

RESEARCH ARTICLE

Identifying the Factors Influencing Antenatal Care Visits in Bangladesh: A Component Towards Achieving the Third Sustainable Development Goal, "Good Health and Wellbeing"**Samira Salam***Department of Mathematics, American International University-Bangladesh, Dhaka, Bangladesh.***ABSTRACT**

Background: Antenatal care (ANC) is the most effective intervention for protecting the health of both the fetus and the pregnant woman by quickly detecting problems in the early stages. The World Health Organization (WHO) recommends for a cost-effective, evidence-based approach whereby pregnant women with uncomplicated pregnancies should get at least four antenatal care (ANC) visits. A significant proportion of women in many developing countries do not obtain the essential minimum of four visits. Determining the levels and determinants of ANC coverage is crucial for the government and other stakeholders to implement effective measures to enhance maternal health and pregnancy outcomes.

Purpose: The objective of this study is to identify the factors associated with receiving a minimum of four antenatal care visits.

Method: This study is based on data from the Bangladesh Demographic and Health Survey (BDHS) 2017–2018. To identify the factors associated with the use of ANC during pregnancy, various statistical tools such as χ^2 test and multinomial logistic regression analysis were performed.

Result: The socioeconomic and demographic variables that are strongly linked to the quantity of ANC visits and the obtaining of vital ANC service components in Bangladesh were identified by this study. The chance that pregnant women in Bangladesh will seek four or more ANC visits is significantly influenced by the administrative division, place of residence, mothers' educational attainment, financial status, and partner's educational attainment.

Conclusion: The results of this study show that Bangladesh does not comply with the WHO's recommendation on the minimum number of ANC visits. This investigation revealed the socio-economic and demographic factors that are significantly associated with the number of ANC visits and the receipt of essential components of ANC services in Bangladesh. The results of this study might help policymakers and health care programmers adopt regulations and programs to maximize ANC coverage for all people.

Suggestion: To further improve the availability of competent maternal care, public media campaigns highlighting the advantages of attending ANC regularly and adhering to its suggested content should be strengthened. The ANC program in Bangladesh has to be revised in accordance with the most recent WHO guidelines, which emphasize at least eight ANC visits in order to significantly improve mother and child health.

Keywords: *Antenatal Care (ANC) visit, Determinants of ANC visit, BDHS Data, χ^2 test, Multinomial Logistic Regression Analysis*

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Introduction

The Maternal Mortality Estimation Inter-Agency Group of the United Nations (UN) estimated that 800 women globally died per day in 2020 from pregnancy-related or childbirth-related problems; 95% of these fatalities occurred in poor nations (WHO, 2023). About 73% of such a type of death were directly related to pregnancy (Say et al. 2014). In most developing countries, maternal mortality is an important threat to public health (Say et al. 2014; Zere, et al. 2013; Islam et al. 2022). Based on the 2022 data from Bangladesh Sample Vital Statistics, the estimated maternal mortality ratio (MMR) in Bangladesh was 156 per 100,000 live births, while the neonatal mortality rate (NMR) was 20 deaths per 1,000 live births in the same year (MPDSR, 2022). Sustainable Development Goal (SDG) 3 sets out ambitious targets, mandating Bangladesh to decrease the MMR to below 70 per 100,000 live births and neonatal mortality to below 12 per 1,000 live births by 2030 (UNO, 2015).

Antenatal care (ANC) is the finest treatment available to protect the health of the unborn child and the pregnant mother by quickly identifying problems throughout the early stages of pregnancy. This care is the routine monitoring of seemingly healthy expectant mothers who do not exhibit any symptoms (screening), with the aim of identifying illnesses or exacerbating obstetric issues and dispensing lifestyle and pregnancy education. The goals of ANC are to protect and monitor the health of the mother and fetus, recognize and handle any pregnancy-related issues, ease the woman's complaints, get her ready for delivery, and encourage good parenting practices (WHO, 2016). Additional objectives of ANC services include achieving Denny, 2022). Moreover, it offers an opportunity to identify, understand, and treat anomalies in pregnancy using a variety of health-promoting and preventive care measures (Islam et al., 2022; Gross et al. 2012). The WHO recommends a core set of services that include blood pressure measurement, tetanus toxoid vaccination, urine testing, iron supplementation, body weight measurement, and counselling regarding danger signs, despite the possibility of variations in national strategies regarding the content of ANC. According to some studies, ANC by itself can reduce maternal mortality by 20% when provided with high quality and regular attendance (Testa J et al., 2002). Through ANC services, a medical professional can inform women about the symptoms and warning signs of various conditions and can act promptly to address any problems (WHO, 2023).

Models developed in Europe around a century ago served as the basis for the current international standard for routine ANC visits (Oakley A, 1982). According to the European model, women visited hospitals or other medical facilities once a month for the first six months of pregnancy, once every two to three weeks for the next two months, and once a week from there until delivery. Thus, over the course of her pregnancy, a woman would schedule about 12 appointments with a doctor. Without any evidence of their cost-effectiveness, the time and procedure for routine ANC visits were unilaterally added to the traditional European approach. As new evidence and technology have emerged, numerous attempts have been made to rationalize the nature, frequency, and application of ANC techniques. Systematic studies have also evaluated the effectiveness of specific prenatal care program components (Villar J et al., 2001; Yaya et al. 2017; Muchie et al. 2017; Moller, et al. 2017). The World Health Organization (WHO) recommends a cost-effective, evidence-based model that pregnant women with uncomplicated pregnancies receive a minimum of four ANC visits, with the first visit taking

place before 14 weeks of gestation. This suggestion is supported by a significant cluster randomized WHO antenatal care trial (WHO ACT) carried out in 2001 and a thorough analysis of the efficacy of various maternal health care model types (Villar et al., 2001).

The WHO ACT found that reducing ANC visits to at least four did not increase the risk of adverse outcomes for mothers and newborns any more than did traditional Western ANC packages. Additionally, there was a chance to save money (Villar J et al., 2001). The use of ANC has increased in low- and middle-income countries (LMICs) since the WHO ANC model, also known as focused ANC (FANC) or basic ANC, which was introduced in 2002 (WHO, 2016). FANC and basic ANC were goal-oriented approaches to delivering evidence-based interventions carried out at four critical times during pregnancy. In light of the 2010 Cochrane review, a multidisciplinary team of researchers reviewed the WHO ACT data and found that fewer prenatal visits were in fact harmful to health (Dowswell T et al., 2010). The risk of foetal death between 32 and 36 weeks was found to be 80% higher for high-risk women and 50% higher for low-risk women in those who attended fewer prenatal appointments (Vogel JP et al., 2013). Based on these findings, the World Health Organization published a new set of recommendations in 2016 to improve the quality of prenatal care, reduce the frequency of stillbirths and pregnancy issues, and give women the best possible pregnancy experience. The quality and content of ANC must also be monitored if the visits are meant to function as an effective preventive measure.

However, a large percentage of women in most developing nations do not receive the required minimum of four visits (WHO, 2015), and compliance with the minimum level of recommended content for ANC appears to have fallen short due to poor accessibility, an inability to pay for care, cultural barriers, and a lack of knowledge (Chowdhury A et al., 2003; Pallikadavath S et al., 2007). The efficiency of ANC services has been demonstrated by prior research to be significantly influenced by both the elements covered by ANC visits and the number of ANC visits (Nwaru BI et al., 2012; Kvei N et al., 2012). Analyzing the levels, trends, and determinants of ANC coverage and its content is essential if the government and other stakeholders are to take the right steps to improve maternal health and pregnancy outcomes. This is due to the fact that the general scope and subject matter of ANC visits determine a woman's overall reproductive health.

The Ministry of Health and Family Welfare (MH & FW) of Bangladesh complies with the WHO's recommendations for ANC visits and the necessary elements of ANC visits. Between the two BDHSs, the proportion of rural mothers receiving high-quality ANC increased by nearly 15 percent (17% in 2014 and 32% in 2017–18). While a significant proportion of illiterate mothers (64% in 2014 and 57% in 2017–18) received low-quality ANC. Understanding the factors influencing ANC quality in low- and middle-income countries has not been the focus of significant number of studies (Singh et al., 2019; Akter et al., 2023). Bangladesh has led to an inadequate number of studies on ANC quality, the most of which were carried out in rural areas (Jo et al., 2019; Rahman, et al., 2017; Islam and Masud, 2018; Begum et al. 2018; Pervin et al. 2021; Kabir, et al. 2020; Talukder, et al. 2021; Akter et al. 2023). However, these studies are crucial for directing targeted actions that aim at improving both the quantity and quality of ANC coverage. Thus, the purpose of this study is to increase the body of knowledge in this field by looking at the factors associated to the adoption of high-quality ANC and identifying the factors of high-quality ANC visits using data from the BDHS 2017–18 survey. These findings may assist health care programmers and policymakers in developing effective policies and programs to optimize ANC coverage for all individuals.

Objectives of the Study

This research aims to assess the factors affecting the utilization of antenatal care (ANC) among mothers in Bangladesh.

The specific objectives of the study are:

- i. To determine the factors that influence pregnant women in Bangladesh who seek antenatal care (ANC) visits.
- ii. To pave the way for achieving the Sustainable Development Goals (SDGs), particularly the third goal (good health and wellbeing).

OBJECTIVES OF THE STUDY

The general objective of this study is to comprehensively analyze the challenges confronting tertiary education in Ghana and their impact on education financing.

Specific objectives are to:

1. Identify and categorize the major challenges facing tertiary education institutions in Ghana
2. Examine how these challenges impact education financing mechanisms and institutional sustainability
3. Assess the effectiveness of current funding approaches and resource mobilization strategies
4. Analyze quality assurance constraints and their relationship to resource limitations

Methodology of the study

Data source

This study is based on data from the Bangladesh Demographic and Health Survey (BDHS) 2017–2018, which is the eighth national survey to collect data on women's and children's demographics and health status. A sample of approximately 20,250 randomly selected households that are nationally representative make up the BDHS (2017–2018). All ever-married women between the ages of 15 and 49 who regularly reside in the selected homes or who spent the night before the survey in the selected homes were eligible for interviews. For both urban and rural areas as well as each of Bangladesh's eight regions—Barishal, Chattogram, Dhaka, Khulna, Mymensingh, Rajshahi, Rangpur, and Sylhet—the survey was designed to provide precise estimates for vital national indicators.

Study variables

Antenatal care visit (ANC), measured as a binary outcome, serves as the study's outcome variable. The variables used as predictors in this study include the respondent's regional location, respondent's educational level, their wealth index status, and the type of residency they have, education level of the respondent's partner, employment status of the respondent, total number of children, members covered by health insurance, size of the household and the sex of the household head.

Analytic strategy

The summary measurements were conducted utilizing SPSS software to estimate parameters. A Chi-square test was used to examine the connection between various characteristics and attendance at a minimum of four ANC visits. A multinomial logistic regression analysis was conducted to identify factors associated with women's use of a minimum of four antenatal care visits throughout pregnancy.

Results

Background Characteristics of Mothers

Table 1 shows how mothers are distributed based on their background characteristics. Out of the 4,946 mothers in the sample, the majority are middle-aged, falling into the age groups of 25–29 (26.2%) and 20–24 (35.4%). The distribution of respondents across all geographical areas, which ranges from 10.4% in Khulna to 16.7% in Chittagong, appears to be nearly homogeneous. According to their place of residence, the majority of respondents (about 65.6%) were from rural areas. In terms of women's educational

attainment, 48% of them had completed secondary school, roughly 27.7% had finished primary school, and roughly 18.2% had completed higher education. Of the mothers, about 48% had finished secondary school, about 18% had finished higher education, and about 27.7% had finished their primary education. Based on the wealth index, 21.6% of the mothers came from the poorest family, and 20.4% from the richest family. Only 0.2% of the mothers had health insurance. In terms of husbands' educational attainment, roughly 33% had finished secondary school, and 19.5% had finished higher education. Approximately 37% of the mothers had a job. In terms of household headship, approximately 88% of the families were headed by men.

Table 1. Background characteristics of the mothers.

Characteristics	Percentage	Characteristics	Percentage
Age		Place of Residence	
15-19	17.1	Urban	34.4
20-24	35.5	Rural	65.6
25-29	26.2	Health Insurance	
30-34	15.1	No	99.8
35-39	5.1	Yes	0.2
40-44	1.0	Mother's Education	
45-49	0.2	Illiterate	6.1
Division		Primary	27.7
Barisal	10.6	Secondary	48.0
Chittagong	16.7	Higher	18.2
Dhaka	14.8	Husband's Education	
Khulna	10.4	Illiterate	14.0
Mymensingh	12.0	Primary	33.5
Rajshahi	10.5	Secondary	33.1
Rangpur	11.2	Higher	19.5
Sylhet	13.8	Employment Status	
Wealth Index		No	62.6
Poorest	21.6	Yes	37.4
Poorer	20.2	Sex of the Head	
Middle	18.0	Male	88.1
Richer	19.8	Female	11.9
Richest	20.4		

Association Between at least four ANC Visits and Different Characteristics of Mothers

The findings of the association between a minimum of four antenatal care visits by pregnant women and various variables are presented in Table 2. The results indicate that the relationship between the age of pregnant women and the minimum number of ANC visits is ambiguous. The proportion of women who had a minimum of four ANC visits rises with age until 25-29, after which it declines as age increases up to 35-39. The prevalence of at least four ANC visits is highest among those aged 40-44, at 50.0%. A number of couples over the age of 35 attempting to conceive may encounter fertility challenges and, upon achieving pregnancy, face a higher risk of certain complications. After age 35, the risk of health issues such as gestational diabetes and genetic abnormalities becomes more prevalent; yet, improved prenatal care enables several older pregnant women to achieve safe pregnancies (Cavazos-Rehg, P.A, et al. 2015; Nanda, K, R, 2025).

The administrative division for women in her vicinity plays a crucial role in facilitating a minimum of four antenatal care visits. The proportion of pregnant women who attended a minimum of 4 ANC visits is highest in Rangpur Division (62%), followed by Khulna Division (60.0%), and Dhaka Division (53.6%). The proportion of pregnant women who attended a minimum of four ANC visits was lowest in Sylhet Division (37%), succeeded by Chittagong Division (40.5%). The association between ANC visits and administrative divisions is statistically significant.

In terms of residency, a greater proportion of pregnant women in urban regions (59.3%) attended at least four antenatal care appointments compared to their rural counterparts (42.5%). The association between residential location and antenatal care visits among pregnant women is statistically significant.

The percentage of pregnant women attending a minimum of four antenatal care visits rises with higher levels of education. Only 20.7% of illiterate pregnant women attended a minimum of four antenatal care (ANC) appointments, around 51.5% of those with secondary education attended at least four ANC visits, and over 70.7% of women with higher education had a minimum of four ANC visits during their pregnancy. The relationship between the education of pregnant women and antenatal care visits is statistically significant.

The wealth index indicates that the percentage of women receiving a minimum of four antenatal care visits rises with an increase in wealth index. Merely 30.8% of the most impoverished pregnant women attended a minimum of four antenatal care appointments throughout their gestation period. The proportion of women who attended a minimum of four ANC visits rose from 38.5% among economically disadvantaged women to 71.4% among affluent women. The correlation between the wealth index of pregnant women and antenatal care visits is statistically significant.

The possession of health insurance is an important component for antenatal care visits among pregnant women. Approximately 77.8% of women with health insurance attended at least four antenatal care appointments during their pregnancy, but only 48.2% of women without health insurance did so.

The educational level of the husband also affects the likelihood of pregnant women attending a minimum of four antenatal care appointments during their pregnancy. The number of at least four ANC visits is greater for husbands with higher education levels. Merely 30.1% of pregnant women with illiterate husbands attended a minimum of four antenatal care appointments. The percentages of women who attended at least four ANC visits was 38.4% for spouses with primary education, 51.9% for those with secondary education, and 72.1% for those with higher education. The association between the educational level of husbands and antenatal care visits among pregnant women is statistically significant.

The employment level and sex of the household head of pregnant women do not influence the occurrence of at least four antenatal care visits.

Table 2: Testing the association between various characteristics and the number of antenatal care (ANC) visits using a contingency table.

Characteristics	Number of ANC visits		Total	p- value
	<4	>=4		
Age				
15-19	442(52.1%)	406(47.9%)	848(100.0%)	0.259
20-24	901(51.5%)	850(48.5%)	1751(100.0%)	
25-29	647(50.0%)	647(50.0%)	1294 (100%)	
30-34	390(52.3%)	355(47.7%)	745 (100%)	
35-39	149(59.1%)	103(40.9%)	252 (100%)	
40-44	24(50.0%)	24(50.0%)	48(100.0%)	
45-49	5(62.5%)	3(37.5%)	8(100.0%)	
Division				
Barisal	315(60.0%)	210(40.0%)	525(100.0%)	0.000*
Chittagong	492(59.5%)	335(40.5%)	827(100.0%)	
Dhaka	339(46.4%)	391(53.6%)	730(100.0%)	
Khulna	205(40.0%)	308(60.0%)	513(100%)	
Mymensingh	308(51.9%)	286(48.1%)	594(100.0%)	
Rajshahi	258(49.6%)	262(50.4%)	520(1 00.0%)	
Rangpur	210(38.0%)	343(62.0%)	553(100.0%)	
Sylhet	431(63.0%)	253(37.0%)	684(100.0%)	
Place of Residence				
Urban	692(40.7%)	1007(59.3%)	1699(100.0%)	0.000*
Rural	1866(57.5%)	1381(42.5%)	3247(100.0%)	
Mother's Education				
Illiterate	241(79.3%)	63(20.7%)	304(100.0%)	0.000*
Primary	902(65.8%)	468(34.2%)	1370(100.0%)	
Secondary	1151(48.5%)	1221(51.5%)	2372(100.0%)	
Higher	264(29.3%)	636(70.7%)	900(100.0%)	
Wealth Index				
Poorest	738(69.2%)	328(30.8%)	1066(100.0%)	0.000*
Poorer	614(61.5%)	384(38.5%)	998(100.0%)	
Middle	464(46.2%)	427(53.8%)	891(100.0%)	
Richer	453(28.6%)	527(71.4%)	980(100.0%)	
Richest	289(49.6%)	722(50.4%)	1011(100.0%)	
Health Insurance				
No	2556(51.7%)	2381(48.2%)	4937(100.0%)	0.099
Yes	2(22.2%)	7(77.8%)	9(100.0%)	
Husband's Education				
Illiterate	484(69.9%)	208(30.1%)	692(100.0%)	0.000*
Primary	1020(61.6%)	637(38.4%)	1657(100.0%)	
Secondary	786(48.1%)	849(51.9%)	1635(100.0%)	
Higher	268(27.9%)	694(72.1%)	962(100.0%)	
Employment Status				
No	1589(51.3%)	1509(48.7%)	3098(100.0%)	0.445
Yes	969(52.4%)	879(47.6%)	1848(100.0%)	
Sex of the Family Head				
Male	2243(51.5%)	2114(48.5%)	4357(100.0%)	0.380

Female	315(53.5%)	274(46.5%)	589(100.0%)
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*Statistically significant

Differentials of Number of ANC Visits: Multipole Logistic Regression Analysis

Table 3 presents the multinomial logistic regression analysis aimed at identifying the factors linked to a minimum of four ANC visits. Only variables having significant associations with the number of ANC visits, as indicated in Table 2, are incorporated into the multiple logistic regression model. Whether or not the expectant mother had four or more ANC visits is considered as the dependent variable. Mothers from the Rajshahi, Mymensingh, Khulna, and Rangpur divisions had significantly higher proportions of at least four ANC visits compared to mothers from the Barishal division, with percentages of 42.6% (OR = 1.426), 60.5% (OR = 1.605), 89.3% (OR = 1.893), and 182.7% (OR = 2.827), respectively. Mothers from urban areas have 74.2% (OR = 1.742) greater odds of attending at least four ANC visits compared to Mothers from rural areas. Primary, secondary, and tertiary education levels significantly influence a minimum of four antenatal care visits (P value <0.05). Mothers with secondary and higher-level education have 46.6% (OR=1.466) and 87.4% (OR=1.874) greater chances of attending at least four ANC visits compared to illiterate mothers, respectively. Women with higher education levels exhibit a greater propensity to complete a minimum of four antenatal care appointments. Compared to mothers in the most disadvantaged economic situations, women in lower and middle-class economic conditions had a 23.9% (OR=1.239) and 65.6% (OR=1.656) more likely to attend at least four ANC visits, respectively. Richer pregnant women are 87.7% (OR=1.877) and richest mothers are 215.1% (OR=3.151) more likely to attend at least four antenatal care visits compared to those in the lowest economic situations. This research indicates a significant positive relationship between increased economic status and the completion of a minimum of four ANC visits. Husbands with secondary and higher education levels significantly influence women to attend at least four ANC appointments (p-value<0.05). The likelihood of completing ANC visits increases with the increase of women's educational attainment. Husbands with a higher education level (OR=1.849) are 84.9% more likely to have four or more ANC visits than those with no education, while husbands with secondary education (OR=1.287) are 28.7% more likely to attend at least four ANC visits compared to illiterate husbands.

Table 3. Results of the multivariable generalized linear regression analysis with Binomial log link to identify the determinants of frequency of ANC visits

Factors	Estimate	Odds Ratio	95% CI of OR		P-value
			Lower limit	Upper limit	
Division					
<i>Barisal (ref)</i>	0 ^a	1.000			
Chittagong	-0.213	0.808	0.634	1.030	0.085
Dhaka	0.177	1.193	0.928	1.536	0.169
Khulna	0.638	1.893	1.452	2.471	0.000*
Mymensingh	0.473	1.605	1.244	2.073	0.000*
Rajshahi	0.355	1.426	1.098	1.856	0.008*
Rangpur	1.039	2.827	2.176	3.682	0.000*
Sylhet	-0.114	0.893	0.692	1.152	0.383
Place of residence					
<i>Rural (ref)</i>	0 ^a	1.000			
Urban	0.298	1.742	1.644	1.856	0.000*
Mother's Education^b					
<i>No education (ref)</i>	0 ^a	1.000			
Primary	-0.590	0.555	0.403	0.754	0.000*
Secondary	0.382	1.466	1.259	1.708	0.000*

Higher	0.628	1.874	1.489	2.360	0.000*
Wealth Index^b					
Poorest (ref)	0 ^a	1.000			
Poorer	0.214	1.239	1.021	1.503	0.03*
Middle	0.505	1.656	1.353	2.029	0.000*
Richer	0.630	1.877	1.523	2.315	0.000*
Richest	1.148	3.151	2.476	4.018	0.000*
Husband's Education^b					
No education (ref)	0 ^a	1.000			
Primary	-0.115	0.891	0.726	1.092	0.268
Secondary	0.252	1.287	1.104	1.499	0.001*
Higher	0.615	1.849	1.489	2.298	0.000*

^a Set to zero because it is reference category (ref)

*Represents statistically highly significant

^bThe variables exhibiting a positive coefficient suggest that the existence of these two causative categories increases the likelihood of a higher ANC visit.

Discussion

The concern regarding ANC visit is crucial because ANC is a prerequisite for safer delivery. These ANC visits ensure safe, facility-based births and significantly enhance overall mother health. According to research, adequate ANC affects almost 60% of the relationship between a mother's educational attainment and her risk of giving birth in a hospital. Inadequate care is directly responsible for the disproportionately high incidence of maternal and newborn death in developing countries.

The study findings reveal that the number of at least four antenatal care visits among pregnant women is determined by their socioeconomic and demographic characteristics. Women of older age, wealthier economic status, residing in urban settings, possessing secondary or higher education for both mother and husband, unemployed, covered by insurance, and having come from male-headed households received more antenatal care visits than their counterparts who are younger, of lower economic status, living in rural areas, illiterate, with only primary education for both mother and husband, employed, without insurance, and from female-headed households. Women residing in urban areas, within designated administrative regions, having greater family incomes, and having a high level of education among both mothers and husbands are much more likely to receive timely and adequate antenatal care (ANC). The findings indicate that women possessing higher educational attainment exhibit greater concern for the health of pregnant women and their unborn babies compared to those with lower educational levels. Women residing in urban areas exhibit greater concern over the health risks associated with expecting mothers and their children, influenced by their education and media exposure. An elevation in economic level corresponds with a rise in the percentage of women who attended the requisite number of ANC visits. The p-value indicates a significant association between the recommended number of ANC visits and a woman's economic position. Lower-income households have financial obstacles such as transportation expenses to clinics, deductible medical fees, and the loss of daily income to attend appointments.

In contrast to other regions of the nation, the populations of Chittagong and Sylhet exhibit greater religious conservative thinking, with women generally remaining at home unless there is an imperative necessity. These traditional religious beliefs may account for the low ANC in those regions. The percentage of women obtaining the requisite number of antenatal care visits increases with the educational level of their husbands. The p-value clearly indicates a significant relationship between the husband's educational level and the minimum of four ANC visits. This may happen because spouses with higher educational attainment possess more awareness of their wives' and unborn children's health.

Conclusion

The results of the study of this study demonstrate that Bangladesh fails to sufficiently adhere to the WHO's guidelines on the minimal number of antenatal care visits and the essential components of such visits. This study identified the socio-economic and demographic characteristics significantly linked to the minimal number of antenatal care visits and the acquisition of critical antenatal care services in Bangladesh. The administrative division, residential location, maternal education level, socioeconomic position, and partner's education level greatly affect the likelihood of pregnant women in Bangladesh attending four or more antenatal care appointments. The administrative division, residential location, maternal education level, socioeconomic position, and partner's education level significantly influence the chance of pregnant women in Bangladesh attending four or more antenatal care appointments. The correlation between poor socio-economic position and reduced frequency of prenatal care visits suggests that poverty serves as an impediment to obtaining sufficient antenatal services. Mothers in rural regions and some administrative districts may not be utilizing ANC services optimally, maybe due to their poor socioeconomic status and limited accessibility. The data clearly indicates a lower frequency of ANC visits in the Barisal, Sylhet, and Rajshahi divisions, underscoring the necessity for region-specific policy formulation.

The results of this study show that Bangladesh does not adequately comply with the WHO's recommendation on the minimum number of ANC visits and the necessary components of those visits. This investigation revealed the socio-economic and demographic factors that are significantly associated with the number of ANC visits and the receipt of essential components of ANC services in Bangladesh. The administrative division, place of residence, education level of mothers, number of children, wealth status, and partner's education level significantly influence the likelihood of pregnant women in Bangladesh pursuing four or more ANC visits. The association between low socio-economic status and reduced frequency of ANC visits indicates that poverty acts as a barrier to accessing adequate antenatal care. Mothers from metropolitan areas and specific administrative districts may not be using ANC services as effectively as they should, which could be related to their low socioeconomic position and accessibility. It is evident from the data that less ANC visits and ANC content items were received in the Barisal, Sylhet, and Rajshahi divisions, which emphasizes the need for region-specific policy development. The predictors of ANC visits found in this study would facilitate the achievement of the Sustainable Development Goals (SDGs), particularly the third goal, "Good Health and Well-Being."

This study suggests that the WHO-recommended minimum number of antenatal care visits and the essential components of these visits during pregnancy are not being implemented in Bangladesh. Notwithstanding considerable endeavors by the government and non-governmental groups to advocate for safe motherhood and ensure universal access to recommended antenatal care, Bangladesh remains distant from realizing this objective. Maternal healthcare systems in this resource-constrained nation have several challenges, including restricted accessibility, unfairness, inadequate public health facilities, a deficiency of skilled workers, and insufficient finance.

Suggestions

To enhance the accessibility of competent maternal care, public media campaigns emphasizing the benefits of frequent attendance at antenatal care (ANC) and compliance with its recommended components should be intensified. The ANC program in Bangladesh must be updated to align with the latest WHO standards, which advocate for a minimum of eight ANC visits and comprehensive ANC content, to substantially enhance maternal and child health. Utilizing public or NGO health facilities and procuring ANC services from qualified practitioners correlates with a greater number of ANC visits.

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