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Antenatal care taking behavior of Bangladeshi women

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Abstract:

Maternal health is the health of women during pregnancy, childbirth, and the postpartum period. Maternal health comprises the health of women during pregnancy, childbirth, and the postpartum period. Health problems during pregnancy may have serious consequences, not only for the woman but also for her child, her family, and her community. This paper is about the health care taking behavior during pregnancy (Antenatal Care) which is an important indicator of the utilization of Maternal Health Care Services (MHC) in Bangladesh. In our study we have focused on the factors that affect the antenatal care. In our study to define the antenatal care we paid our interest of a woman's antenatal visit, getting care from doctor, nurse, family welfare visitor (FWV), medical assistant/sub-assistant community medical officer (MA/SACMO). For this study, we used secondary data extracted from BDHS-2011, which is a national representative survey of the 15-49 years age groups women. The analysis has been carried out over 7,315 women who have fulfilled the study eligibility criteria. To see the effect of socio-economic and demographic factors on antenatal care (ANC), One way ANOVA was carried out for bivariate analysis and Generalized linear models (GLM) with log link function was carried out for multivariate analysis. In bivariate analysis it has been found that Type of place of residence, Media Exposure Educational level of Respondent, Husband/partner's education level, Region, Religion, Wealth index, Belong to NGO and Age of mother at birth has significant effect on antenatal care (ANC).

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Introduction

Bangladesh's population policy and programs have involved through a series of development phases and have undergone changes in strategies, structure, contents and goals. The government policy of providing health care is based on the principles of universal coverage and accessibility, optimum utilization and development of human resources for health, appropriate use of technology, gender equality, improvement of the quality of life, priority service for the most vulnerable groups including woman and the poor, and promotion of health as an integral part of overall socio-economic development. Although no comprehensive health policy has been formulated since independent, development of such policy is a high priority of the current administration. Private sector involvement in the health and population services is being encouraged. Women and children are more vulnerable in lower health status due to different social settings. To give birth of the healthy child, women should be taken care of with greater importance. Again the pregnancy period is relatively more important to ensure a healthy birth. Maternal health care services are now important issue in development policy. After the independence of Bangladesh, the government of Bangladesh is trying to take different steps in this regard.

Literature Review

Reproductive health is a crucial part of general health and a central feature of human development. The health of the newborn is largely a function of the mother's health and nutrition status and of her access to health care. Mrisho et al (2009) describe the perspectives and experiences of women and health care providers on the use of antenatal and postnatal services. They conducted in depth interviews with health care providers and village based informants in 8 villages of Lindi Rural and Tandahimba districts in southern Tanzania and found that women were generally positive about both antenatal and postnatal care.

Michael A. Koenig et al. (2007) observed that Bangladeshi women reported low but increasing use of antenatal care, as well as low rates of delivery in a health facility or with the assistance of a skilled provider. The study presented the overview of key findings from the 2001 Bangladesh Maternal Health Services and Maternal Mortality Survey of ever-married women aged 13-49. The study found that almost half of women reported having one or more complications during pregnancy that they perceived as life threatening; only one in three sought treatment from a qualified provider. Chowdhury RI, et al. (2007) found that younger mothers were significantly less likely to seek professional health care at the time of birth. The study was conducted to examine the factors that influence the use of maternal health services using data from the Bangladesh Demographic Health Survey, 1999-2000. The study found that the respondents living in urban areas, who had higher levels of education and lower parity and more assets visited trained health care providers more often and were more likely to use health care facilities provided by trained personnel at the time of delivery. A significant and positive impact of husband's concern about pregnancy complications on the utilization of health care services was also found here. Islam MA. Et al. (2006) found that education, economic status, whether pregnancy was wanted or not, regular visits for antenatal care, past history of breathing problems and liver diseases, and palpitation during pregnancy appear to have significant association with place of delivery in rural Bangladesh. Paul BK, et al. (2002) showed that delivery complications was the most significant factor determining the use of modern health care resources for childbirth, followed by parental education, and prenatal care. The study concluded that quick response to delivery complications and improved access

to hospitals and Trained Traditional Birth Attendants (TTBAs) could reduce the risk of infants and maternal morbidity and morbidity in rural Bangladesh.

Material and Method

This study utilizes the data from Bangladesh Demographic and Health Survey(BDHS) 2011, which was conducted from July-Dec 2011 in 5 phases under the authority of the National Institute of Population Research and Training (NIPORT) of the Ministry of Health and Family Welfare. The BDHS survey was implemented by Mitra and Associates, a private research farm located in Dhaka. Macro International Inc. of Calverton, Maryland provided technical assistance to the project as a part of its international demographic and Health Survey (DHS) program, while financial assistance was provided by the United States Agency for International Development (USAID)/ Bangladesh.

The main objectives of the 2011 BDHS are to:

1. Provide information to meet the monitoring and evaluation needs of health and family planning programs, and
2. Provide program managers and policy makers involved in these programs with the information they need to plan and implement future interventions.

The BDHS 2011 data in a nationally representative survey of 18,222 women aged 15-49 and 4,343 men aged 15-54 from 17,964 households covering 600 sample units(cluster/PSUs) throughout Bangladesh, 207 in urban area and 393 in rural areas. The sample for the BDHS 2011 data covered the entire population residing in private dwelling units in the country. The survey used the sampling frame provided by the list of census enumeration areas (CEAs) with population and household information from the 2011 population census. Bangladesh has seven administrative divisions: Barisal, Chittagong, Dhaka, Khulna, Rajshahi, Rangpur, and Sylhet. In our study Bangladesh has been divided into Western Region (Khulna, Rajshahi and Rangpur), Middle Region (Dhaka and Barishal) and East Region (Chittagong and Sylhet). Each division is subdivided into zilas, and each zila into upazilas. Each urban area in an upazila is divided into wards, and into mohallas within a ward. A rural area in the upazila is divided into union parishads (UP) and mouzas within a UP. These divisions allow the country as a whole to be easily separated into rural and urban areas. The survey is based on a two-stage stratified sample of households. In the first stage, 600 EAs were selected with probability proportional to the EA size, with 207 clusters in urban areas and 393 in rural areas. A complete household listing operation was then carried out in all the selected EAs to provide a sampling frame for the second-stage selection of households. In the second stage of sampling, a systematic sample of 30 households on average was selected per EA to provide statistically reliable estimates of key demographic and health variables for the country as a whole, for urban and rural areas separately, and for each of the seven divisions. With this design, the survey selected 18,000 residential households, which were expected to result in completed interviews with about 18,000 ever-married women (see Appendix A for the details of the sample design). In addition, in a sub-sample of one-third of the households, all ever-married men age 15-54 were selected and interviewed for the male survey. In this sub-sample, a group of eligible members were selected to participate in testing of the bio marker

component, including blood pressure measurements, anemia, blood glucose testing, and height and weight measurements.

In broad sense antenatal care may be described as the reproductive health care that a mother receives during her pregnancy and the time of delivery. From DBHS point of view antenatal care (ANC) can be assessed according to the type of service provider, the number of visits made, the stage of pregnancy at the time of visit, and information received during pregnancy. In our study to define the antenatal care we paid our interest of a woman's antenatal visit, getting care from doctor, nurse, family welfare visitor (FWV), medical assistant/sub-assistant community medical officer(MA/SACMO). In the BDHS data ANC is given as count data. For the simplicity of computation we discard the missing data. Descriptive statistics has been conducted to get an overview of the study. One way ANOVA has been used for bivariate analysis to see the association between explanatory variable and dependent variable. Generalized linear models (GLM) with log link function has been used for multivariate analysis.

Result and Discussion

In our study we have studied 7315 married women with at least one child who have completed full information in our study. Table 1 show the result of descriptive statistics. From the table it has been found that more than one third (68.3%) of the women is from rural region. From the result have seen that only 28.3 percent of the respondent hear family planning programs on radio or watch family planning programs on TV or read regarding family planning programs in newspaper magazine last few months. We have observed that 18.2% of the respondents are not educated, 29.9% respondents have studied up to primary level and 43.3% and 8.5% of respondents have studied up to Secondary and Higher level respectively. Since educated mother are more concerned to receive maternal health care, so it may be a potential determinant of taking ANC. It has also found that 40.0% respondents are poor and 19.2% and 40.8% respondents belong to middle class and rich family respectively. From the table we observe that 90.1% respondents are Muslim, and remaining 9.9% respondents are non-Muslim. Complicacy during the delivery time may also depends on the age of the mother. In our study we found that 55.4% respondent belongs to 20-30 age group.

From the results, we have seen that the average antenatal care visit for urban women is 3.51 with standard deviation 3.028 and for the rural women the average ANC visit is 1.87 with standard deviation 2.338. Thus, we may say that the mean ANC visits of urban women is about two times than that of rural women. Again, from the ANOVA table, we can say that the mean ANC visits of urban and rural women differ significantly.

We have found that the women who are exposed to mass media have the average ANC visits 3.3 with standard deviation 2.961, and for the women who are not exposed to media have the mean visit 2.03 with standard deviation 2.481. Therefore, the women who are exposed to mass media visits ANC more than that of the women who are not exposed to mass media. Again, from the p value (0.000), we may conclude that the mean visit of ANC for these two group differ significantly. The results shows very strong association between education level and number of ANC visits. We have seen that the women with higher education have on the average 5.3 visits as compared to women with no education where mean visits is just 1 visits. It has been found that the average ANC visits increases as the education level of the

respondents increases. The mean visits for the primary and secondary educated women is 1.71 and 2.84, respectively. Since the overall p value shows significant association, thus we need pair wise comparisons. Also, from the multiple comparisons, we have seen that the mean ANC visit for every group differ significantly from each other as the p-value is 0.000.

From the results, we have found that the average ANC visits is 2.33 for Muslim women and 2.97 for non-Muslim women. That is, the average ANC visits for Muslim women is less than that of non-Muslim women. It has also found that there exists highly significant association between religion and ANC visits. From the results, we have found that there exists highly significant association between wealth index and number of ANC visits.

Table:1 Frequency distribution of the covariates associate with ANC.

Variables	Category	Frequency	Percentage
Type of place of residence	Urban	2322	31.7
	Rural	4993	68.3
Media Exposure	No	5248	71.7
	Yes	2067	28.3
Educational level of Respondent	No education	1332	18.2
	Primary	2190	29.9
	Secondary	3170	43.3
	Higher	623	8.5
Religion	Others	722	90.1
	Islam	6593	40.0
Wealth index	Poor	2923	40.0
	Middle	1407	19.2
	Rich	2985	40.8
Belong to NGO	No	5325	72.8
	Yes	1990	27.2
Age of mother at birth	Age <20	2171	29.7
	Age 20-30	4049	55.3
	Age 30+	1095	15.0
Region	West region	2784	38.1
	Middle region	2081	28.4
	East region	2450	33.5
Husband/partner's education level	No education	1959	26.7
	Primary	2126	29.1
	Secondary	2194	30.0
	Higher	1036	14.2

Table 2: Average number of ANC visits with standard deviation for several categories of the selected covariates and one way ANOVA with multiple comparison.

Variables	Category	Average visits	SD	p -value	Pair wise comparisons	Pair wise p - value
Place of residence	Urban	3.51	3.028	0.000		
	Rural	1.87	2.338			
Media Exposure	Yes	3.30	2.962	0.000		
	No	2.03	2.481	0.00	No education. Vs primary	0.000
Education of Respondent	No Education	1.08	1.909		No education Vs secondary education	0.000
	Primary education	1.71	2.192		No education Vs Higher education	0.000
	Secondary education	2.84	2.624		Primary Vs Secondary	0.000
	Higher Education	5.29	3.214		Primary Vs Higher	0.000
					Secondary Vs Higher	0.000
Religion	Others	2.97	3.121	0.000		
	Islam	2.33	2.628			
Wealth Index	Poor	1.39	2.018	0.000	Poor Vs Middle	0.000
	Middle	2.02	2.370		Poor Vs Rich	0.000
	Rich	3.54	2.687		Middle Vs Rich	0.000
Belong to NGO	No	2.44	2.715	0.008		
	Yes	2.25	2.608			
Age of Mother at Birth	Age<20	2.45	2.601	0.000	Age<20 Vs Age 20-30	0.966
	Age 20-30	2.44	2.686		Age<20 Vs 30+	0.000
	30+	2.08	2.839		Age 20-30 Vs 30+	0.000
Region	West	2.70	2.598	0.000	West Vs Middle	0.000
	Middle	2.41	2.748		West Vs East	0.000
	East	2.02	2.691		Middle Vs East	0.000
Husband Education level	No education	1.30	1.947	0.000	No education Vs Primary	
	Primary	1.96	2.352		No education Vs Secondary	0.000
	Secondary	2.77	2.645		No education Vs Higher	0.000
	Higher	4.54	3.184		Primary Vs Secondary	0.000
					Primary Vs Higher	0.000
					Secondary Vs Higher	0.000

The average ANC visit is 1.39 for Poor women, 2.02 middle class women and 3.54 for rich women. To see the pair wise comparisons, we also compute least square difference (LSD). This result also show that the mean ANC visit for each group differ significantly from each other as the p-value is 0.000. The women who belongs to any NGO have the mean ANC visits 2.25 with standard deviation 2.608 and the women who does not belongs to any NGO have

the mean ANC visits 2.44 with standard deviation 2.715. From the p-value (0.008), we may conclude that the ANC visits for two groups differ significantly. For the women of aged < 20, the mean ANC visits is 2.45 with standard deviation 2.601 and the women of aged 20-30 have the mean ANC visits 2.44 with standard deviation 2.686 whereas for the respondent of aged 30+, the mean ANC visit is 2.08 with standard deviation 2.839. From the results, we see that the average ANC visits of young mother is higher from other aged group. Now, from the overall p-value (0.000), we may say that the mean ANC visits for different age group of women differ significantly. To see the pair wise comparisons, we also perform LSD. Here we get three pair wise comparisons. From the results, we can conclude that the mean of ANC visits of the women of aged < 20 does not differ significantly from that of aged 20-30 but the others differ significantly as the p-value is 0.000. The mean of ANC visits of the women of west region is 2.70 with standard deviation 2.598, whereas the mean of ANC visits of the women of middle region is 2.41 with standard deviation 2.748 and the mean ANC visits is 2.02 and standard deviation 2.691 in the east region. That is, the average ANC visits for women of west region is higher than that of both the visits of middle and east region. Again, from the results, we have seen that the overall p-value and pair wise p-value both are 0.000. Thus we can say that there exists highly significant association between region and number of ANC visits. It has been observed from the results that there exists a strong association between education level of the husband of respondents and ANC visits. The average ANC visits of the women whose husbands are non-educated is 1.30 with standard deviation 1.947, whereas the respondents whose husbands are primary, secondary and higher educated are 1.96, 2.77 and 4.54, respectively. Therefore, we may say that, on an average, the women whose husbands are highly educated visit ANC more than the others. From results, we may say that the mean of ANC visits differ significantly. From the pair- wise comparisons, we can also conclude that the mean ANC visits of all groups differ significantly. From the above discussion we have seen that place of residence, Media Exposure, Education level of Respondent, Husbands education level, Region, Religion, Wealth Index, NGO membership and Age of mother at birth are associated with ANC visits. So, we can take those variable for further analysis (Multivariate Analysis) to measure their effect on ANC visits.

Table 3 represents the regression parameter estimates ($\hat{\beta}$), exp($\hat{\beta}$), standard errors and corresponding p - values obtained by log-linear regression model on the response variable antenatal care visit (ANC) of BDHS Data 2010. It has been found that the covariate place of residence has highly significant effect (p < 0:001) on the response variable number of ANC visits. From the value of the regression parameter estimate of the covariate place of residence, we have seen that it is positively associated with the ANC visits. The positive value of the regression parameter estimate (0.307) suggest that Urban women take more ANC visit significantly than that of rural women. Again from odds ratio, we can say that the urban women have 35:8% higher rate of taking ANC visits significantly than that of rural women.

From the value of the regression coefficient of the covariate Media exposure, we see that the value is positive. The positive value of regression coefficient (0.11429) suggest that for the women who are exposed to media have more ANC visits than the women who are not exposure of media. Again, from the odds ratio (1.121) we can that the ANC visit for the women who are exposed to media is 12:1% higher than from the women who are not exposed to media and from the p-value(0.000), we have seen that the effect is highly significant. It has been seen that the regression coefficient of the covariate, NGO membership has positive (0.06098) effect on the response variable (ANC visit), which indicates that NGO

membership has positive effect on ANC visits. From the OR(=1.063) we can say that for the women who are member of any NGO, ANC visits is 6:3% higher than the women who are not belongs to any NGO and from the p-value(0.000),

Table 3: Regression parameter estimates ($\hat{\beta}$), exp($\hat{\beta}$), standard errors and corresponding p - values obtained using generalized linear model.

Variables	category	$\hat{\beta}$	exp($\hat{\beta}$) or OR	S.E($\hat{\beta}$)	p - value
(Intercept)			0.12927	0.04030	.001
place of residence	Rural(Ref.)				
	Urban	0.30666	1.3588790	0.030	.000
Media Exposure	No(Ref.)				
	Yes	0.11429	1.1210815	0.01653	.000
Belong to NGO	No(Ref.)				
	Yes	0.06098	1.0628785	0.01807	.000
Religion	Others(Ref.)				
	Islam	-0.17690	0.8378661	0.02328	.000
Region	West Bangla (Ref.)				
	Middle Bangla	-0.13065	0.8775209	0.01839	.000
	East Bangla	-0.27198	0.7618720	0.01878	.000
Respondent Education level	No Education(Ref.)				
	Primary	0.28700	1.3324197	0.03227	.000
	Secondary	0.54852	1.7306825	0.03265	.000
	Higher	0.82479	2.2814096	0.03964	.000
Husbands Education level	No Education(Ref.)				
	Primary	0.13970	1.1499300	0.02652	.000
	Secondary	0.24739	1.2806828	0.02745	.000
	Higher	0.40251	1.4955768	0.03275	.000
Wealth Index	Poor(Ref.)				
	Middle	0.12671	1.1350836	0.02548	.000
	Rich	0.40455	1.4986275	0.02354	.000
Age of respondent at Birth	age<20(ref)				
	Age 20-30	-0.03305	0.9674911	0.01749	0.059
	Age 30+	-0.07523	0.9275342	0.02633	0.004

we have seen that the effect is highly significant. It has been seen that the regression coefficient of the covariate, religion has negative effect (-0.58528) on ANC visits, which indicates that for Muslim women ANC visits is less than the women of other religion. Again from the OR(=0.838) we can say that for the Muslim women ANC visits is 16:2% lower than the women of other religion and from the p-value(0.000), we have seen that the effect is highly significant. From the covariate region, we create two dummy variables Middle region and East region considering West region as reference category. For the variable middle region, we have seen that the regression coefficient is negative. Negative value (-0.13065) suggest that ANC visits of middle region women is 12:2% (OR=0.878) lower than women of West region with highly significantly (p-value=0.000). Again, for the variable East region the regression coefficient is negatively associated and negative value (-0.272) suggest that ANC visits of the women of East region is 23:8% (OR=0.762) lower than the than women of West region and effect is highly significant since p-value is 0.000 . From the covariate, education level of respondent, we created three dummy variables primary, secondary and higher education with no-education as reference category. The variable primary education shows the positive association with the response variable. The positive value of the regression coefficient (0.287) suggest that ANC visits for primary educated women is 33:2% (OR=1.332) higher than reference category (no-education) and the effect is highly significant (p-value=0.000). The variable secondary education shows the positive association with ANC visits. The positive value of the regression coefficient (0.54852) suggest that ANC visits for secondary educated women is 73:1% (OR=1.731) higher than reference category (no education). Again from the p-value (0.000), we can say that the effect is highly significant. The variable higher education shows the positive association with ANC visits. The positive value of the regression coefficient (0.82479) suggest that ANC visits for higher educated women is 128:1% (OR=2.281) higher than reference category (no-education). Again from the p-value (0.000) we can say that the effect is highly significant. From the covariate education level of husband, we created three dummy variables primary, secondary and higher education with no-education as reference category. The variable primary education shows the positive association with the response variable (ANC visits). The positive value of the regression coefficient (0.1397) suggest that ANC visits for women with primary educated husband is 15:0% (OR=1.150) higher than that of the non-educated husband and the effect is highly significant (p-value=0.000) The variable secondary education shows the positive association with the ANC visit. The positive value of the regression coefficient (0.2806828) suggest that ANC visits for women with higher educated husband is 28:1% (OR=1.281) higher than that of the non-educated husband. Again from the p-value (0.000), we can say that the effect is highly significant. The variable higher education shows the positive association with the response variable (ANC visits). The positive value of the regression coefficient (0.4055) suggest that ANC visits for women with higher educated husband is 49:9% (OR=1.499) higher than that of the non-educated husband. Again from the p-value (0.000), we can say that the effect is highly significant.

From the covariate wealth index, we create two dummy variables middle and rich class considering poor class as reference category. For the variable middle class, we have seen that the regression coefficient on ANC visit is positive. The positive value of the regression coefficient (0.12671) suggest that ANC visits for middle class women is 13:5% (OR=1.135) higher than the poor women highly significantly (p-value=0.000). Again, for the variable rich, the regression coefficient on SBA is positive, positive value of the regression coefficient (0.40455) suggest that ANC visits of rich women is 49:9% (OR=1.499) higher than the poor women and the effect is highly significant (p-value=0.000).

From the covariate age of mother at birth, we created two dummy variables Age 20-30 and Age 30+ Considering Age < 20 as reference category. The value of regression parameter estimate of the covariate, Age 20-30, on ANC visits, we see that it is negatively associated with the response variable (ANC visits). The negatively value of regression coefficient (-0.03305) suggest that for the women of Age 20-30 have skill assistant during delivery period less than the women Age < 20. Again from the odds ratio (OR=0.967) we can say that ANC visits for the women of Age 20-30 is 3:3% lower than from the women of Age < 20. Again from the p-value we can say that the effect is significant (p-value =0.059). Again from the value of regression parameter of the covariate, Age 30+, on ANC, we see that it is negatively associated with the response variable (ANC visits). The negatively value of regression coefficient (-0.07523) suggest that the women of Age 30+ have more ANC visits than the women Age < 20. Again, from the odds ratio (OR=0.928) we can say that skill assistant during delivery period for the women of Age 30+ is 7:2% lower than from the women of Age < 20 and highly significantly (p-value=0.004). According to the bivariate analysis, it has been found that average ANC taken by urban women is 3.51 and for the rural women it is 1.87. It has been found that media exposure, NGO membership, religion, region, respondent education level, husband education level, wealth index and age of mother at birth have significant effect on ANC during pregnancy. The multivariate analysis show that place of residence has significant effect to receive ANC to avoid complication during pregnancy. Here the urban women visits ANC, 0.36 times more than the rural women and the effect is highly significant. Women who are exposed to media are 0.121 times more likely to have ANC than those who exposed to none. The women who are belongs to any NGO are 0.063 times more likely to have ANC than those who are not belongs to any NGO. The non-Muslim women are 0.163 times more likely to have ANC than the Muslim women. The women with primary, secondary and higher education level are 0.33, 0.73 and 1.28 times more likely to have ANC respectively than the women with education level no education. The women with primary, secondary and higher education level of husband are 0.15, 0.28 and 0.50 times more likely to have ANC respectively than the women with husband education level no education. Again, the women of middle and rich class are 0.135 and 0.498 times more likely to have ANC than the poor women respectively. For the covariate age of mother at birth, we have seen that the women of age group < 20 are 0.033 and 0.073 times more likely to have ANC than the age group 20-30 and 30+ respectively.

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