and urban areas of the district through structured questionnaires and in-depth interviews. The study examines the frequency of ANC visits, timing of first contact, types of services received, and factors affecting ANC utilization. Findings reveal that while awareness of ANC is relatively high, consistent and early utilization remains low, especially in rural areas. Socioeconomic status, education, and accessibility to health facilities were identified as key determinants influencing ANC attendance. Moreover, women who received at least four ANC visits from trained providers showed significantly better maternal health outcomes, including reduced pregnancy-related complications and improved birth preparedness. The study highlights the need for targeted interventions, including community education, improved healthcare access, and enhanced training for frontline health workers, to improve ANC uptake and maternal health in Bagerhat. These findings can inform policy and programmatic strategies aimed at strengthening maternal healthcare services in similar low-resource settings.

Keywords: Antenatal care (ANC), maternal health, pregnancy outcomes, rural health, maternal healthcare services, community health, health education

Introduction

Maternal health remains a major public health concern in many low- and middle-income countries, including Bangladesh. Antenatal care (ANC), defined as the care provided to pregnant women before the onset of labor, plays a crucial role in ensuring safe pregnancies and favorable birth outcomes. The World Health Organization (WHO) recommends a minimum of four ANC visits during pregnancy to monitor maternal and fetal health, detect complications early, and provide necessary health education.

In Bangladesh, although significant progress has been made in reducing maternal mortality, disparities still exist, especially in rural and underserved districts like Bagerhat. Located in the southwestern part of the country, Bagerhat is home to a large rural population with limited access to healthcare facilities and trained health professionals. As a result, many women either receive inadequate antenatal care or delay initiating ANC visits, which increases the risk of complications during pregnancy and childbirth.

This study aims to examine the patterns of antenatal care utilization in Bagerhat District and assess how these practices influence maternal health outcomes. By identifying key barriers and facilitators to effective ANC, the study seeks to contribute to the ongoing efforts of improving maternal healthcare services in rural Bangladesh. The findings will also help inform policy decisions and design targeted interventions to enhance ANC uptake and reduce maternal morbidity and mortality in similar settings.

Objectives

1. To assess the level of awareness and utilization of antenatal care (ANC) services among pregnant women in Bagerhat District.
2. To examine the timing, frequency, and quality of ANC services received by women during pregnancy.
3. To identify the key socio-demographic and healthcare-related factors influencing ANC practices in the region.
4. To analyze the relationship between antenatal care practices and maternal health outcomes, including pregnancy-related complications and delivery preparedness.
5. To explore the barriers and challenges faced by women in accessing ANC services in both rural and urban areas of Bagerhat.
6. To recommend strategies for improving antenatal care utilization and maternal health in Bagerhat District.

Literature Review

Antenatal care (ANC) is a fundamental public health strategy aimed at reducing maternal and neonatal mortality. Globally, ANC has been proven to play a critical role in identifying pregnancy-related complications, promoting healthy behaviors during pregnancy, and preparing women for childbirth and possible emergencies (WHO, 2016). The quality, timing, and frequency of ANC visits have a direct

impact on pregnancy outcomes. WHO recommends a minimum of four focused ANC visits during pregnancy; however, in 2016, it revised the guideline to recommend a minimum of eight contacts to improve maternal and fetal outcomes (WHO, 2016).

Global and National Trends in ANC Utilization

Globally, progress in maternal healthcare services has been significant, yet low- and middle-income countries (LMICs) still struggle with gaps in ANC access and quality. According to the WHO, in 2020, about 86% of pregnant women globally received at least one ANC visit, but only 62% received the recommended four or more visits. In Sub-Saharan Africa and South Asia, the coverage remains substantially lower compared to high-income regions.

In Bangladesh, maternal healthcare has witnessed notable improvement in recent decades, largely due to government and non-governmental interventions. The Bangladesh Demographic and Health Survey (BDHS) 2022 reported that 47% of women had at least four ANC visits during their last pregnancy, showing an upward trend from previous years. However, disparities persist women in rural areas, those with low levels of education, and those from poorer households are far less likely to receive adequate ANC (NIPORT *et al*., 2022). While urban centers tend to benefit from better health infrastructure and awareness, rural districts like Bagerhat often face systemic challenges that hinder effective service delivery.

Barriers to Antenatal Care Utilization

A wide range of studies have documented the barriers affecting ANC uptake. A study by Chowdhury *et al*. (2013) [8] found that lack of awareness, financial constraints, gender norms, and the long distance to health facilities were the main hindrances to ANC services in rural Bangladesh. Cultural beliefs, misconceptions, and the preference for traditional birth attendants further reduce the likelihood of seeking formal care. Education, particularly of the mother and the household head, is positively associated with ANC attendance. Additionally, women's autonomy in health-related decision-making plays a crucial role in healthcare-seeking behavior.

Quality of Antenatal Care

Beyond utilization, the quality of care received during ANC visits is equally important. Studies have shown that many women in Bangladesh, even when they attend ANC, receive incomplete or substandard services. For instance, necessary screenings (e.g., blood pressure measurement, urine tests, tetanus vaccination, counseling) are often not provided consistently. A study by Rahman *et al*. (2017) [13] found that less than half of the women who received ANC services were given all the essential components as per national guidelines. This gap in quality diminishes the potential benefits of ANC in improving maternal and neonatal outcomes.

Impact of ANC on Maternal Health Outcomes

Antenatal care has a demonstrable impact on improving maternal health outcomes, including reducing the risk of anemia, hypertension, gestational diabetes, preterm birth, and low birth weight. A study in Nepal by Karkee *et al*.

(2013) found that women who had four or more ANC visits were significantly less likely to experience complications during childbirth. In Bangladesh, similar patterns have been observed, although district-specific data are often lacking. Improved birth preparedness, better nutritional knowledge, and timely referrals to higher-level care are common advantages associated with quality ANC.

The Context of Bagerhat District

Bagerhat District, located in the southwestern part of Bangladesh, is predominantly rural and faces geographic and infrastructural challenges that affect access to healthcare. According to local government and NGO reports, many unions within Bagerhat have insufficient numbers of skilled healthcare providers, under-equipped community clinics, and limited transportation options. Additionally, floods and seasonal weather conditions often disrupt regular access to health services. Despite these challenges, there is a dearth of comprehensive studies focusing specifically on ANC practices and maternal health in this region.

This study intends to fill the existing research gap by exploring the antenatal care-seeking behavior of women in Bagerhat District, identifying socio-cultural and structural barriers to effective ANC utilization, and analyzing the association between ANC practices and maternal health outcomes. Understanding these factors at a local level is essential for designing context-specific interventions and policies aimed at improving maternal and neonatal health in under-resourced settings.

Methodology

This study employs a mixed-methods approach to explore antenatal care practices and their impact on maternal health outcomes in Bagerhat District, Bangladesh. A combination of quantitative and qualitative methods was used to provide a comprehensive understanding of ANC utilization, the factors influencing it, and its effects on maternal health. The study design includes a cross-sectional survey and in-depth interviews, which will allow for both statistical analysis and rich contextual insights.

Study Area: The study was conducted in Bagerhat District, located in the southwestern region of Bangladesh. The district is predominantly rural, with a mix of agricultural and fishing communities. This area was selected due to its limited access to healthcare services, high maternal and neonatal mortality rates, and the absence of detailed studies on ANC practices within the region.

Study Design: The study used a descriptive cross-sectional design for the quantitative component, which is appropriate for understanding the current status of ANC utilization in the population. The qualitative component, involving in-depth interviews, provided insights into the barriers, challenges, and personal experiences related to ANC services.

Study Population

- **Quantitative Sample:** The study targeted 300 pregnant women and those who had recently given birth in the last 12 months, selected through stratified random

sampling from different unions and sub-districts in Bagerhat. The sample was stratified based on urban and rural areas to ensure a representative sample from both contexts.

- **Qualitative Sample:** A purposive sampling technique was used to select 20 participants for in-depth interviews. These women were selected based on their varying experiences with ANC those who had received full ANC services, those who had limited visits, and those who had not attended ANC at all. Health workers and community leaders were also interviewed to gather additional perspectives on healthcare access and practices.

Data Collection Methods
1. **Quantitative Data Collection:** A structured questionnaire was developed to collect demographic information, ANC utilization (e.g., number of visits, timing, type of care received), socio-economic factors (e.g., income, education), and maternal health outcomes (e.g., complications, birth outcomes). The questionnaire was pre-tested in a neighboring district to ensure clarity and reliability.
   The data collection team consisted of trained enumerators who conducted face-to-face interviews with the selected participants. The interviews were held in participants' homes or local health facilities, with the permission of community leaders.
2. **Qualitative Data Collection:** In-depth semi-structured interviews were conducted with selected women and healthcare providers using open-ended questions. The interviews focused on:
- Reasons for seeking or not seeking ANC.
- Barriers to accessing ANC services.
- Women's experiences with ANC providers.
- Perceptions of maternal health outcomes and the quality of services.

Data Analysis
1. **Quantitative Data Analysis:** The collected data were analyzed using descriptive statistics (frequencies, percentages, mean) to describe the patterns of ANC utilization and maternal health outcomes. Chi-square tests were used to assess the relationships between socio-demographic factors (e.g., education, income) and ANC practices. Data analysis was conducted using SPSS software (Version 25).
2. **Qualitative Data Analysis:** The qualitative data from in-depth interviews were analyzed using thematic analysis. Transcripts were reviewed and coded to identify recurring themes and patterns related to barriers to ANC utilization, quality of care, and maternal health outcomes. The analysis was done manually, and themes were organized into categories to provide insights into women's lived experiences.

Ethical Considerations
The study followed ethical guidelines to ensure the safety and well-being of participants:
- Informed consent was obtained from all participants, and they were assured of confidentiality and the voluntary nature of their participation.

- Participants were informed of their right to withdraw from the study at any time without consequences.
- Interviews were conducted in private settings to maintain privacy and minimize discomfort.
- The study was approved by an institutional review board (IRB) at a local university and adhered to ethical standards in data collection and analysis.

Limitations of the Study
- The study's cross-sectional design limits its ability to establish causal relationships between ANC practices and maternal health outcomes.
- Recall bias may occur in the self-reported data from women regarding their ANC visits and health outcomes.
- Limited geographical coverage of the study, focusing on Bagerhat District, may not fully capture the diversity of experiences in other regions of Bangladesh.

Results
The results of this study are presented in two main sections: Quantitative Findings and Qualitative Findings. The quantitative data were analyzed to assess the patterns of antenatal care utilization, maternal health outcomes, and the association between various factors. The qualitative data provided additional insights into the experiences of pregnant women and healthcare providers in Bagerhat District.

Quantitative Findings
Demographic Characteristics of the Respondents
A total of 300 women participated in the quantitative survey, with the following demographic characteristics:
- **Age Distribution**
  - 15-24 years: 35%
  - 25-34 years: 45%
  - 35-44 years: 20%
- **Educational Level**
  - No formal education: 27%
  - Primary education: 33%
  - Secondary education: 30%
  - Higher education: 10%
- **Socioeconomic Status**
  - Low income (less than BDT 10,000/month): 52%
  - Middle income (BDT 10,000-20,000/month): 38%
  - High income (more than BDT 20,000/month): 10%
- **Residence**
  - Rural areas: 70%
  - Urban areas: 30%

Antenatal Care Utilization
- **Awareness of ANC Services:** The majority of women (88%) were aware of antenatal care services, with significant differences between urban and rural respondents. While 95% of urban women were aware, only 80% of rural women reported knowledge of ANC services.
- **Number of ANC Visits**
  - 1-2 visits: 15%
  - 3-4 visits: 30%
  - More than 4 visits: 55%
  - Women in urban areas were more likely to complete 4

or more ANC visits (62%) compared to rural areas (50%).

- **Timing of First ANC Visit**
  - First trimester: 40%
  - Second trimester: 45%
  - Third trimester: 15%
  - Women in urban areas were more likely to seek ANC in the first trimester (50%) compared to rural areas (35%).
- **Type of ANC Services Received**
  - Blood pressure measurement: 82%
  - Weight measurement: 76%
  - Blood and urine tests: 65%
  - Tetanus vaccination: 72%
  - Counseling on nutrition and birth preparedness: 55%

Maternal Health Outcomes
Pregnancy Complications
- Hypertension: 10%
- Anemia: 18%
- Preterm birth: 5%
- Low birth weight: 7%

Association Between ANC Utilization and Maternal Health Outcomes:
Women who attended 4 or more ANC visits were less likely to experience pregnancy complications such as hypertension (5% vs. 15%) and anemia (12% vs. 25%) compared to those who attended fewer visits. Additionally, women who attended more ANC visits had a higher likelihood of delivering full-term babies (90%) compared to those who attended fewer visits (70%).

Barriers to Accessing ANC Services
- **Distance to Health Facility:** 35% of women from rural areas reported that the distance to the nearest healthcare facility was a significant barrier to accessing ANC services.
- **Financial Constraints:** 30% of participants cited financial difficulties as a major barrier to regular ANC visits, especially for transportation and healthcare costs.
- **Cultural Beliefs and Misconceptions:** 20% of women mentioned that cultural beliefs, such as the preference for traditional birth attendants, influenced their decision to delay or avoid ANC visits.

Qualitative Findings
Barriers to ANC Utilization
From the in-depth interviews, several key barriers were identified:
- **Lack of Information:** Many women in rural areas were not fully informed about the importance of early and regular ANC visits. Some were unaware of the risks associated with delayed or inadequate ANC care.
- **Cultural Factors:** In some communities, there was a cultural preference for traditional birth attendants over trained healthcare providers. Participants noted that traditional healers were more accessible and were often considered more "trustworthy" by older generations.
- **Financial and Logistical Barriers:** Several women mentioned that transportation costs and the expense of healthcare services were significant barriers. One respondent noted, "I couldn't afford to go to the health center more than once, as the travel expenses are high, and I must take time off from work."
- **Health Provider-Related Issues:** Some women reported dissatisfaction with the quality of care at healthcare facilities, including long waiting times, lack of attention from healthcare providers, and insufficient communication about the services being offered.

Perceived Benefits of ANC
Despite the challenges, many women acknowledged the benefits of ANC:
- **Improved Health Knowledge:** Women who attended ANC regularly reported that they gained valuable information on nutrition, breastfeeding, and birth preparedness. One respondent shared, "The nurses told me what foods to eat and how to take care of my health, which helped me during my pregnancy."
- **Early Detection of Complications:** Women who received timely ANC visits were more likely to detect pregnancy complications early, such as anemia and high blood pressure, which they believed contributed to safer pregnancies and deliveries.

Discussion
The findings of this study highlight several important insights into the practices surrounding antenatal care (ANC) and the maternal health outcomes in Bagerhat District, Bangladesh. This section discusses the implications of the study's results in light of the existing literature and identifies potential strategies for improving ANC utilization and maternal health in the region.

1. ANC Utilization and Socio-Demographic Factors
The study found that while awareness of ANC services was high (88%), actual utilization of these services varied significantly between rural and urban areas. Urban women were more likely to initiate ANC visits in the first trimester and to complete the recommended number of visits (four or more). This is consistent with previous studies that have shown that urban areas often have better access to healthcare services due to better infrastructure, more healthcare providers, and closer proximity to health centers (Agha, 2000; Sarker et al., 2016) [1, 19].
The lower utilization of ANC services in rural areas can be attributed to several barriers identified in the study, such as distance to healthcare facilities, financial constraints, and cultural factors. These findings align with other studies conducted in rural Bangladesh, where access to healthcare facilities is limited, and the cost of services often deters women from seeking care (Hossain & Khan, 2014; Karim et al., 2017) [11, 13]. Furthermore, socio-economic factors such as low income and educational level were significant predictors of ANC utilization, confirming that education and income play a crucial role in women's healthcare decisions.

2. Barriers to Accessing ANC
The distance to healthcare facilities emerged as one of the primary barriers, especially in rural areas. This is a well-documented challenge in many parts of Bangladesh, where rural health infrastructure is underdeveloped and transportation options are limited (Hossain et al., 2016) [12]. In some cases, women reported walking for hours to reach

the nearest health facility, which not only increased the financial burden but also resulted in delayed care. The study found that women who attended fewer ANC visits were more likely to face these transportation challenges, which impacted their overall health outcomes.

Financial constraints also played a significant role in limiting ANC utilization. Many women, particularly from low-income families, cited the cost of transportation, medications, and tests as key barriers to seeking care. This finding is consistent with research showing that the costs of healthcare remain a significant barrier to the use of maternal healthcare services, particularly for the poorest populations (Rahman *et al*., 2015) [16]. Government programs or insurance schemes targeting low-income households could help mitigate these financial challenges and improve access to ANC services.

Another important finding was the influence of cultural beliefs and traditional practices. Despite the availability of modern healthcare services, some women preferred to rely on traditional birth attendants (TBAs), especially in rural areas. This preference for TBAs over skilled healthcare providers reflects deeply rooted cultural beliefs and a lack of trust in the formal healthcare system (Rahman & Rahman, 2012) [18]. In some communities, there is a belief that traditional methods are safer or more familiar, leading women to delay or avoid seeking ANC. Efforts to integrate traditional birth attendants into the formal healthcare system through training and collaboration with health professionals might improve healthcare utilization and birth outcomes.

3. Impact of ANC on Maternal Health Outcomes
One of the most significant findings of this study was the positive impact of regular ANC visits on maternal health outcomes. Women who attended four or more ANC visits had a significantly lower incidence of hypertension, anemia, and low birth weight, and were more likely to deliver full-term babies. This finding is consistent with the growing body of evidence that highlights the benefits of early and consistent antenatal care in preventing complications and improving pregnancy outcomes (Mitra *et al*., 2015) [15].

The study also highlighted that early detection of complications such as anemia and hypertension, through regular ANC visits, helped women manage their conditions more effectively. Timely treatment of conditions like anemia and high blood pressure can significantly reduce the risks of preterm birth and low birth weight, which are common contributors to maternal and neonatal morbidity and mortality (Das *et al*., 2017) [9]. This reinforces the importance of promoting early initiation of ANC, ideally in the first trimester, to maximize the benefits of maternal healthcare.

4. Health Provider and System-Related Issues
In terms of healthcare quality, some women reported dissatisfaction with the services provided at healthcare facilities, particularly in rural areas. Issues such as long waiting times, perceived lack of attention from healthcare providers, and inadequate communication about the services being provided were identified as barriers to effective ANC. These findings echo concerns in other studies in Bangladesh about the quality of care and its impact on healthcare utilization (Nahar *et al*., 2015) [16]. Improving the efficiency

and quality of services at health facilities, through better staff training, increased resources, and improved patient-provider communication, is crucial to ensuring that women seek and benefit from ANC services.

5. Recommendations for Policy and Practice
Based on the findings, the following recommendations are made to improve ANC utilization and maternal health outcomes in Bagerhat District:
1. **Increase Access to Healthcare:** The government should invest in improving healthcare infrastructure in rural areas, including the construction of more community health centers and the provision of mobile health services to address transportation barriers.
2. **Financial Support for Low-Income Women:** Implementing subsidies or insurance schemes for low-income families could alleviate the financial burden associated with ANC visits, medications, and transportation.
3. **Community Awareness and Education:** Community-based education programs, particularly in rural areas, can raise awareness about the importance of early ANC visits and skilled birth attendance. Training traditional birth attendants to refer women to skilled healthcare providers could bridge the gap between traditional and modern healthcare practices.
4. **Improve Quality of Care:** Strengthening the quality of care at health facilities through better staff training, adequate medical supplies, and effective patient communication will increase trust in the healthcare system and encourage women to attend regular ANC visits.
5. **Enhance Provider-Patient Communication:** Healthcare providers should be trained to communicate effectively with patients, explaining the benefits of regular ANC visits and addressing any cultural concerns women may have regarding modern medical care.

Conclusion
This study provides valuable insights into the antenatal care (ANC) practices and maternal health outcomes in Bagerhat District, Bangladesh. The findings demonstrate that while awareness of ANC services is high, utilization remains suboptimal, especially in rural areas. Geographical barriers, financial constraints, and cultural factors play significant roles in limiting access to and utilization of ANC services. However, the study also highlights the benefits of regular ANC visits, including early detection of complications, better management of health conditions such as anemia and hypertension, and improved maternal and neonatal outcomes.

Women who attended the recommended number of ANC visits experienced fewer pregnancy complications, such as hypertension and anemia, and were more likely to have full-term, healthy babies. The study also emphasized the importance of early initiation of ANC visits, ideally in the first trimester, to maximize the benefits of maternal healthcare.

To improve maternal health in Bagerhat District, the study recommends several interventions:
1. Improving access to healthcare by investing in rural

healthcare infrastructure and mobile health services.
2. Reducing financial barriers by implementing subsidies or insurance schemes for low-income families.
3. Promoting community awareness through education programs focused on the importance of early ANC visits.
4. Enhancing the quality of care at healthcare facilities, including better staff training and improved patient-provider communication.
5. Bridging the gap between traditional and modern healthcare by integrating traditional birth attendants into the formal healthcare system.

By addressing these barriers and improving ANC services, significant progress can be made in reducing maternal and neonatal morbidity and mortality in Bagerhat District. This would contribute to achieving the broader goals of improving maternal health and gender equality in Bangladesh, in line with the United Nations' Sustainable Development Goals (SDGs).

Recommendations
1. **Enhance Healthcare Access:** Improve healthcare infrastructure in rural areas and introduce mobile health services to reduce geographical barriers.
2. **Financial Support:** Implement subsidies or insurance schemes to alleviate financial constraints and make ANC services more affordable for low-income families.
3. **Community Awareness:** Launch education programs to raise awareness about the importance of early ANC visits and the benefits of skilled birth attendance.
4. **Improve Quality of Care:** Focus on improving the quality of care at health facilities through better staff training, adequate medical supplies, and effective communication with patients.
5. **Integrate Traditional Birth Attendants:** Train traditional birth attendants to refer women to skilled healthcare providers, bridging the gap between traditional and modern practices.

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