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**Factors Determining the Present Status of At least One Quality Antenatal Care Practice Amongst Bangladeshi Women**

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**Abbreviations**

IUB- Independent University of Bangladesh

ANC–Antenatal Care

WHO- World Health Organization

SDG–Sustainable Development Goals

APNCU- Adequacy of Prenatal Care Utilization

OR - Odds Ratios

CI - Confidence Intervals

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**Abstract**

**Background:** Accomplishing quality ANC visits is a vital part to strengthening a country's health system. It has played a focal role in improving the health care of mothers and children simultaneously. One of the revelatory features of quality antenatal care was determined based on the uptake of antenatal care service where quality was measured according to certain criteria.

**Objectives:** This study was conducted to determine the factors associated with the uptake of at least one quality ANC service among Bangladeshi mothers. The study was aimed to build awareness in the importance of ANC checkup, and improving quality of ANC practice in mothers of Bangladesh.

**Methods:** A nationally representative survey data obtained from the Bangladesh Demographic and Health Survey 2017-18 (BDHS-2017) was used for this study. Multivariable logistic regression models were used to analyze a sample of 4933 mothers to examine the influence of socio-demographic and other related variables on ANC practice. Mothers who have or has not taken at least one ANC service were examined along with the quality.

**Results:** About 92% of the mothers have taken up at least one ANC service. A higher educated mother has 1.8 times higher odds compared to that of a mother with no education (OR=1.780, p<0.001), and non- working mothers are more likely to take up minimal ANC service than the working mother. Mothers exposed to media outlets (TV) are more likely to take up ANC service compared to who were not exposed.

**Conclusion:** Antenatal care visits and its quality are greatly influenced by the mother's demographic, and behavioral surroundings. In this regard, awareness should be emphasized on educating mothers about the program as well as service providers.

Key words: *antenatal care, 1st visit ANC, quality ANC*

**Factors Determining the Present Status of At Least One Quality Antenatal Care Practice Amongst Bangladeshi Women**

1. **Introduction**

Antenatal care (ANC) is a means to identify high-risk pregnancies and educate women so that they might experience a healthier delivery and outcome(McNellan *et al.*, 2019). It provides a base for important health-care functions; examples of which are health promotion, screening and diagnosis, and disease prevention through its continuous process. It has been established that by implementing proper evidence-based practices timely, ANC can save lives. Essentially, ANC also provides means to interact with physically and support women, families and communities during a crucial time in the course of a mother’s life. The overall procedure of developing these recommendations on ANC, has highlighted the significance of providing effective communication about physiological, biomedical, behavioral and sociocultural issues that need to be addressed and effective support to pregnant women in a respectful way. It includes not only providing nutrition and care but also detection and management of maternal and fetal complications during ANC period which are key for improving lives, health-care utilization and quality of care(Kaur *et al.*, 2018).

According to WHO’s new recommendation, pregnant women should have at least eight contacts with the health care providers (Tunçalp *et al.*, 2017). These are having their first contact during the first 12 weeks’ gestation, and the next consecutive contacts at 20th, 26th, 30th, 34th, 36th, 38th, and 40th weeks of gestation. As the number of contacts increases, the satisfaction of the mother also increases(Sarker *et al.*, 2020). But in developing countries like Bangladesh, it is very challenging to satisfy the mother by increasing the number of visits alone as there are limited resources.

Quality is the degree to which services confirm to its intended design (process), the one that provides service at an acceptable cost, and the capacity to satisfy the need of the client or patient(Berehe and Modibia, 2020). It is the most important issue and the main predictor variable in developing as well as developed countries to achieve the SDGs (Berehe and Modibia, 2020). However, quality is very difficult to define due to the nature of its complexity and it is very challenging to measure directly.

According to Beeckman et al., the APNCU (Adequacy of Prenatal Care Utilization) index was not an effective measure of quality of ANC as this tool focused only on the time of initiation of ANC and the number of received visits. According to the author, ANC should measure not only the time of initiation of care and number of visits but also the content of care given during the visits regardless of their parity and level of risk. Antenatal care research is currently focusing on the quality of antenatal care provided because trends have exposed quality of care as an equal or greater predictor than adequacy of care for usage of ANC services. Prioritizing ANC visits will allow to take preventive measures of pregnancy-related problems and require monitoring of the content as well as the quality of ANC.

The Donabedian model is universally accepted and has been widely used in the literature especially for the development of quality standards(Ebert *et al.*, 2017). It correlates three interconnected components of quality: structure, process, and outcomes. The definition of quality was adapted based on the frameworks of the Donabedian model. Since “structure” is mainly considered as the channel through which care takes place and “satisfaction” is a result of care rather than true components of quality of care, the focus of this study was therefore on attributes of quality. According to WHO, the standard quality of ANC is comprised of three components: the first one is assessment (that is, history taking, physical examination, and laboratory tests), the second one is health promotion (that includes nutrition advice, planning the birth, information regarding pregnancy, subsequent contraception and breastfeeding, and immunization), and the last one is care provision (that is comprised of tetanus toxoid immunization, psychosocial support, and recordkeeping)(Islam and Masud, 2018). There is a variation of strategies about the content of ANC in different countries, but WHO recommends a core set of services which include blood pressure measurement, tetanus toxoid vaccination, urine testing, iron tablet supplementation, body weight measurement, and counseling about danger signs. It is believed that all these components are covered when taking up ANC service, whether it’s the 1st, 2nd, 3rd or 4th one. Therefore, we can assume that quality has been covered during the mother’s first ANC visit and run statistical analysis based on which mothers have or have not taken up ANC services.

In most developing countries, abundance of women doesnot receive the minimum four visits and the compliance to a minimal ANC service appeared to be unmet due to several factors like poor accessibility and availability, poor provider-client interaction, and lack of facility resources. Individual socioeconomic and reproductive characteristics may also play a role, like educational level, household, wealth, religion, parity, age, and marital status. Studies in Bangladesh have examined factors associated with ANC utilization using a cross-sectional study design. However,these studies mainly focused on the quantitative coverage of ANC visits, blurring the content and quality of ANC visits. Previous studies have shownthat the components covered by ANC visits influence the effectiveness of ANC services. The content and therefore the quality of care may remain insufficient while the individual coverage of ANC visits could be observed to be high. Therefore, the main aim of this study was to determine the quality of ANC service and associated factors in Bangladesh according to BDHS 2017 Data.

It is vital to conduct this research as there is not much study that describes the level of ANC quality using longitudinal study in Bangladesh. This study may help guide in designing quality-based interventions, in the building of ANC quality at health facilities, and could serve as a source of information to develop an action plan for others who are working in the area of maternal and child health-related programs.

This paper seeks to conduct a study to determine the presentstatus of at least one quality antenatal care practice amongst Bangladeshi women. Specific objectives are to conclude the current level of knowledge about antenatal care practice and identify factors related to the current usage of antenatal care. The study hypothesizes that women’s education, division they are hailing from, and place of delivery and birth order are significantly associated with the gaps in ANC visits.

1. **Materials and Methods**

This thesis is based on secondary data from the standard Demographic and Health Survey (DHS) collected nationally in Bangladesh 2017-18. The survey was conducted in four phases by Mitra and Associates under NIPORT (National Institute of Population Research and Training) of the Ministry of Health and Family Welfare with financial support USAID. Bangladesh Demographic and Health Survey (BDHS) 2017-18 is the eights in a series of DHS that was undertaken in Bangladesh. The BDHS is a vital source of records on socio-economic status, demographic information, marriage, usage of antenatal care service, fertility preference and regulation, women empowerment, and health-seeking related information.

BDHS-2017 is a cross-sectional survey that is represented nationally. The survey used a two-stage stratified sampling design, and data collection was done over the duration of six months, from June 2017 to November 2017. A total of 20,376 ever-married women age 15-49 were selected, and with a 98.4% response rate, a total of 20,127 interviews were successfully conducted. This study incorporated only the women who had given birth three years preceding the survey and within the age group of 15-49 years old.

To determine the current status of at least one quality ANC service taken, mothers who have made at least one ANC visit were taken as the dependent variable. Consideration of this visit to be of quality based on the above-mentioned factors of quality according to WHO were done. As for the independent variables using BDHS 2017, they are as follows: division, place of residence, socioeconomic status, woman’s age, educational level, currently working, read newspaper or magazine, watching TV, listening to Radio, healthcare facilities, ANC, birth order and place of delivery.

1. **Statistical analysis**

A descriptive analysis (sample, frequency percentage, mean, standard deviation) was calculated individually for the dependent and all selected independent variables. Estimation of the number and percentage for the binary variables were done. As for the continuous variable, mean and standard deviation was calculated as a measure of descriptive analysis. The confirmation of at least one quality antenatal care service was calculated using frequency and percentage.

A Chi-square test was performed to see any significant difference among the categories of each variable with the dependent variable and independent variables. Finally, multivariate analysis was performed within the age group, division, residence, education, media exposure, birth order, current working status, wealth Index, whether ANC was taken or not, and ANC place by logistic regression model to find the most dominant factors for at least one quality ANC visit. This study included the logistic regression model factors that were found to be statistically significant 95% CI (p<0.05). The data were analyzed using statistical package STATA (version 14).

1. **Results**

**Frequency distribution of the selected socio-demographic and other selected characteristics of women who has given birth three years preceding the survey and women who has taken at least one ANC service (N = 4933) shown in the Table 1.**

|  |  |  |  |
| --- | --- | --- | --- |
| **Indicators** | **Received no ANC**  **N (8.09%),**  **n=399** | **Received at least one ANC**  **N (91.91%),**  **N= 4534** | **P- value** |
| **Age group in years** |  |  |  |
| (15-19) | 51(12.78) | 795 (17.53) |  |
| (20-24) | 145 (36.34) | 1602 (35.33) |  |
| (25-29) | 98 (24.56) | 1193 (26.31) |  |
| (30-34) | 65 (16.29) | 677 (14.93) | 0.007 |
| (35-39) | 31 (7.77) | 220 (4.85) |  |
| (40-44) | 7(1.75) | 41 (0.90) |  |
| (45-49) | 2 (0.50) | 6 (0.13) |  |
| **Division** |  |  |  |
| Barisal | 70 (17.54) | 454 (10.01) |  |
| Chittagong | 72 (18.05) | 748 (16.50) |  |
| Dhaka | 48 (12.03) | 682 (15.04) |  |
| Khulna | 17 (4.26) | 494 (10.90) | 0.001 |
| Mymensingh | 56 (14.04) | 538 (11.87) |  |
| Rajshahi | 24 (6.02) | 495 (10.92) |  |
| Rangpur | 24 (6.02) | 529 (11.67) |  |
| Sylhet | 88 (22.06) | 594 (13.10) |  |
| **Place of residence** |  |  |  |
| Urban | 86 (21.55) | 1611 (35.53) | 0.001 |
| Rural | 313 (78.45) | 2923 (64.47) |  |
| **Highest education level** |  |  |  |
| No Education | 82 (20.55) | 222 (4.90) |  |
| Primary | 180 (45.11) | 1187 (26.18) | 0.001 |
| Secondary | 128 (32.08) | 2234 (49.27) |  |
| Higher | 9 (2.26) | 891 (19.65) |  |
| **Wealth index** |  |  |  |
| Poorest | 191 (47.87) | 874 (19.28) |  |
| Poorer | 106 (26.57) | 889 (19.61) |  |
| Middle | 55 (13.78) | 830 (18.31) | 0.001 |
| Richer | 37 (9.27) | 942 (20.78) |  |
| Richest | 10 (2.51) | 999 (22.03 |  |
| **Husbands’ education level** |  |  |  |
| No Education | 120 (30.08) | 559 (12.33) |  |
| Primary | 191 (47.87) | 1466 (32.33) | 0.001 |
| Secondary | 77 (19.30) | 1558 (34.36) |  |
| Higher | 11 (2.76) | 951 (20.97) |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **Indicators** | **Received no ANC**  **N (8.09%),**  **n=399** | **Received at least one ANC**  **N (91.91%),**  **N= 4534** | **P- value** |
| **Birth Order** |  |  |  |
| 1 | 80 (20.05) | 1790 (39.48) |  |
| 2 | 115 (28.82) | 1503 (33.15) | 0.001 |
| 3 | 93 (23.31) | 754 (16.63) |  |
| 4+ | 111 (27.82) | 487 (10.74) |  |
| **Respondents’ employment status** |  |  |  |
| Not Working | 217 (54.39) | 2872 (63.34) | 0.001 |
| Working | 182 (45.61) | 1662 (36.66) |  |
| **Place of Delivery** |  |  |  |
| Home | 352 (88.22) | 2081 (45.90) |  |
| Public Hospital | 24 (6.02) | 725 (15.99) |  |
| Private | 21 (5.26) | 1511 (33.33) | 0.001 |
| NGO & Others | 2 (0.51) | 217 (4.79) |  |
| **Reading Newspaper** |  |  |  |
| No | 391 | 3994 | 0.001 |
| Yes | 8 | 540 |  |
| **Listening to Radio** |  |  |  |
| No | 397 | 4246 | 0.001 |
| Yes | 2 | 288 |  |
| **Watching TV** |  |  |  |
| No | 277 | 1603 | 0.001 |
| Yes | 122 | 2931 |  |
| **Mean Age** | 24.96 |  |  |
| **Antenatal Visits During Pregnancy (SD)** | 3.93 |  |  |

Table 1 shows the descriptive statistics, proportion and chi-square test of at least one ANC visit among different categories. Out of 4,933 mothers who gave birth in the three years preceding the survey, 4534 (92%) had at least one quality ANC visit. The average age of the mother was 24.96 years and (SD=±3.93). Mothers between the age of 30-34 years old were found to be 15% significant. The highest number of mothers who received at least one ANC was found in Khulna division with 11% significance. More urban women (36%) than rural women who have had at least one antenatal care visit were significant. Primary educated mothers were found to be significant at 32%.The frequency of ANC visits varies according to the level of education. It was observed that the mothers who have taken at least one ANC was significant amongst the middle class at 18% and who were currently notworking (63%) than those who were working which are statistically significant. It was found significant that(89%) and (94%) did not read newspaper or listen to the radio. However about (62%) have been seen to watch TVs. Women with birth order having two children (33%) had a higher prevalence of taking ANC than women with more than two or more children which are statistically significant. A significance was seen in mothers who had delivery at private facilities at 33%.

**Table 2: Socio- demographic Characteristics**

|  |  |  |
| --- | --- | --- |
| **Indicator** | **Frequency (n)**  **N=4933** | **Percentage** |
| **Age group in years** |  |  |
| (15-19) | 846 | 17.15 |
| (20-24) | 1,747 | 35.41 |
| (25-29) | 1,291 | 26.17 |
| (30-34) | 742 | 15.04 |
| (35-39) | 251 | 5.09 |
| (40-44) | 48 | 0.97 |
| (45-49) | 8 | 0.16 |
| **Division** |  |  |
| Barisal | 524 | 10.62 |
| Chittagong | 820 | 16.62 |
| Dhaka | 730 | 14.8 |
| Khulna | 511 | 10.36 |
| Mymensingh | 594 | 12.04 |
| Rajshahi | 519 | 10.52 |
| Rangpur | 553 | 11.21 |
| Sylhet | 682 | 13.83 |
| **Place of residence** |  |  |
| Urban | 1,697 | 34.4 |
| Rural | 3,236 | 65.6 |
| **Highest education level** |  |  |
| No education | 304 | 6.16 |
| Primary | 1,367 | 27.71 |
| Secondary | 2,362 | 47.88 |
| Higher | 900 | 18.24 |
| **Wealth index** |  |  |
| Poorest | 1,065 | 21.59 |
| Poorer | 995 | 20.17 |
| Middle | 885 | 17.94 |
| Richer | 979 | 19.85 |
| Richest | 1,009 | 20.45 |
| **Husbands’ education level** |  |  |
| No education | 679 | 13.76 |
| Primary | 1,657 | 33.59 |
| Secondary | 1,635 | 33.14 |
| Higher | 962 | 19.5 |
| **Respondents’ employment status** |  |  |
| No | 3,089 | 62.62 |
| Yes | 1,844 | 37.38 |
| **Reading Newspaper** |  |  |
| No | 4,385 | 88.89 |
| Yes | 548 | 11.11 |

|  |  |  |
| --- | --- | --- |
| **Indicator** | **Frequency (n)**  **N=4933** | **Percentage** |
| **Listening Radio** |  |  |
| No | 4,643 | 94.12 |
| Yes | 290 | 5.88 |
| **Watching TV** |  |  |
| No | 1,880 | 38.11 |
| Yes | 3,053 | 61.89 |
| **All media Exposure** |  |  |
| No | 1,763 | 35.74 |
| Yes | 3,170 | 64.26 |
| **Place Of delivery** |  |  |
| Home | 2433 | 49.32 |
| Public | 749 | 15.18 |
| Private | 1532 | 31.06 |
| NGO & Others | 219 | 4.44 |
| **Birth Order** |  |  |
| One | 1,870 | 37.91 |
| Two | 1,618 | 32.8 |
| Three | 847 | 17.17 |
| Four | 598 | 12.12 |
| **Antenatal Care Practice** |  |  |
| No ANC received | 399 | 8.09 |
| At least one ANC received | 4,534 | 91.91 |
| **Age of the respondent’s**  **Mean (SD)** | 24.96 | 5.56 |
| **Antenatal visits during pregnancy**  **Mean (SD)** | 3.93 | 2.88 |

**Table-2 shows the socio-demographic factors pertaining to pregnant mothers.**

Respondents are from 8 administrative divisions. Although the percentage is disseminated amongst all 8 divisions, most mothers hailed from Chittagong(16.6%), followed by Dhaka (14.8%) and Sylhet (13.8%) divisions. Among the respondents, 65.6% reside in a rural area, while 34.2% reside in urban area and almost half of them (49.32%) had home delivery of their child. It is also seen that mothers gave more emphasis regarding their first child (38%), which decreased gradually as the number of parities increased. Respondents in exposure with media are 64.3%, while 35.7% are not in direction with media. In the case of the wealth index, we can see all the groups have almost similar distribution while poorest has the maximum 22% respondents and middle class consists of the lowest 18%.

**Regression models**

A multivariable logistic regression model was considered for assessing mothers who have had at least one ANC visit. Here dependent variable is whether ANC was taken or not taken and the independent variables are mother’s age, division, place of residence, education, wealth index, husband’s education, employment status, sex of household head, birth order, place of delivery, and exposure to media. Estimates of model parameters and corresponding p-values, and 95% confidence intervals are shown in Table 3.

**Table 3: Estimates of the association between ANC received and selected independent variable. A Multivariate analysis-**

|  |  |  |  |
| --- | --- | --- | --- |
| **Indicators** | **OR** | **95% CI of OR** | **P-value** |
| **Age group in years** *(ref. 15-19 years)* |  |  |  |
| (20-24) | 0.89 | 0.599-1.327 | 0.570 |
| (25-29) | 1.52 | 0.939-2.444 | 0.089 |
| (30-34) | 1.87 | 1.072-3.252 | 0.028 |
| (35-39) | 1.71 | 0.884-3.300 | 0.111 |
| (40-44) | 1.55 | 0.543-4.401 | 0.415 |
| (45-49) | 0.73 | 0.114-4.675 | 0.740 |
| **Division** *(ref. Barisal)* |  |  |  |
| Chittagong | 1.27 | 0.863-1.863 | 0.226 |
| Dhaka | 1.16 | 0.753-1.801 | 0.494 |
| Khulna | 2.38 | 1.332-4.255 | 0.003 |
| Mymensingh | 1.67 | 1.115-2.516 | 0.013 |
| Rajshahi | 2.12 | 1.270-3.550 | 0.004 |
| Rangpur | 3.42 | 2.047-5.714 | 0.001 |
| Sylhet | 1.25 | 0.856-1.840 | 0.244 |
| **Place of residence** *(ref. Urban)* |  |  |  |
| Rural | 0.91 | 0.686-1.216 | 0.535 |
| **Highest education level** *(ref. No Education)* |  |  |  |
| Primary | 1.86 | 1.329-2.612 | 0.001 |
| Secondary | 2.41 | 1.650-3.530 | 0.001 |
| Higher | 4.07 | 1.817-9.124 | 0.001 |
| **Sex of Household head** *(ref. Male)* |  |  |  |
| Female | 0.94 | 0.661-1.341 | 0.740 |
| **Wealth index** *(ref. Poorest)* |  |  |  |
| Poorer | 1.17 | 0.878-1.564 | 0.281 |
| Middle | 1.49 | 1.038-2.143 | 0.031 |
| Richer | 1.92 | 1.245-2.962 | 0.003 |
| Richest | 3.76 | 1.813-7.807 | 0.001 |
| **Indicators** | **OR** | **95% CI of OR** | **P-value** |
| **Husband’s education level** *(ref. No Education)* |  |  |  |
| Primary | 1.01 | 0.761-1.344 | 0.938 |
| Secondary | 1.53 | 1.070-2.176 | 0.020 |
| Higher | 2.18 | 1.076-4.411 | 0.031 |
| **Respondent’s employment status** *(ref. No)* |  |  |  |
| yes | 0.99 | 0.777-1.253 | 0.913 |
| **Reading Newspaper** *(ref. No)* |  |  |  |
| Yes | 1.19 | 0.558-2.528 | 0.656 |
| **Listening Radio** *(ref. No)* |  |  |  |
| Yes | 4.79 | 1.155-19.880 | 0.031 |
| **Watching TV** *(ref. No)* |  |  |  |
| Yes | 1.64 | 1.255-2.134 | 0.001 |
| **Place Of delivery** *(ref. Home)* |  |  |  |
| Public | 2.92 | 1.883-4.540 | 0.001 |
| Private | 4.34 | 2.725-6.915 | 0.001 |
| NGO & Others | 8.15 | 1.985-33.462 | 0.004 |
| **Birth Order** *(ref. One)* |  |  |  |
| Two | 0.67 | 0.466-0.955 | 0.027 |
| Three | 0.45 | 0.294-0.697 | 0.001 |
| Four | 0.34 | 0.210-0.566 | 0.001 |

Table 3, it is seen mothers between the age of 30-34 years old receive at least one ANC service has 1.8 times higher odds (OR= 1.87, p < 0.028) than mothers of 15- 19 years of age followed by mothers of age 35- 39 years old who have 1.7 higher odds(OR= 1.71, p < 0.111) than mothers of age 15- 19 yrs. old which is the reference value. The odds of mothers receiving at least one ANC has3 times higher odds (OR = 3.42 p < 0.001) in Rangpur division followed by Khulna at2% (OR= 2.38, p < 0.003) in comparison to Barisal which is considered the reference division here. Odds of mothers of rural dwellers have almost 1% chance of receiving ANC (OR = 0.91, p < 0.535) than that of urban residents. It is observed that mother’s education has a tremendous impact on receiving at least one ANC. A mother who has higher education has 4 times higher odds of visiting ANC facilities than a mother with no education (OR=4.07; p <0.001). The odds of richest mothers are almost 4 times higher (OR= 3.76 p < 0.001) and the odds of rich mothers is 2 times higher (OR= 1.92, p< 0.003) than the poorest mothers which is the reference group. The odds of mothers receiving ANC is at 3.4times higher in mothers who has more than 2 children compared to a child of the first birth. For place of delivery, it is seen that mothers delivering their babies at private facilities have 4 times higher odds compared to home deliveries. Also, mothers delivering publicly have 3 times higher odds in comparison to at-home deliveries. Working mothers are 1time higher odd to take at least one ANC than non-working mothers (OR= 0.99, p <0.913). Additionally, husbands’ education level does not have much of a role in ANC visits. Mothers exposed to media with the frequency of access to radio, television, newspaper combined are more likely to give their children all three doses than those not exposed.

1. **Discussion**

In this study, socio- demographic factors, mothers and community level factors were taken into consideration as determinants of at least one antenatal care taken of quality amongst mothers of Bangladesh. This study differed from others that were implemented in Bangladesh in that it considered community related variables and used binary logistic regression model with robust standard error estimates which were used to determine the quality of antenatal care. This analysis was helpful to accumulate the association of community related variables with at least one ANC visit to design more effective policies, define appropriate intervention and reduce community-based inequalities in accessing ANC services. Most importantly, this study was conducted to emphasize on and improve quality of antenatal care visits. Candidate predictors of the multivariable binary logistic regression model were those significantly associated with completing at least one ANC visit from the bivariable analysis at 92%. From the final multivariable model, the variables highest level of education of the woman, region, place of delivery and birth order of the child quality of received ANC were related with ANC service taken at least once in Bangladesh. The result showed that as women’s educational level increases the likelihood of taking up ANC visits also increases. This result could be due to the fact that education is an indicator of various other factors associated with health seeking behavior. It could be reasonable to say that educated women as compared to uneducated, have better access to information, possess a level of health literacy that could empower them to exercise their choice, and are able to overcome cultural barriers of ANC service utilization. Furthermore, education changes the process of logical thinking and expectation of a woman and her significant others towards traditional gender norms and role. Lack of education leads to poor quality interactions between a pregnant and service providers consequently discouraging utilization of ANC services. The study suggested that mothers in Bangladesh should be educated about ANC utilization to increasing uptake of services and therefore raise quality at health facilities. The result also indicated that the likelihood of taking at least one ANC visit decreased as birth order increased. This result implies that high parity women have less desire to use recommended ANC visits. This could be due to the belief that they do not need services as they have experience with pregnancy and childbirth. Besides, financial barriers related to cost and time raised from higher child dependency ratio blocks seeking ANC services for higher parity women. At individual levels, women aged 30–34 years were more likely to have visited ANC facilities at least once compared to those aged 15–19 years. This finding was consistent with the study conducted in Colombia. Women from Sylhet and Chittagong had less chances of taking up ANC at least once. This could be since unavailability of access to health services, lower economic status, lack of locally political commitment, religious issues, hostile and isolated environments, and large number of minorities in majority of areas of these regions. Urban resident women were more likely to complete at least one ANC visit as compared to rural dwellers in Bangladesh. The likelihood of visiting ANC at least once increased as household economic status rose. This result was consistent with those of studies in Vietnam, Haiti, Nigeria, and Kenya. Poverty is a formational determinant that could affect a woman’s ability to seek ANC through multiple mechanisms, including ability to identify and locate the availability of services, overcoming financial challenges, with constant geographic inaccessibility, pertaining knowledge about services, improving attitudes towards services, and ensuring quality antenatal care. Women in the community that received high quality of ANC were more likely to have visited ANC facilities at least once. The number of essential components of care received would show the quality of ANC. In our study these included whether a woman took vitamins and minerals, was informed about the signs of pregnancy complications, and received screening tests like blood pressure measurement, urine sample and blood sample taking during the first ANC visit.

1. **Strengths and Limitation**

The robust database from BDHS is a strength and ensured a sample representative of the entire country and the data were obtained from previously validated questionnaires. However, the cross-sectional nature of the BDHS complicates the determination of causality and is a limitation of the study. Some information is based on maternal recall of whether all components of quality were covered and mothers of different demographic regions with increasing age and number of children, may not remember information about their attendance at any ANC facilities at all.

1. **Conclusion**

The finding highlighted the need to improve the uptake of ANC services, early arrival in the first trimester for ANC services, and motivating mothers that begin ANC to confirm continuity. If these are ensured, it is believed that the quality will also be assured. Strategies to foster completing at least one ANC visit should focus on upgrading quality of care services at community level. Moreover, women in low economic status, high birth order, rural residence, and low educational level should be given special attention. Early age group and late age group among fertile age group women should be given special attention for the services. Women from Sylhet, and Chittagong should be given special emphasis.

**Recommendation:**

Future success in increasing quality antenatal care will require improvements in healthcare access to reach the poor and underserved populations. The success of ANC would also benefit from mothers having greater autonomic in making healthcare decisions about themselves. Some recommendation based on the study are-

• Mothers should be educated on the importance of ANC check- ups.

• Mothers should also be aware of the physical changes that are mentioned in ANC check- ups.

• Non-working mothers need more motivation and follow-up to get them more involved in taking up ANC.

• Emphasis on the importance of timely visits by the health care provider to ensure quality.

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