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Research Article

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Socio-demographic determinants influencing antenatal care seeking behaviour among women in Bangladesh: an application of factor analysis

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ABSTRACT

Background: Pregnancy-related complications are one of the leading causes of death among women in the reproductive ages in developing countries. Antenatal care is an essential component for reducing maternal and infant morbidity and mortality. The study had been made an attempt to investigate the socio-demographic determinants of antenatal care seeking behavior among women in Bangladesh.

Methods: Present study used secondary data from Bangladesh Demographic and Health Survey (BDHS-2011) with married women aged between 15-49 years. Results were obtained by adopting data reduction procedure and multinomial logistic regression model.

Results: Factor analysis procedure had been used to determine two factors: (F1) "current status of age & reproductive experience" - consisted of the variables respondent's age, partner's age, marital duration, and number of living children; and (F2) "initial status of marital age & birth" - consisted of the variables age at marriage and age at 1st birth. These two factors were used in the subsequent analysis instead of the six demographic variables. The logistic regression analysis indicated region, type of place of residence, education, wealth index, Mass media exposure and two extracted factors had significant influence on antenatal care seeking behavior in Bangladesh.

Conclusions: This study suggests that cultural issues, demographic and socioeconomic status are important determinants of Antenatal care seeking behaviour. Appropriate programs for strengthening female education and women empowerment should be to improve the health of mothers and children in the country.

Keywords: Maternal health services, ANC seeking behaviour, Data reduction, Factor, Demography, Multivariate Technique and Public health

INTRODUCTION

According to the World Health Organization report, women of childbearing age (aged between 15-49 years) constitute more than one-fifth of the world's population and are repeatedly exposed to the risk of pregnancy and childbearing.¹ Every year half a million women face

untimely death due to complications during pregnancy, childbirth or after six weeks following delivery. It has also been reported that 99% of these deaths occur in developing countries. To prevent undesirable events during pregnancy, antenatal care (ANC) is considered to be the most essential component of maternal and child health services to identify pregnancy related problems in

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the early period.² As per WHO recommendation, every pregnant woman should receive at least four ANC visits during her pregnancy. These services can be taken either by visiting a health centre where such services are available or from health workers during their domiciliary visits.³ Though Bangladesh has made a significant improvement towards achieving the Millennium Development Goal (MDG) target no. 5 on improving maternal health, pregnancy related complications remains the leading cause of death and disability among women who are in reproducible age. Therefore, the present study mainly focuses on the socio-demographic determinants on ANC seeking behaviour among Bangladeshi women considering the fact of reducing multi collinearity problem among variables. There are two part of the current study- at first factor analysis will be carried out for obtaining important factors of ANC seeking behaviour followed by multinomial regression analysis to verify the resulted factors and some other significant socio-demographic variables.

METHODS

This study utilizes secondary data of 4565 ever-married women in the age group 15-49 and whose husband is only considered as the household-head, extracted from Bangladesh Demographic and Health Survey (BDHS-2011) conducted by the authority of the National Institute for Population, Research and Training (NIPORT) of the Ministry of Health and Welfare, Bangladesh and funded by USAID.⁴

The determinants of antenatal care seeking behaviour are identified by using multinomial logistic regression model. In order to reduce the multicollinearity problem, factor analysis used to identify some significant factors of antenatal care seeking behaviour, based on principal components analysis. Principal component analysis (PCA) is used for extraction of factors and orthogonal rotation (varimax option) to derive non-correlated factors.

This varimax method attempts to diminish the number of indicators that have high loading on single factor. For choosing the number of factors in factor analysis, Kaiser Criterion is used. Eigen plot (scree plot) also shows the total variance associated with each other. Thus, the study investigates the socio-demographic determinants of antenatal care seeking behaviour in Bangladesh adopting factor analysis and multinomial logistic regression model.

RESULTS

Basic characteristics

The mean age of the respondents was 26.82 years and 66.6% women live in rural areas. Most (90.1%) of the respondents were Muslims. Twenty-seven percent of the respondents were from the poorest socio-economic class, 18% were from the middle class, and 18% were from the richest class. About 23% percent of women had no education and only 11.7 percent were employed. In the case of antenatal visit during pregnancy, only 24.2% respondents had at least 4 times ANC visit during pregnancy time and about 37% of the respondents never had any ANC visit; 45.6% of them are from rural areas.

Factor analysis

Respondent's age, partner's age, number of living children, respondent's age at marriage, age of respondent at 1st birth and marital duration are selected for factor analysis. The factors are extracted by principal component analysis with varimax rotation method. On the basis of the value of the eigen value and percentage of variation, Table 1 leads that first two components accounted for 83% of the total variation and rest (for eigen value <1) explain only 17% of the total variation. Therefore, the first two factors are retained; the other factors are not included in the model. Here the adequacy of data is evaluated based on the value of KMO and homogeneity of variance (Table 1).

Table 1: Total variance explained by the obtained factors of ANC seeking behaviour.

Componen	Initial eigen values			Rotation sums of squared loadings			
t	Eigen values	Percentage of	Cumulative	Eigen values	Percentage of	Cumulative	
		variance	percentage		variance	percentage	
1	3.235	53.925	53.925	3.225	53.745	53.742	
2	1.78	29.668	83.593	1.791	29.848	83.593	
3	0.434	7.238	90.831				
4	0.335	5.582	96.413				
5	0.194	3.240	99.654				
6	0.021	0.346	100.000				

Extraction method: principal component analysis.

Figure 1 presents the scree plot showing Eigen values of each component for ANC seeking behaviour of

Bangladeshi women where two components extracted by Factor Analysis (BDHS-2011) (Figure 1).

Rotated component matrix for ANC seeking behaviour of women in Bangladesh indicating factor loadings and communalities is presented in the Table 2. Factor analysis obtained total 6 components, from which only 2 components are significant according to Kaiser Criterion (Table 2).

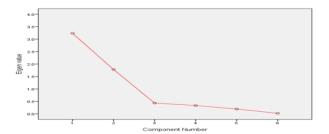


Figure 1: Scree plot for factor analysis.

Table 2: Rotated component matrix with factor loadings and communality values.

Variables	Fa	ctor	Communalities
variables	F_1	F_2	Communanties
Respondent's age	0.933	0.271	0.943
Partner's age	0.848	0.159	0.745
Number of living children	0.855	-0.207	0.773
Age at marriage	-0.024	0.893	0.798
Age at 1st birth	0.056	0.915	0.841
Marital duration	0.949	-0.122	0.916

The factor loadings in the component matrix in Table 2 are the correlations of the variables with the factors. About 94, 75, 77 and 91 percent variation of respondent's age, partner's age, number of living children and marital duration respectively are explained by factor F_1 . Again factor F_2 explains 79 and 84 percent variation of age at marriage and age at first birth respectively. Therefore the variables respondent's age, partner's age, marital duration, and number of living children are related strongly to factor F_1 and thus instead of using four variables, F_1 (current status of age & reproductive experience) used as manifest variable. Similarly factor F_2 (initial status of marital age & birth) also extracted instead of variables age at $1^{\rm st}$ birth and age at marriage.

Determinants of antenatal care seeking behaviour in Bangladeshi women: using multinomial logistic regression model

Multinomial logistic regression analysis was conducted taking into consideration "ANC receive" as a dependent variable. For the convenience of present study, this dependent variable was treated as a trichotomous variable indicating- a) "Adequate care: who received at least four ANC visit during pregnancy time"; b) "Inadequate care: who received less than 4 ANC visit" and c) "No care: who didn't receive any ANC visit during pregnancy time".

Using factor analysis two factors extracted and the factor scores were used in logistic regression analysis instead of six demographic variables. Factor scores were divided into categories making the sense that lower the value of the factors the lower the value of the variables. Respondent's mean age were found 22.72, 31.08, and 40.69 years when factor F_1 categorized as -1.79 to 0, 0 to 2, and 2 to 4.17 respectively. Similarly mean values for number of living children were 1.63, 3.34 and 5.80 respectively under F_1 . Again the mean age at marriage and mean age at 1^{st} birth were about 15.38 years and 17.5 years respectively when factor F_2 take the value -1.46 to 2.16 and mean value of these two variables were 23.28 years and 27.63 years respectively when factor F_2 takes value 2.16 to 5.79.

Table 3 shows the estimated regression coefficients along with the odds ratio from the logistic regression model of antenatal care seeking behaviour (Table 3).

The analysis in Table 3 showed that Place of residence played an important role to determine the ANC seeking behaviour in Bangladesh. Compare to rural areas, the likelihood of receiving ANC was significantly higher in urban areas. Women residing in urban area received 1.44 times and 2.90 times more inadequate and adequate ANC respectively than their counterpart rural area. So the rural people are lower ANC seeker than urban women which is associated as level of consciousness about ANC.⁵

The model indicated significant variation that different region of the country had different level of antenatal care seeking behaviour, may be because of the difference of culture, taste, religious faith and socio-economic condition. Women from Barisal, Khulna, Rajshahi and Rangpur division received inadequate and adequate ANC more than Dhaka division. On the other hand, Chittagong and Sylhet division had the worst performance in ANC seeking behaviour in comparison with Dhaka division. In Sylhet division women were 19% and 31% less likely to receive inadequate and adequate ANC respectively than Dhaka division. The likelihood of adequate ANC seeking behaviour was 0.70 times less in Chittagong division comparing with Dhaka division. Lack of knowledge on maternal health, respondent's lower education, poor access to work outside may be the reasons which lead these divisions as a lowest performer in receiving ANC.

Women's education appeared as another important predictor of ANC seeking behaviour. Women with no education, primary and secondary education had received adequate ANC 0.03, 0.06 and 0.14 times less than women with higher education. So women with primary education were 94 percent less likely to receive adequate ANC than highly educated women. The corresponding figures for inadequate ANC were 0.14, 0.23 and 0.36. This finding supported that literacy of women had a significant association with the use of ANC services.⁶

Wealth index showed significant positive effect on receiving both inadequate and adequate ANC. Poor women were 57% and 74% less likely to receive inadequate and adequate ANC respectively than rich.

Similarly women from middle class received 0.55 times and 0.40 times less inadequate and adequate ANC respectively than richest respondents.

Table 3: Determinants of ANC seeking behaviour by multinomial logistic model.

Covariates	Inadequate care (RC=No care)		Adequate care (RC=No care)					
Covariates	Coefficient (β)	Odds ratio (OR)	Coefficient (β) -1.93****	Odds ratio (OR)				
Intercept	-0.46	-	-1.93***	-				
Place of residence								
Urban	0.37	1.44***	1.06	2.90***				
Rural (R)	-	-	-	1.00				
Region								
Barisal	0.03	1.03	0.46	1.59***				
Chittagong	-0.29	0.75**	-0.35	0.70^{**}				
Sylhet	-0.21	0.81*	-0.37	0.69**				
Khulna	0.25	1.29	0.41	1.51**				
Rajshahi	0.61	1.84***	0.57	1.76***				
Rangpur	0.68	1.98***	1.41	4.11***				
Dhaka (RC)	-	-	-	1.00				
Respondent's Education								
No education	-1.94	0.14***	-3.42	0.03***				
Primary	-1.45	0.23***	-2.78	0.06***				
Secondary	-1.02	0.36***	-1.95	0.14***				
Higher ^(RČ)	-	-	-	1.00				
Wealth index								
Poor	-0.83	0.43***	-1.36	0.26***				
Middle	-0.59	0.55***	-0.90	0.40***				
Rich (RC)	-	-	-	1.00				
Current status of age & reproductive experience (F ₁)								
-1.79 to 0	0.40	1.49**	1.53	4.63***				
0 to 2	0.22	1.25	1.18	3.26***				
2 to 4.17	-	-	-	1.00				
Initial status of marital age & birth (F ₂)								
-1.46 to 2.16	-0.10	0.90	-1.04	0.35***				
2.16 to 5.79	-	-	-	1.00				
Mass media exposure								
Yes	0.28	1.33***	0.38	1.47***				
No	-	-	-	1.00				

RC: Reference Category; Significance level: ***: p<0.01, **: p<0.05 and *: p<0.1

Factor F_1 and F_2 both had significant effects on ANC seeking behaviour. For factor F_1 , women with factor score -1.79 to 0 were 1.49 times more likely to receive inadequate ANC than the reference category. That is women whose mean age, partner's age and number of living children were 22.72 years, 30.81 years and 2 respectively are 1.49 times more likely to receive inadequate ANC than those women whose mean age, partner's age and number of living children were 40.69 years, 51.8 years and 6 respectively. On the other hand, women were 4.63 times and 3.26 times more likely to

receive adequate ANC for factor score -1.79 to 0 and 0 to 2 respectively.

Similarly for factor F_2 women with factor score -1.46 to 2.16 had 65 percent decreased odds of receiving adequate ANC compared to the reference category scored 2.16 to 5.79.

Finally the relation between mass media exposure to the ANC seeking behaviour was found to be statistically significant. The women who were exposed to mass media had 47 percent more likely to receive adequate ANC than

women with no exposure. The corresponding figure for inadequate ANC was 1.33.

DISCUSSION

Extensive researches have been carried out in developing countries to understand the accurate scenario and importance of antenatal care seeking behaviour. A crosssectional descriptive study had been done in Nepal on the antenatal care services among women of reproductive age found that family income, ethnicity, age, maternal education, occupation of both parents, type of family were strongly associated with the use of ANC services. These Results were obtained by the frequency distribution and cross-tabulation of the variables. Significant difference was also observed between the religion and attendance of ANC services.⁷ Another study in Tangail district of Bangladesh revealed that educated mothers had the highest percentage of adequate ANC use compared to those who had no education. Binary logistic regression used to identify the underlying influential factors. It was also revealed in the study that access to mass media had a significant association with the use of ANC services. Other factors such as age, total number of living children, wealth index and mode of transport were important that positively correlates the use of ANC during pregnancy of the postnatal.3 Along with socioeconomic disparities, cost concern for medical treatment founded as principal reason for failing to seek care for life-threatening complications during pregnancy among Bangladeshi women.⁸ Women reported low using of antenatal care as well as low rates of delivery with the assistance of a skilled provider and women who didn't seek effective treatment were those with the most severe life-threatening complications. Critical roles were played by declining levels of fertility, unwanted pregnancy and improved obstetric care in order to address maternal health care needs of Bangladeshi women. A study of the Mru Community in Bangladesh had been introduced by using multivariate technique for determining the factors associated with antenatal and postnatal care. This study revealed that the main reasons behind lack of ANC and PNC were distance to the service centres and transportation problems. Respondent's place of residence, age, level of education and exposure to any mass media were also associated with antenatal care. A recent study presented the socio-economic factors associated with antenatal care seeking behaviour using the data of BDHS-2007. Five factors named consciousness factor, age and reproductive experience factor, autonomy factor, mother's involvement with labour force participation factor and regional difference factor were extracted from 14 variables by factor analysis, considered as underlying reasons behind ANC seeking behaviour. Linear discriminant analysis was done to verify the extracted factors identified in the study. 10

The analysis of present study showed almost similar behaviour among Bangladeshi women. Region, type of place of residence, education, wealth index and Mass media exposure had significant influence on antenatal care seeking behaviour. Since the data came from BDHS, carried out in 2011, seven divisions were specified in region variable; Mymensingh was not considered separate division in this study since it was declared as new division on 12 January 2015.

CONCLUSION

In spite of everything, more than half of the women are still unaware of the benefits or consequences of antenatal care visits. The findings of the study suggest that higher education, urban residence and access to mass media have significant impacts on ANC seeking behaviour of women. Primary and secondary education is open for all women by Governmental facilities, but higher education is still limited due to lack of financial support. It is well known that urban residents get more opportunity to be educated and usually more affluent than rural residents. They also have enough time and scope to access to the mass media (TV, radio, newspaper etc.) which plays a great role to encourage them to receive proper antenatal care during pregnancy. It can be recommended that, female education must be strengthened to enhance antenatal health care behaviour of women. Moreover special focus is needed to target women, especially on those who are from lower wealth quintiles. For improving women empowerment appropriate steps also should be considered. Researchers and policymakers can use this study as a tool to understand the current scenario of ANC utilization of Bangladesh and for any possible intervention aimed at reducing maternal mortality as well as achieving the MDG target no. 5 on improving maternal health.

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Institutional Ethics Committee

REFERENCES

- 1. World Health Organization, 2010. Trends in maternal mortality: 1990-2008. Geneva: WHO.
- 2. Nuraini E, Parker E. Improving knowledge of ANC among pregnancy women in field trial in Central Java Indonesia. Asia Pac J Public Health. 2005;17(1):3-8.

- 3. Shahjahan. Factors associated with use of antenatal care services in a rural area of Bangladesh. South East Asia Journal of Public Health. 2012;2(2):61-66.
- National Institute of Population Research and Training, Mitra and Associates, Macro International. Bangladesh Demographic and Health Survey 2011. Dhaka, Bangladesh: NIPORT. 2011.
- 5. Rahman A. Effectiveness of an integrated approach to reduce perinatal mortality: recent experiences from Matlab, Bangladesh. BMC Publ Health. 2011;11(1):914.
- Erlindawati, Chompikul J, Isaranurug S. Factors related to the utilization of antenatal care services among pregnant women at health centers in Aceh Besar district, Nanggroe Aceh Darussalam province, Indonesia. J Public Health Dev. 2008;6:99-108.
- 7. Pandey S, Karki S. Socio-economic and Demographic Determinants of Antenatal Care

- Services Utilization in Central Nepal. International Journal of MCH and AIDS., 2014;2(2):212-9.
- 8. Koenig. Maternal Health and Care-Seeking Behavior in Bangladesh: Findings from a National Survey. International Family Planning Perspectives. 2007;33(2):75-82.
- 9. Islam MR, Odland JO. Determinants of antenatal and postnatal care visits among Indigenous people in Bangladesh: a study of the Mru Community. Rural and Remote Health. 2011;11:1672.
- 10. Karmaker SC, Rabbi AM. The Socio-economic Determinants of Antenatal Health Care Utilization in Bangladesh: Evidence from Multivariate Techniques. Dhaka Univ. J. Sci. 2015;63(1):19-23.
- 11. Demographic and Health Surveys (http://dhsprogram.com/).

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