Evaluation of factors associated with antenatal care of women in rural and urban areas of Bangladesh

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This is to certify that Tahani Jashim worked on "Evaluation of factors associated with antenatal care of women in rural and urban areas of Bangladesh" under my supervision. I have gone through the paper. It is up to the mark and to my full satisfaction.

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Abstract

Background: Bangladesh is a country which is trying to enhance antenatal care rate as it is a vital part for both child and mother's better health. Antenatal care is essential for protecting the health of women and their unborn children. As Bangladesh still not far behind ensuring proper antenatal care of every mother, it is thought that there must be some factors associated to it both in urban and rural areas of Bangladesh

Objective: The aim of the study is to find out the factors associated with number of antenatal visits of women, age above 18 years and below 18 years in rural and urban areas of Bangladesh

Method: It is a cross-sectional study with a target population of women aged between 15-49 years of age are the target population. A total of 20,250 households were selected for the survey (6,810 in urban areas and 13,440 in rural areas) throughout the 8 divisions of Bangladesh. The data (secondary data) was collected from the BDHS 2017-2018 survey and analyzing was done using the SPSS software. A logistic regression model was done to find the association between variables.

Result: The result of this study shows many factors like division, place of residence, religion, wealth index, sex of child, child's low birth weight, respondent's currently working status, respondent's education and respondent's husband's education has association with women's getting antenatal care.

Conclusion: In conclusion, it can be said there are many factors associated with ensuring women's better antenatal care. If government takes necessary measures than it will be possible to ensure better antenatal care for all women.

Keywords: Antenatal care, factors, urban-rural, sex of child, Bangladesh, south-east Asia

Introduction:

Antenatal care is essential for protecting the health of women and their unborn children. Through this form of preventive health care, women can learn from skilled health personnel about healthy behaviors during pregnancy, better understand warning signs during pregnancy and childbirth, and receive social, emotional and psychological support at this critical time in their lives. Through antenatal care, pregnant women can also access micronutrient supplementation, treatment for hypertension to prevent eclampsia, as well as immunization against tetanus. Antenatal care can also provide HIV testing and medications to prevent mother-to-child transmission of HIV. In areas where malaria is endemic, health personnel can provide pregnant women with medications and insecticide-treated mosquito nets to help prevent this debilitating and sometimes deadly disease. Antenatal care (ANC) is widely recognized as an accessible and cost-effective method to improve maternal and perinatal health outcomes. It offers the opportunity to connect women to the health system, and improve maternal and child health outcomes through prevention, health promotion and treatment during pregnancy. ANC can increase access to and chances of using a skilled attendant at birth around labor and delivery – which is when most maternal and newborn deaths occur – through a birth and emergency preparedness plan. Studies show that attending at least four quality ANC sessions is an effective strategy to increase skilled birth attendant use and institutional delivery.

High quality prenatal or antenatal care (ANC) is an essential component of the reproductive, maternal, newborn and child health continuum of care. During the critical prenatal period, health care providers can educate women about healthy pregnancy behaviors, danger signs of complications, breastfeeding and family planning; identify and treat pregnancy-related conditions such as pre-eclampsia/eclampsia; refer mothers to specialized care when necessary; encourage the use of a skilled birth attendant; and minimize the risk of mother-to-child transmission of HIV. For many women around the world, an ANC visit is their first adult

contact with the health care system, serving as a gateway to health services both during and beyond maternity care. In addition to diagnosing and managing pregnancy-related complications, ANC provides an opportunity to screen for and treat other chronic conditions and non-communicable diseases. The newest guidelines from the World Health Organization recommend that women attend 8 ANC visits.

Globally, 85% of pregnant women attend at least one ANC visit with a skilled health professional, and 58% attend at least 4 ANC visits. However, ANC utilization varies within and among countries: One study found that the percentage of women who attended at least 4 ANC visits ranged from 18% in Guatemala to 81% in Nicaragua. A number of factors including socioeconomic status, place of residence and education level affect a woman's likelihood of attending ANC, contributing to enormous disparities in access and utilization.

The quality of care during an antenatal visit is also important. Particularly in low-resource settings, shortages in essential medicines, equipment and trained staff are barriers to providing high quality care. In addition, the content of care delivered during pregnancy is poorly measured, limiting the ability to identify and address weaknesses. Integrating ANC with other health services has the potential to improve utilization, quality and outcomes, but additional research is needed. Another approach designed to improve the quality of care is group-based ANC. Researchers in recent years have begun to assess the feasibility and acceptability of group care models such as Centering Pregnancy in diverse global settings, including Malawi and Tanzania.

Several studies conducted in developing countries on demographic and socio-cultural factors influencing use of maternal health care services, have shown that factors like maternal age, number of living children, education, place of residence, occupation, religion and ethnicity are significantly associated with use of antenatal care.16-18 One of these studies have examined

the relationship between antenatal care utilization and pregnancy outcome.16 Randomized controlled trials that assign women to different protocols have found little difference between intervention and control groups9,19, but these studies do not include populations of women with little or no antenatal care. (Nisar and White, 2003)

In south Asia, women in the urban Philippines are 0.932 times more likely than women in the rural Philippines to make ≥4 ANC visits. On the other side, women in urban Indonesia are more likely 1.255 times than women in rural Indonesia to make ≥4 ANC visits. Apart from the type of residence place (urban-rural), five other tested multivariate variables also proved significant contributions to ANC's use in both countries, i.e., age, have a husband/partner, education, parity, and wealth status.

Despite substantial progress in primary health care over the last decades, only 21% of pregnant women in Bangladesh receive at least four ANC visits, just 31% of births are delivered at health facilities, and skilled birth attendants assist only 41% of women during childbirth in Bangladesh. A lack of access to health providers and facilities has contributed to nearly three in four (73%) mothers in Bangladesh not receiving four or more ANC visits from skilled health professionals, let alone the eight 'contacts' recently recommended by the World Health Organization (WHO). Further, while 74% of urban women receive ANC from a trained provider, only 49% of rural women have such access. Improving access to quality ANC and sustaining its implementation must be prioritized for the country to achieve the health Sustainable Development Goals.(Shahjahan *et al.*, 2013) . Average unit costs of ANC service provision were about double at the facility level ($2.75) compared with community-based care ($1.62). ANC patient costs at facilities ($2.66) were about three times higher than in the community ($0.78) (Jo *et al.*, 2019). The percentage of women receiving antenatal care (ANC) from a medically trained provider has increased sharply since 2014. There has also been an increase in the percentage of women with four or more ANC visits during pregnancy, from

31% to 47%. Bangladesh aims to reach 50% coverage of at least four ANC visits by 2022 (Survey, 2017)

The purpose of this study to see what are the factors that has association with mother's antenatal care in Bangladesh

Objective:

General Objective:

The aim of the study is to find out the factors associated with number of antenatal visits of women, age above 18 years and below 18 years in rural and urban areas of Bangladesh

Specific Objectives:

- To find out the socio demographics characteristics of women, age above 18 years and below 18 years in rural and urban areas of Bangladesh.
- To compare the factors related to the number of antenatal visits of women, age above 18 years and below 18 years in rural and urban areas of Bangladesh
- To determine the factors associated with antenatal care of women, age above 18 years and below 18 years in rural and urban areas of Bangladesh

Hypothesis:

The hypothesis of this study is antenatal care of women is affected by mother's age.

Null hypothesis, H_0 = Women's age has an association with her getting better antenatal care

Alternative Hypothesis, H_A = Women's age has no association with her getting better antenatal care

If the analysis will go according to the hypothesis, then Bangladesh policy makers need to give proper attention to this matter cause lack of proper antenatal care has massive impact on both baby, mother and eventually on county

Method:

This is a cross-sectional study.

Data source:

The Data source of this study is a secondary data, which will be extracted from the 2017-2018 Bangladesh Demographic and Health Survey. The demographic and health survey 2017-18 is the18th national survey report based on the demographic and health status of women and children. It was conducted under the authority of the National Institute of Population Research and Training (NIPORT), Health education and family welfare division of the Ministry of Health. Technical assistance on verbal autopsies to determine the causes of under-5 deaths were provided by icddrb, a private research agency Mitra and Associates, collected the data from October 2017 to March 2018. Financial support for this survey was provided by United States Agency for International Development (USAID).

Study area:

The eight administrative divisions of Bangladesh, Barisal, Chattogram, Dhaka, Khulna, Mymensingh, Rajshahi, Rangpur, and Sylhet is divided into zilas and each zila into upazilas. Each urban area is divided into wards, and then words are subdivided into mohallas. Rural area is divided into union parishads (UPs) which then divided into mouzas. This division has separated the country into Urban and Rural areas. The Urban areas were then classified into two categories; city corporations and areas other than city corporations.

Sample Frame:

This survey used a list of enumeration areas (EAs) from the Population and Housing Census 2011 of the People's Republic of Bangladesh. This was used as a sampling frame named BBS 2011, provides by the Bangladesh Bureau of Statistics. This sampling frame has information about the location of EAs, type of residence (urban or rural), and the number of estimated residential households. An Enumeration Area is a village, a group of small villages, or part of a large village. A sketch map was made to locate the geographic boundaries available for each EA. The primary sampling unit of this survey was an Enumeration area with 120 households.

Figure 01: Bangladesh Map

Sample design:

The survey is based on a two-stage stratified sample of households and in the first stage, 675 Enumeration areas (EAs) were selected with probability proportional to enumeration area size. Then for the second stage selection of households in all selected EAs, a complete household listing operation was carried out to provide a sampling frame. In the second stage of sampling, a systematic sample of an average of 30 households per EA was selected. This selection provides statistically valid estimates of key variables for the country as a whole, for each of the eight divisions and for urban and rural areas separately. 20,250 residential households were then selected based on this design.

Target population:

Women aged between 15-49 years of age are the target population. A total of 20,250 households were selected for the survey (6,810 in urban areas and 13,440 in rural areas).

Variable:

Dependent Variable:

Dependent variable of this study is antenatal visit of mother. Antenatal visits present opportunities for reaching pregnant women with interventions that may be vital to their health and well-being and that of their infants. WHO recommends a minimum of four antenatal visits based on a review of the effectiveness of different models of antenatal care. The provision and uptake of quality and timely antenatal care (ANC) is an essential element of efforts to improve health outcomes for women and newborn babies. Antenatal consultations assist in early identification and treatment of complications during pregnancy.

Number of antenatal visits is the clinical assessment of mother and fetus during pregnancy. It traditionally involves several routine visits approximately 12-16 for assessment of pregnant women before and during pregnancy.

Independent Variable:

Main independent variable of this study is women's age. Some other associated independent variables are -

- Division

- Type of residence

- Religion

- Wealth index combined

- Sex of child

- Child's Low birth weight

- Antenatal visit to doctors

- Respondent's currently working status

- Respondent's education

- Respondent's husband/partners education

The study population from all of the 8 divisions of Bangladesh will be used in this study, along with the type of residence (urban, rural). It can give us a clear picture of how women from different divisions and different type of residence have what kind of association with women's antenatal visit.

Another independent variable religion, can give us a clear picture if religious point of view can affect women's number of antenatal visit. Wealth index which is a categorical variable is going to be an indicator for the socio-economic status of the respondent to show if economic stability has any effect on women's antenatal visit. The categories for wealth index are, Poorer, Poorest, Middle, Richer and Richest.

Sex of child is another independent variable with category Male and Female. This variable can give a clear view of the gender effect on women's antenatal visit. Low Birth weight is another independent variable of interest. In BDHS 2017-2018 data, child's birth weight is an important

indicator to the risk of childhood illnesses and chances of survival in future. Live births in the 5 years before the survey that have a reported birth weight from either a written record or the mother's recall is used as a sample for LBW (Low Birthweight). LBW is measured by percentage of births with a reported birth weight below 2.5 kilograms regardless of gestational age.

Respondent's level of education can be a bookmark for women's ability of decision making and taking a good care of her and future child. This variable is a categorical variable and the categories are No education, Primary Education, Secondary education and Higher education.

Lastly, respondent's husband's/partner's level of education can also be a bookmark for decision making and taking a good care of mother. This variable is a categorical variable and the categories are No education, Primary Education, Secondary education and Higher education.

Data management:

After collecting the secondary data, a subset of data will be created in respect to our selected dependent and independent variables. This will help us to specify the data according to our objective more precisely. The missing values will be excluded using the SPSS software. After the exclusion process the subset will be prepared for the statistical analysis.

Data analysis

In the study of measuring the association between women's age and number of antenatal visits, the dependent variable is number of antenatal visits. As the dependent variables are categorical (binary), so Binary Logistic Regression model will be used to analyze the result and prove the hypothesis. Along with this, a univariate analysis will be done to find the frequency and percentage of existing data. Bivariate analysis will also be done using statistical Chi-square test to find the association more precisely. These three statistical analyses will help to estimate the relationship that exists, on the average, between the dependent variable and the independent

variables. It will also help to determine the effect of each one of the explanatory independent variables on the dependent variable, controlling the effects of other independent variables at a time.

Statistical tool IBM SPSS version 25 will be used in this study. In the logistic regression model, to determine the associations between the independent variables and number of antenatal visits, odds ratio, p value and corresponding 95% confidence intervals will be calculated at 5% level of significance.

Ethical consideration:

The Ethics committee at NIPORT, Mitra and Associates, and ICF international approved a waiver from ethical approval for the retrospective study of BDHS report 2017-2018. As the data we are using for this study came from the secondary sources, that's why this study does not require ethical approval.

Result:

Descriptive analysis of respondents to 8 divisions in Bangladesh

Aim of this study is to find if there is any association of antenatal visit of women and others associate factors in Bangladesh. Findings of this study shows, respondents are highest in Dhaka division, which is 14.78% of total number of respondents. Mymensingh division has lowest number of respondents (10.77%). Barisal has 10.70% respondents of sample size 2,154 and Rangpur has 12.38%, Chittagong has 14.43%, Rajshahi has 12.80% respondents of total number of respondents.
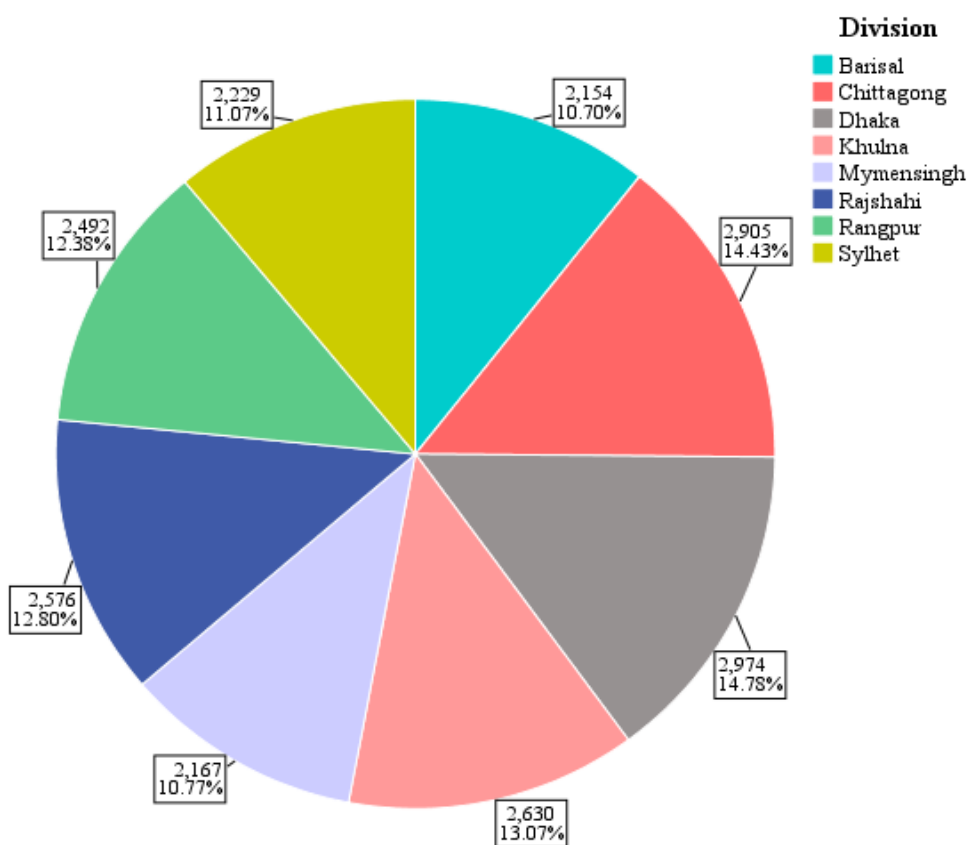
Figure 02: Distribution of respondents in 8 divisions

Descriptive analysis of respondents according to place of respondents

In this study, maximum number of respondents are from Rural areas which is 63.36% (12,753) and only 36.64% (7374) are from Urban area.
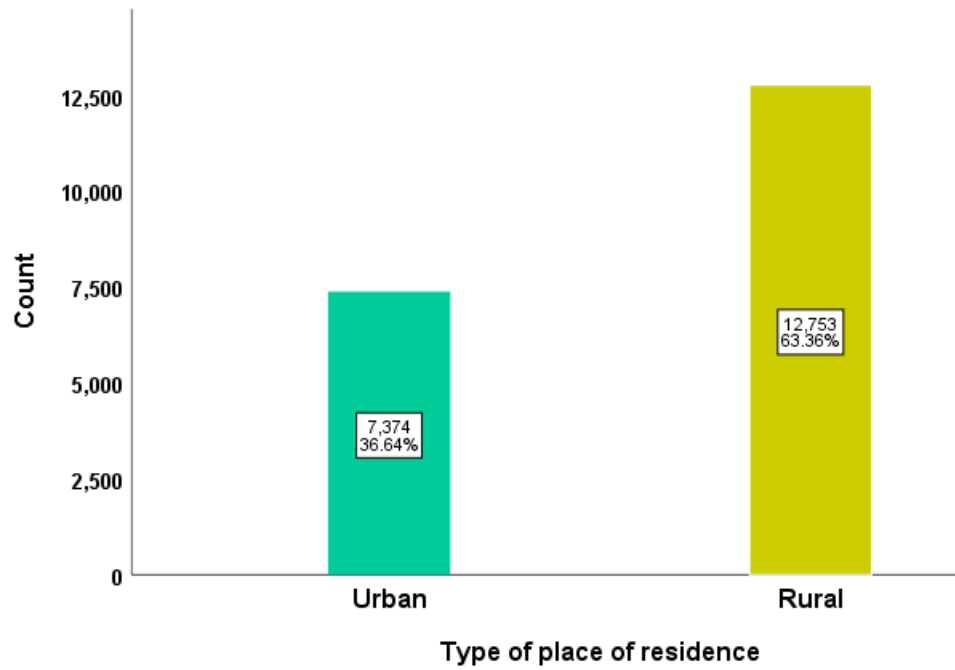
Figure 03: Distribution of respondents according to urban and rural area

Descriptive analysis of respondents according to religion

Among total 20,127 number of respondents, 90.11% (18,136) respondents are Muslim, which is highest and Christian respondents are lowest in number, 0.23% (46). Respectively Hindu, Buddhist respondents are 9.25% (1,861) and 0.42% (84).
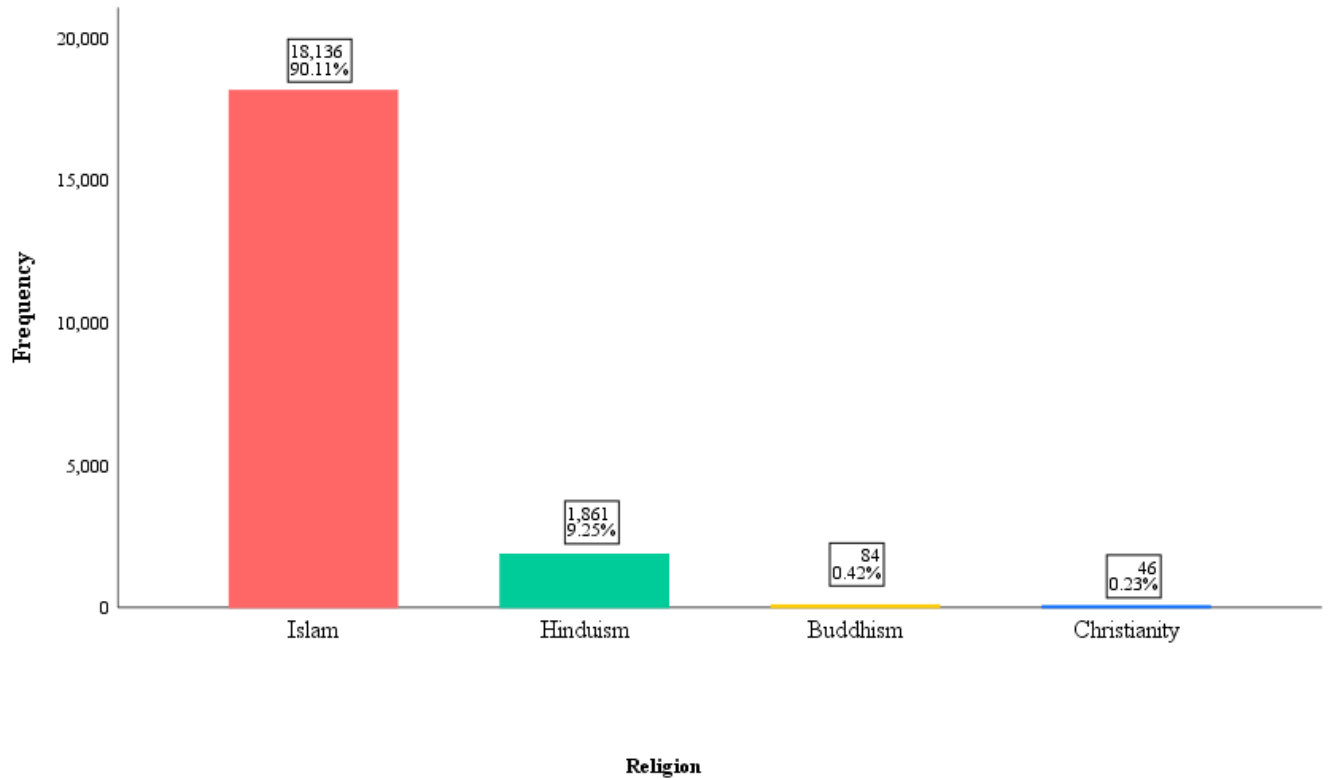
Figure 04: Frequency distribution of Religion

Descriptive analysis of respondents as per wealth index

Within total number of respondents, 19.01% (3,826) are of poorest economic status, 19.04% (3,833) are of poorer economic status. 19.29% belongs to middle income wealth index, 20.31% of Richer and 22.34% of richest economic status
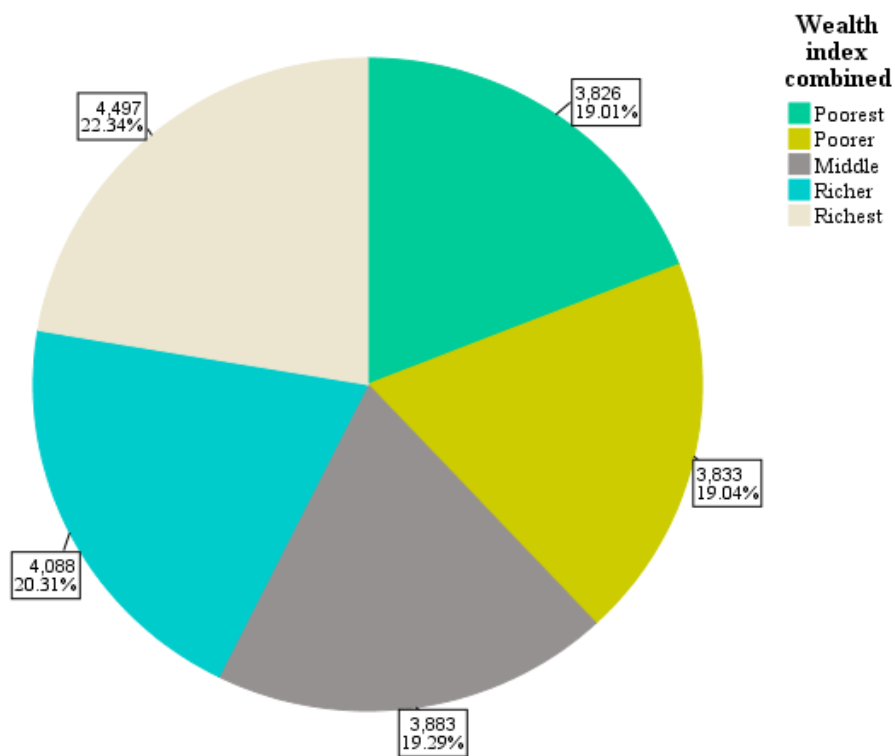
Figure 05: The distribution of wealth index of the respondents

Descriptive study of respondent's child characteristics

From table 01, descriptive analysis of respondent's child characteristics table shows information of 3 parameters – sex of child, doctor's visit for ANC and child's weight. Among respondent's children, male is 53.7% and female is 46.3%. In 75.8% cases, respondents said they visited to doctor for antenatal care when they were with child and 24.2% said they didn't. Child's weight data shows 93.2% children were of normal weight and 6.8% were of low birth weight. So, there is significant association between male child and doctor visit for antenatal care during pregnancy. And doctor's visit for ANC has association with child's weight.

Table 01: Distribution analysis of child characteristics

Variables		Frequency	Percentage (%)
Sex of Child	Male	9743	53.7
	Female	8391	46.3
Doctor's visit for ANC	No	1214	24.2
	Yes	3798	75.8
Child's Weight	Normal	4670	93.2
	Low birth weight	342	6.8

Descriptive study of respondent's characteristics

From table 02, descriptive analysis of respondent's characteristics shows information about respondent's age, respondent's current working status, highest educational level, and respondent's husband/partner's educational level. The study shows 96.8% (19,476) respondent's age is 18 and above. 3.2% (651) respondents are of age less than 18. 47.9% (9632)

respondents are currently working and 52.1% (10,495) are not. According to respondent's highest level of education information, 14% (2821) respondents has completed higher education, 38.6% (7764) has completed secondary education, 31.5% (6340) has primary education and 15.9% (3202) has no education. As per respondent's husband/partner's educational level data, 17.9% (3373) of them has higher education, secondary education got 29.5% (5579), primary education got 31.3% (5923), and 21% (3976) of respondent's husband/partner has no education.

Table 02: Descriptive analysis of respondent's characteristics

Variables		Frequency	Percentage (%)
Respondent's age	Less than 18	651	3.2
	18 and above	19476	96.8
Respondent currently working	No	10495	52.1
	Yes	9632	47.9
Respondent's highest educational level	No education	3202	15.9
	Primary	6340	31.5
	Secondary	7764	38.6
	Higher	2821	14
Husband/partner's educational level	No education	3976	21
	Primary	5923	31.3
	Secondary	5579	29.5
	Higher	3373	17.9

Bivariate analysis of respondent's socio-economic condition

For Division,

Among 8 divisions, highest number of mothers from Rangpur division has visited doctors for 4 times or more to take antenatal care during their pregnancy, which is 61.5% and from Sylhet division highest number of mothers took antenatal care less than 4 times, which is 63.2%. Association between division and number of antenatal visits is highly significant as the P value is <0.001

For Type of residence,

From our target group, highest number of mothers who live in urban area has visited doctors for 4 times or more to take antenatal care during their pregnancy, which is 59% and from rural area only 42.5% mothers have visited doctors for 4 times or more. Association between division and number of antenatal visits is highly significant as the P value is <0.001

For Religion,

Visiting doctors for 4 times or more to take antenatal care is in lowest in Muslim mothers, only 47.5% and highest in case of Christian mothers which is 66.7%. Respectively, 55.1% Hindu mothers, 61.1% Buddhist mothers took antenatal care for 4 times or more. But religion has significant association with ANC visit as P value is 0.013

For Wealth index,

Respondent mother's wealth index shows 71.3% mothers who are richest have visited doctors for 4 times or more and 69.1% of mothers who are poorest have visited doctors less than 4 times. Association between wealth index and number of ANC visit is highly significant as p value is <0.001

Table 03: Bivariate analysis between number of antenatal visits and associated variables

Variables		Antenatal Visits		P Value
		Less than 4 times (%)	4 times or more (%)	
Division	Barisal	59.8	40.2	<0.001
	Chittagong	59.5	40.5	
	Dhaka	46.7	53.3	
	Khulna	40.5	59.5	
	Mymensingh	51.7	48.3	
	Rajshahi	49.5	50.5	
	Rangpur	38.5	61.5	
	Sylhet	63.2	36.8	
Type of place of residence	Urban	41	59	<0.001
	Rural	57.5	42.5	
Religion	Islam	52.5	47.5	0.013
	Hinduism	44.9	55.1	
	Buddhism	38.9	61.1	
	Christianity	33.3	66.7	
Wealth index combined	Poorest	69.1	30.9	<0.001
	Poorer	61.9	38.1	
	Middle	52.2	47.8	
	Richer	46.2	53.8	
	Richest	28.7	71.3	

For Sex of child,

In 49.4% cases of male child, mothers have visited doctors 4 times or more to take antenatal care but for female child only 46.9% mothers have taken antenatal care for 4 times or more. This relationship is statistically not significant. (P value 0.078)

For Child's weight,

Study shows, 62.3% children have low birth weight and 47.1% have normal weight. This association is highly significant as P value is <0.001

For Doctor's visit for ANC,

55.6% mothers visited doctors for antenatal care and 75% mothers visited for less than 4 times which is highly significant (P value <0.001)

Table 04: Bivariate analysis between number of antenatal visits and associated variables of child characteristic

Variables		Antenatal Visits		P Value
		Less than 4 times (%)	4 times or more (%)	
Sex of child	Male	50.6	49.4	0.078
	Female	53.1	46.9	
Child's Weight	Normal	52.9	47.1	<0.001
	Low birth weight	37.7	62.3	
Doctor's visit for ANC	No	75	25	<0.001
	Yes	44.4	55.6	

For Respondent's age,

48.4% mothers aged 18 and above has visited doctors for 4 times or more to take antenatal care. 57.9% mothers of age less than 18 years old has taken less than 4 antenatal cares. Respondent's age doesn't have any significant association as p value is 0.068.

For Respondent's currently working,

48.7% mothers who don't work currently, visited doctors for 4 and more times, on the other hand mothers who are currently working has visited less than 4 times and their percentage is 52.8%. Respondent's working status doesn't have any significant association with number of antenatal visits as p value is 0.307

For Respondent's education,

Respondents who have higher education, has highest percentage of visiting doctors for 4 times or more to take antenatal care. On the other hand, who has no education visited has lowest percentage of taking antenatal care less than 4 times, 20.2%. This is highly significant and p value is <0.001

For Respondent's husbands/partner's education level,

Mother's husband/partner's education level data shows husband/partner who has no education visited doctors for 4 or more antenatal visit the lowest which is 20.2% and who has higher education are highest in percentage which is 72.1% and the visited for ANC less than 4 times. Respondent's husband/partner's education has highly significant association and p value is <0.001.

Table 05: Bivariate analysis between number of antenatal visits and associated variables of respondent's characteristics

Variables		Antenatal Visits		P Value
		Less than 4 times (%)	4 times or more (%)	
Respondent's age	Less than 18	57.9	42.1	0.068
	18 and above	51.6	48.4	
Respondent currently working	No	51.3	48.7	0.307
	Yes	52.8	47.2	
Respondent's education	No education	79.8	20.2	<0.001
	Primary	65.8	34.2	
	Secondary	48.5	51.5	
	Higher	29.5	70.5	
Husband/partner's education level	No education	70.1	29.9	<0.001
	Primary	61.6	38.4	
	Secondary	48.1	51.9	
	Higher	27.9	72.1	
	Don't know	61.5	38.5	

Logistic regression of respondent's socio-economic condition

Multivariate analysis for Socio-economic conditions,

Mothers who live in Sylhet and Chittagong has respectively 8% and 21.3% lower odds of having 4 times or more antenatal visits than the mother of Barisal division which is not significant as P value is respectively 0.058 and 0.533. On the other hand, mothers living in Dhaka, Khulna, Mymensingh, Rajshahi and Rangpur have respectively higher odds of having 4 times or more antenatal visit than of Barisal division, which are respectively 17.9%, 73.9%,

61.5%, 32.7% and 194.8%. But only Khulna, Mymensingh, and Rangpur as highly significant association as their P value is <0.001

Mothers who live in Rural areas have 24.8% of lower odds of having 4 or more antenatal visit than the mothers living in Urban areas. Which is highly significant as P value is <0.001

Hindu, Buddhist, and Christian mother have respectively 23.9%, 205% and 64.5% higher odds of taking 4 or more antenatal care during pregnancy than Muslim mothers. Which is significant for Buddhist as P value is 0.047 and not significant for Hindu and Christian as P values are respectively 0.07, and 0.503

Richest respondent mothers have 18.9% higher odds of taking 4 or more antenatal visit than the poorest mothers. Respectively of Richer, Middle economic status and Poorer economic status mothers also have higher odds of taking 4 or more antenatal visit than of Poorest. Among them middle, richer, richest wealth index people are highly significant and p value is <0.001

Table 06: Regression analysis of number of antenatal visits among respondent's socio-economic conditions

Variables		Logit Model		P Value
		OR	95% CI	
Divisions	Barisal	-	-	-
	Chittagong	0.787	(0.614 - 1.008)	0.058
	Dhaka	1.179	(0.913 - 1.523)	0.206
	Khulna	1.739	(1.326 - 2.282)	<0.001
	Mymensingh	1.615	(1.244 - 2.095)	<0.001
	Rajshahi	1.327	(1.016 - 1.732)	0.038
	Rangpur	2.948	(2.248 - 3.867)	<0.001
	Sylhet	0.92	(0.708 - 1.196)	0.533
Type of place of residence	Urban	-	-	-
	Rural	0.752	(0.651 - 0.869)	<0.001
Religion	Islam	-	-	-
	Hinduism	1.239	(0.983 - 1.562)	0.07
	Buddhism	3.05	(1.014 - 9.172)	0.047
	Christianity	1.645	(0.383 - 7.065)	0.503
Wealth index combined	Poorest	-	-	-
	Poorer	1.189	(0.975 - 1.449)	0.087
	Middle	1.486	(1.206 - 1.83)	<0.001
	Richer	1.605	(1.292 - 1.993)	<0.001
	Richest	2.644	(2.057 - 3.398)	<0.001

Multivariate analysis for child characteristics,

In case of female child, taking 4 or more antenatal care has 12.1% lower odds than of male child and its association is significant, p value is 0.041.

44.1% of low-birth-weight babies has higher odds of taking 4 or more antenatal visit to doctors than the babies are of normal weight. Babies weight has association with better antenatal care as p value is 0.005

137.7% of pregnant mothers has higher odds of taking 4 or more antenatal visit to doctors than who don't. It has highly significant association as p value is <0.001

Table 07: Regression analysis of number of antenatal visits among associated variables of child characteristic

Variables		Logit Model		P Value
		OR	95% CI	
Sex of child	Male	-	-	-
	Female	0.879	(0.77 -0.995)	0.041
Child's Weight	Normal	-	-	-
	Low birth weight	1.441	(1.13 - 1.839)	0.003
Doctor's visit for ANC	No	-	-	-
	Yes	2.377	(2.018 - 2.799)	<0.001

Multivariate analysis for respondent's characteristics,

Respondents who are aged 18 and above has 22.3% higher odds of taking 4 and more antenatal visit than who are of age less than 18. Age has significant association as p value is 0.194

Respondent's currently working status shows, who are currently working has 16.6% higher odd of taking 4 or more antenatal visit to doctor than who are not working. It has significant association as p value is 0.026

Respondent's education study shows, mothers who has higher education has 190% higher odds of having 4 or more antenatal visit than who has no education also higher from who has primary education. Respondents' education has significant association but secondary and higher education has highly significant association as P value is <0.001 for these two and for primary education, it is 0.001

In case of respondent's husbands/partners educational level study shows, those who has higher education has 94.6% higher odds of taking 4 or more antenatal visits for mothers during their pregnancy than who have no education or even who have primary education. Respondent's husband's primary education has no association as p value is 0.33 but who have secondary and higher education as significant where higher education has highly significant association as p value is <0.001

Table 08: Regression analysis of number of antenatal visits among associated variables of respondent's characteristics

Variables		Logit Model		P Value
		OR	95% CI	
Respondent's age	Less than 18	-	-	-
	18 and above	1.223	(0.902, 1.658)	0.194
Respondent currently working	No	-	-	-
	Yes	1.166	(1.018, 1.335)	0.026
Respondent's education	No education	-	-	-
	Primary	1.732	(1.259, 2.381)	0.001
	Secondary	2.412	(1.755, 3.314)	<0.001
	Higher	2.9	(2.016, 4.172)	<0.001
Husband/partner's education level	No education	-	-	-
	Primary	1.11	(0.9, 1.694)	0.33
	Secondary	1.357	(1.087, 2.561)	0.007
	Higher	1.946	(1.479, 3.739)	<0.001
	Don't know	1.144	(0.35, 3.739)	0.824

Discussion

The result of this study shows some interesting findings. In bivariate analysis, women from Rangpur division visits doctor more time than all other divisions and women from Sylhet division visits the least. But after fixing all other variables, multivariate analysis shows, women who are from Sylhet and Chittagong division has lower odds of visiting doctors for antenatal

care among all other divisions of Bangladesh. Women in rural areas takes lesser antenatal care than women in urban areas, and antenatal cares association with their place of residence is highly significant. This result is same in both bivariate analysis and multivariate analysis.

Bivariate analysis shows Muslim women takes least antenatal care among women of all other religions where Christian women take the most, and antenatal care has significant analysis with religion. But after fixing all other variables, multivariate analysis shows, Buddhist women take the most antenatal care, visit doctors' higher times for antenatal care but Muslim mothers has the lower odds of visiting doctors for antenatal care among all other religions. Respondents who are richest, visits doctor for most times thus takes better antenatal care than the respondents who are poorer. Wealth index's association with number of antenatal visits is highly significant.

In case of female child, bivariate analysis show, respondent women get lesser antenatal care, visits doctor lesser times for antenatal care than when it is about male child. Taking more antenatal care is higher odds when it is male child and it has significant association.

Surprisingly birthweight data in bivariate analysis shows, women who visits doctor for more antenatal visit has more low birthweight babies and who visit doctor less, has normal babies. But this has no significant association. But after fixing all other variables, multivariate analysis shows that women who visits doctor more for antenatal visit has higher odds of having low birth weight babies and it shows significant association between antenatal care and baby's birth weight.

Bivariate analysis of respondent's age shows some shocking findings. It shows women who are of age below 18, don't visit much for antenatal care, and who are above 18, even they don't visit doctor for antenatal care more times. Which is alarming but it doesn't show significant association. But after fixing all other variables, multivariate analysis shows women who are 18 years and above shows higher odds of having antenatal care. Though it

does not show significant association. Respondent's working status data study shows who are working has higher odds of taking more antenatal visit than who are not working and it has significant association.

Bivariate analysis of respondent's education and respondent's husband/partners education level data shows, if respondent and respondent's husband have higher education, respondent gets more antenatal visit. If respondent and respondent's husband have primary or no education, respondent gets lower antenatal visit. Bivariate analysis shows highly significant association between education level and number of antenatal visit. After fixing all other variables, multivariate analysis shows some interesting findings. Respondent's primary education has significant association with number of antenatal visit but secondary and higher education highly significant association with it. On the other hand, respondent's husband's primary education has no significant association with respondent's getting more antenatal visit to doctor, secondary education has significant association and higher education has highly significant association of respondent's more antenatal visit.

Limitation

Antenatal care is very important for both mother and baby. For this study we have chosen proxy variables according to BDHS 2017-2018 report, this way we might missed some important variables which could give a better finding. Another limitation could be the missing values in respect to independents variables, we might miss some important values, some other variables. There could be some errors in BDHS data entry as it is a national level survey, some could possibly be there.

Conclusion

In Bangladesh, Respondent from Sylhet and Chittagong division has lower odds of taking low antenatal care and in the rural area women take less antenatal visit than who are in urban area. Muslim respondents go for less antenatal visit than women of other religion, which is alarming. Discrimination between male child and female child has significant effect here as for male child, women go for more antenatal visit, whereas for female child it is exactly opposite. But women who goes for more antenatal visit, takes more antenatal care has lower odds having low birth weight child. Respondent's age shows who are above 18 years old takes more antenatal visits than who are below 18 years old. Though people think working mother's child don't get better care, in this study we've got women who are working, they go for more antenatal visit than who are not working. Education plays Significant role in antenatal care. If husband and women both are highly educated, then those women go for more antenatal visit, but when respondent's husband and respondent, both have primary education, they don't go for more antenatal visit, means, in that care respondent don't get better antenatal care. In conclusion, it can be said, both in rural and urban areas there are some factors having association with respondent's antenatal visit and getting better antenatal care.

Recommendations

- For future analysis, it is recommended to study with primary data to see more accurate result
- Further analysis can be done to see if child's birth order has association with getting antenatal care
- Respondent's husband's economic status and his birth order in the family can also be a good analysis to check association with respondent's antenatal visit

- For further study, association between antenatal care and autism can also be checked.

- If doctor's gender preference has any association with antenatal care, can also be a good topic for further study

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