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Assessing antenatal care quality and resulting outcomes for women at a tertiary-level hospital

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Abstract
Background: Antenatal care (ANC) quality is pivotal for ensuring positive maternal and neonatal health outcomes. Antenatal care (ANC) involves regular medical check-ups, screenings, and educational sessions during pregnancy to monitor the health of both mother and fetus. High-quality antenatal care (ANC) can significantly reduce risks such as preterm labor, low birth weight, and maternal complications. This study aimed to assess the quality of antenatal care services and their impact on health outcomes for women.
Methods: This observational cross-sectional study was conducted over six months at Shaheed Suhrawardy Medical College Hospital in Dhaka, Bangladesh. A total of 100 women admitted to the Obstetrics and Gynaecology Ward for delivery during the study period were purposively selected as participants. Clinical examinations and relevant investigations were conducted meticulously. The data were analyzed using MS Office tools.
Results: Educated women are more likely to have regular ANC and at least four visits. Women over 25 are less likely to attend ANC, while those under 20 and 91.1% of women aged 20-25 regularly attend. Primiparous women showed a higher rate of ANC attendance (95.7%), but women with higher parity (Parity 4+) also increase ANC usage (71.4%). In maternal outcomes, premature rupture of membranes, preeclampsia, and malpresentation occurred in 15%, 12%, and 10% of mothers, respectively. Caesarean sections were more common in rural areas (56.4%) than urban (71.0%). For neonatal outcomes, 15% of babies were low birth weight and prematurity was noted in 15% of cases.
Conclusion: Cultural, educational, and socioeconomic factors significantly influence maternal healthcare-seeking behavior and ANC quality in Bangladesh. Disparities in access exist across urban-rural divides, education, treatment sites, economic classes, and gravidity. Antenatal care is underemphasized due to focus on urgent obstetric complications management.

Keywords: ANC, antenatal care, maternal complications, obstetrics, outcomes, women

Introduction

The quality of antenatal care plays a crucial role in the effective utilization and adherence to interventions. Over the past two decades, there have been significant advancements in reducing maternal and childhood mortality and increasing antenatal service awareness in developing countries. Antenatal care (ANC) provides medical supervision from conception to delivery, involving physicians, midwives, or obstetricians [1]. It includes routine monitoring and examinations during pregnancy, extending into the early neonatal and postpartum periods. In modern obstetrics, special care for pregnant women through public health services emerged relatively late. During the latter half of the 20th century, growing international awareness of maternal mortality prompted collaborations between national governments and donor agencies to improve maternity care access in developing countries. However, ensuring delivery care access is more complex than providing antenatal services due to logistical and operational challenges. Consequently, many programs have prioritized antenatal care over delivery care [2]. But problems of maternal morbidity and mortality have been associated with inappropriate health care seeking behavior in pregnancy and childbirth [3]. Antenatal and postnatal care services are significant interventions to improve maternal health and prevent maternal and infant deaths. However, these services are poorly developed in Bangladesh, particularly among Indigenous women [4]. The World Health Organization (WHO) advises a minimum of four antenatal care visits, starting by the fourth month of pregnancy. However, a study in Bangladesh reveals low adherence, with only 12% of recent pregnancies meeting this recommendation. The median time for the first visit was 5.4 months, and merely one in seven women began antenatal care in the first trimester.

While 84% of women reported receiving dietary advice, only 54% were informed about where to go for maternal complications, and just 45% received comprehensive guidance [5]. In Bangladesh, the reduction in levels of maternal mortality and improvement of maternal health have been central policy and program goals since the fourth Population and Health Program, which began in 1992 [6]. In Bangladesh, many women face life-threatening complications during pregnancy and childbirth, often due to a lack of awareness about available healthcare services. This lack of awareness contributes to low healthcare service utilization, resulting in maternal morbidity, mortality, and other complications. Quality antenatal care (ANC) involves medical supervision from conception to delivery by a physician, midwife, or obstetrician, or a combination of these professionals [7]. In addition to utilization of health care services, the place of child delivery is an important factor in pregnant women's care seeking behavior [6]. Prevalence of all outcome variables and maternal complications was higher among women not attending any ANC visit than those attending at least one ANC check-up [8]. Most of the deliveries take place at either woman's husband's house or at the parents' house. These deliveries are often assisted by untrained birth attendants or by elderly relatives [6]. Three types of delays contribute to the likelihood of maternal death: 1) delay in deciding to seek care, 2) delay in reaching a treatment facility, and 3) delay in receiving adequate treatment at the facility [9]. Quality healthcare during pregnancy encompasses promotive, preventive, and curative aspects. Antenatal care (ANC) is the most well-documented form of healthcare seeking during pregnancy, providing multiple types of care in a formal clinic setting while educating mothers on self-care at home. However, there is considerable debate about the critical ANC contact points, referring to the specific times during pregnancy when care is most crucial [10]. Routine prenatal care includes various lab tests to identify conditions that may increase the risk of complications. Early in pregnancy, tests typically include a complete blood count, blood type, urinalysis, and screenings for rubella, hepatitis B and C, sexually transmitted infections, human immunodeficiency virus, and tuberculosis [11]. Syphilis screening is advised for all pregnancies, with repeat tests at 28-32 weeks and at delivery for women at high risk. Every pregnancy should also include blood group and Rh type screening, along with an antibody screen in the first trimester and again at 28 weeks for Rh-negative women. These screenings help prevent hemolytic disease of the newborn [12]. We now have better evidence regarding effective and ineffective strategies for reducing maternal mortality and the role of antenatal care [13]. Elements like routine height and weight monitoring have not proven effective in reducing serious complications or maternal deaths [14]. However, interventions like detecting and treating anemia and managing sexually transmitted infections improve health, although they do not necessarily reduce maternal death risk.

Methodology

This was an observational cross-sectional study, conducted in Shaheed Suhrawardy Medical College Hospital over six-month duration, from April 2018 to October 2018. Total sample size was 100. Sample was selected by purposive sampling technique. Women admitted in Obstetrics and Gynaecology Ward for birth delivery during study period were included. As per the inclusion criteria, women who were admitted to the Obstetrics and Gynaecology Ward for childbirth during the study period and had provided informed consent were included. On the other hand, according to the exclusion criteria, women who had a history of co-morbid diseases, such as heart disease or diabetes mellitus, were excluded. Additionally, those who faced medical or obstetric complications requiring prompt delivery were also excluded from the study. Informed consent was obtained for the study, which involved collecting detailed histories on age, sociodemographic features, parity, pregnancy trimester, ANC check-up frequency and regularity, BP checks, TT vaccination, medication compliance, planned delivery place, and food intake. Comprehensive clinical examinations, including general, systemic, and gynecologic assessments, were conducted. Participants underwent routine investigations like hemoglobin, ESR, LFT, random blood sugar, complete urine examination, followed by an ultrasound of the abdomen and pelvis. Data were analyzed by using MS Office tools.

Results

In this study, patients were aged 17 to over 35 years, with 42.0% in the 20-25 age group and 24.0% in the 26-30 group. The mean age was 23.5 ± 9.54 years. Most respondents were from urban areas (62.0%), with 49.0% at the primary education level. The poor class constituted 52% of participants, followed by 28% upper class and 20% middle class. In this study, 58.0% of respondents were housewives and 20.0% were daily workers. Primigravida women comprised 46.0%, with 40.0% having parity 2 to 3, and 14.0% being multiparous. Regarding childbirth location, 48.3% gave birth at their parents' house, 37.0% at their in-law's house, and only 14.5% at a hospital. Among rural mothers, 34.2% had regular antenatal check-ups, compared to 87.0% of urban mothers. The study found that women over 25 years were less likely to visit service centers during pregnancy compared to those under 25. All women under 20 and 91.1% of those aged 20-25 attended regular ANC, with participation decreasing as age increased. Educated women were more likely to have regular antenatal care and four or more visits: 88.2% of higher educated, 71.4% of primary, 66.7% of secondary, and only 23.0% of illiterate women. In rural areas, the rate of ANC attendance was low, with only 13 women participating. Primiparous women significantly influenced antenatal care attendance, with 95.7% receiving care. However, this trend decreased among women with 2-3 parity, where only 30.7% attended ANC, while those with parity 4+ saw an increase to 71.4%. Regarding maternal complications, PROM and hypertensive disorders or preeclampsia accounted for the highest cases at 15.0% and 12.0%, followed by malpresentation (10.0%), failed induction (9.0%), obstructed labor (8.0%), and prolonged labor (8.0%). Participants with regular ANC experienced complications in 12% of cases, while those with irregular ANC faced complications in 88% of cases. Caesarean section rates were higher among rural women, at 71.0%, compared to 56.4% in urban areas. There were no perinatal deaths among 100 deliveries. Of 100 live births, 29.0% required resuscitation, 15.0% were low birth weight, 76.0% were of normal weight, and 9.0% were overweight. Additionally, 28.0% of babies had an APGAR score below 7 at birth, with prematurity in 15.0% of cases. Septicemia occurred in 15.0%, birth asphyxia in 18.0%, and jaundice in 10.0% of babies.

Table 1: Age distribution of participants (N=100)

Age (Year)	n	%	Mean ± SD
<20	16	16	23.5 ± 9.54
20-25	45	45	
26-30	26	26	
>30	13	13	

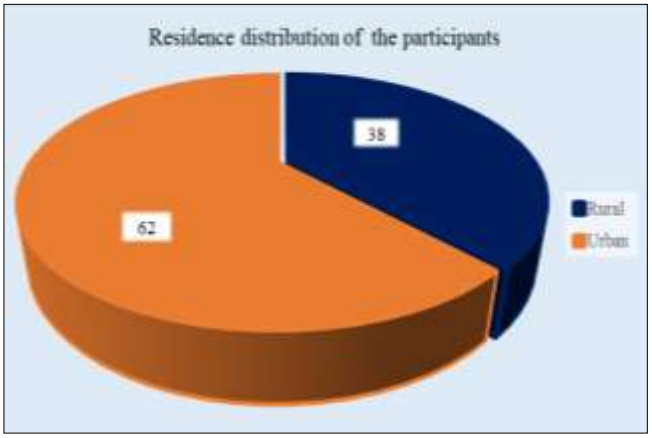

Fig I: Pie chart showed residence wise participants (N=100)

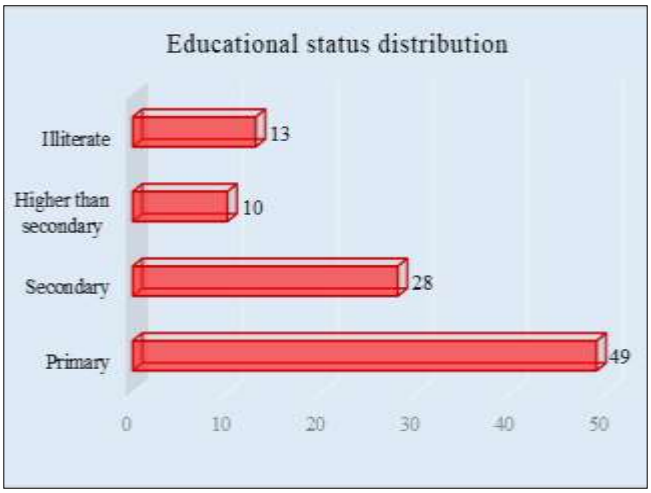

Fig 2: Bar chart showed educational status of participants (N=100)

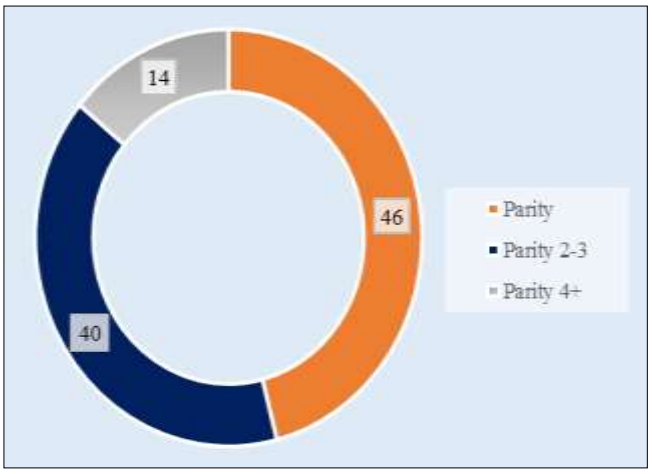

Fig 3: Ring chart showed obstetrics history (parity) of mothers (N=100)

Table 2: Place of first childbirth (N=100)

Place	n	%
Parents' house	48	48.3
Law's house	37	37
Hospital	14	14.5

Table 3: Frequency of ANC (N=100)

ANC	Rural (n=38)	Urban (n=62)
Regular	13(34.2%)	54(87.0%)
Irregular	25(65.7%)	8(12.9%)

Table 4: ANC visits by age groups (N=100)

Age (Year)	Frequency		Total
	Regular (n=67)	Irregular (n=33)	
<20	16	0	16
20-25	41	4	45
26-30	10	16	26
>30	0	13	13

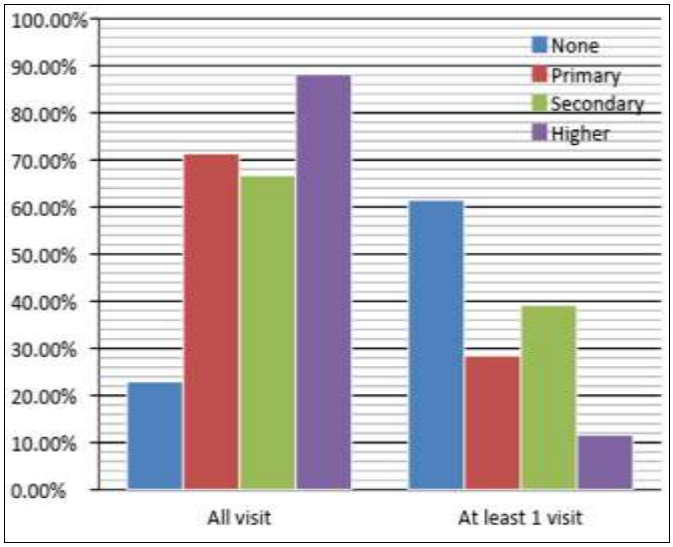

Fig 4: Column chart showed antenatal care and education (N=100)

Table 5: Trends of ANC visits (N=100)

Visits	Rural (n=38)	Urban (n=62)
Regular (All visit)	13	54
First visit	16	3
Second visit	7	5
Third visit	2	0
Forth visit	38	62

Table 6: Antenatal care by parity (N=100)

Parity	Regular (n=67)	Irregular (n=33)	Total
Primiparity	45	2	47
Parity 2-3	12	27	39
Parity 4+	10	4	14

Table 7: Distribution of the patients according to maternal complications and outcome (N=100)

Complication	%
PROM	15
Preeclampsia	12
Malpresentation	10
Obstructed labor	8
Severe oligohydramnios	6
Gestational diabetes	7
Prolong labour	8
Failed induction	9
No complications	38

Table 8: Complication by ANC (N=100)

Complication	n	%
Regular ANC	7	12%
Irregular ANC	55	88%

Table 9: Neonatal outcomes (N=100)

Neonatal outcome	%
Alive	100
Needed resuscitation	29
Not needed	71
Birth weight	
LBW (<2.5 kg)	15
Average (2.5-4 kg)	76
Over weight (> 4 kg)	9
APGAR score (at birth)	
<7	28
≥7	72
Fetal complication	
Prematurity	15
Birth asphyxia	18
Septicemia	15
Jaundice	10

Discussion

In the study, the majority of patients were aged 20-25 years (42.0%) and had completed a primary level of education (42.0%). A significant proportion were housewives (58.0%), followed by daily workers (20.0%). Key determinants of low ANC utilization among women included place of residence, age, educational level, distance to health services, and access to mass media. Another study highlighted that the highest number of cases (30.2%) involved individuals aged 25-29 years, followed by 27.5% in the 20-24 age group and 19.8% in the 30-34 age group. A study in rural Bangladesh confirmed that higher education was associated with increased use of ANC [15]. This study found that all women under 20 years and 91.1% of those aged 20-25 were receiving regular ANC, with this trend decreasing as age increased. A study by Islam MR *et al*. [4] indicated that women aged 25-35 were less likely to visit service centers during pregnancy compared to those under 25. Nationally in Bangladesh, ANC visit rates stand at 60.3% [15], but this study reported a higher rate of 67.0%. In sub-Saharan Africa, 68% of women have at least one antenatal visit, while levels in other world regions range from 82% to 86% [4]. In the study, 42.0% of respondents were married at ≤18 years, with a higher prevalence in rural areas (71.0% vs. 24.1% urban). Among the women, 39.0% married between 19 and 25 years of age, while 19.0% married between 25 and 30 years, none of whom were from rural areas. Aktar S *et al*. [16] found that 8.5% of women married between 20 and 24 years, 3.4% between 25 and 29 years, and 2.5% between 30 and 34 years. Parity impacts antenatal care use, with higher-parity women generally using less ANC in all regions [17]. A study in the Chittagong Hill Tracts revealed that Indigenous groups had less access to healthcare facilities, contraception, and ANC visits compared to Bengali people [15]. The present study indicates that 88.2% of higher-educated mothers received regular ANC, compared to 71.4% with primary education, 66.7% with secondary education, and only 23.0% among the illiterate. A previous study [16] found that 34.7% of respondents were educated between grades I to V, 33.9% between grades VI to X, 11.9% passed the SSC examination, and only 2.5% were college graduates. Our study found that 88.1% of rural women did not have regular medical check-ups during pregnancy, with only 11.9% attending such check-ups, indicating that regular medical care during pregnancy is not common for women in rural areas [6]. Additionally, the place of childbirth reveals care-seeking behaviors: 48.3% of respondents gave birth to their first child at their parents' house, 37.0% at their in-law's house, and only 14.5% in a hospital. In comparison, another study [16] reported that 74.6% birthed their first child at their parents' house, 18.6% at their in-law's house, just 0.8% at a government hospital, and nearly 6% at private clinics. In a study [17], it was suggested that there are ways to mitigate the disadvantages of low educational levels. Lack of education does not have to be a strong determinant in the use of antenatal care if appropriate program interventions encourage women to utilize available services. In our study, the primiparous group had a significant influence on antenatal care with 95.7% receiving care. However, this trend decreased for women with 2-3 parity, where only 30.7% attended ANC, but increased for those with higher parity (4+), where 71.4% received care. Another study [17] reported that older women had slightly lower levels of antenatal care compared to those under 35. In our evaluation of maternal outcomes and complications, the study found that PROM and hypertensive disorders or preeclampsia were prevalent, affecting 15.0% and 12.0% of mothers, respectively. The rate of Caesarean sections was notably higher among rural subjects, with 56.4% in urban areas and 71.0% in rural areas. Regarding neonatal outcomes, 15.0% of babies were born with low birth weights, and prematurity was observed in 15.0% of cases. A similar study [18] conducted in Bangladesh reported that among 1,253 respondents, 70.3% underwent Caesarean sections, while 29.7% had normal vaginal deliveries.

Limitation of the study

The study had several limitations, including a small sample size and confinement to a single center—the Shaheed Suhrawardy Medical College Hospital—limiting its national applicability. The setting in a tertiary care hospital might not reflect situations in primary or secondary centers. A large-scale study is needed for more conclusive results. Additionally, the lack of a uniform management protocol across hospital units and the use of purposive sampling may have introduced personal bias.

Conclusion and Recommendation

In Bangladesh, maternal healthcare-seeking behavior and the quality of antenatal care are heavily influenced by cultural, educational, and socioeconomic factors. Significant disparities exist in access to care based on urban-rural location, levels of education, treatment facilities, economic classes, and the number of previous pregnancies. Antenatal care frequently takes a backseat to the management of urgent obstetric complications. This underemphasis on antenatal care highlights the need for comprehensive strategies addressing these disparities to improve maternal health outcomes and ensure equitable access for all women.

Conflict of Interest

Not available

Financial Support

Not available

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