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DETERMINANTS OF DELIVERY CARE IN A SELECTED RURAL AREA OF BANGLADESH

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Abstract: *The aim of the study was to identify the determinants of delivery care in a selected rural area of Bangladesh. A community-based cross-sectional study was conducted in Madhupur Upazila (sub-district) in Tangail district of Bangladesh. A total of 360 postnatal mothers who visited the Expanded Programme on Immunization (EPI) centre's were randomly selected to elicit information on various socio-demographic and practice on delivery care. Among the respondents about 76% were literate. Twenty-two percent of the respondents were from the poorest socioeconomic class. Ante natal care service was utilized by 62.5% respondents. Majority (80.3%) of the respondents delivered at home and most of them (66.4%) felt that home delivery was comfortable. A considerable percentage of deliveries (50.6%) were attended by traditional birth attendants. Mothers who had one living child had the highest percentage of hospital delivery compared to those who had two or more living children. Educational level, access to mass media (watching TV and listen to radio), wealth index, antenatal care use and number of ANC visit had a positive significant ($p<0.001$) effect on the place of delivery care. The results of binary logistic regression analyses showed that, education of the mothers ($p<0.05$), living children ($p<0.002$), mass media ($p<0.02$), wealth index ($p<0.05$), antenatal care use ($p<0.001$) and number of ANC visits ($p<0.001$) correlates with delivery care. In this study socio-demographic factors were associated with delivery care practice. The study suggested that the significant effect of delivery care, education of the mothers, living children, mass media, wealth index, antenatal care use and number of ANC visits are determinants of delivery care of rural women.*

Keywords: *Determinants; delivery care; rural area, Bangladesh*

Introduction

Safety of mother and new born even after the pregnancy period depends highly on delivery care and place of delivery during pregnancy. Insufficient care during delivery is largely responsible for maternal and infant deaths that occur just before or during delivery. Almost all maternal deaths occur in developing countries [1], where the majority of women deliver at home without skilled birth attendant. These mothers are at increased risk from unpredictable obstetric complications, often ending in death either at home or after transfer to a health facility [2,3]. Pregnancy and childbirth related complications are among the leading causes of maternal mortality in Bangladesh[4]. The health and family planning program of Bangladesh has made remarkable progress in the last two decades as

evident from the decline in rates of maternal mortality-the death of women during pregnancy, childbirth, or in the 42 days after delivery, but the maternal mortality ratio (MMR) remain very high (194 maternal deaths per 100,000 live births)[5].

The majority of maternal deaths and disabilities occur suddenly and unpredictably between the third trimester and the first week after the end of pregnancy due to hemorrhage, sepsis, and obstructed or prolonged labor[6]. Women and their families face socioeconomic and cultural barriers to seeking professional delivery care, such as high costs, long distances to health facilities, lack of knowledge about danger signs during pregnancy, and a tradition of using untrained local practitioners during delivery [7].

Maternal mortality is one of the most important health challenges the world is facing today. More than 20 million women experience ill health as a result of pregnancy each year. The risk of a woman dying as a result of complication related to pregnancy in developing countries can be as much as 100 times that of women in Western Europe or North America[8].

In Bangladesh, high maternal mortality and morbidity rates are underpinned by the fact that 85 per cent of women give birth at home, most with unskilled attendants or relatives assisting. Bangladesh Maternal Mortality and Health Care Survey 2010 reveal that almost 2.4 million births take place at home annually, especially in rural areas. However, only 27% of all births in Bangladesh are assisted by skilled professionals and only 23% of births take place in a health facility [5].

Though the safe mother hood initiative has been priority in recent years, maternal morbidity and mortality still remain a major public health issue in most developing countries including Bangladesh. Child birth is a time of transition and social celebration in many societies. Women's progression from birth to child bearing is influenced by economy, religion, kinship system and the complexity of communications and medical technology[9]. Women are most in need of skilled care during delivery and immediate postpartum period. Traditional birth attendants, whether trained or untrained can neither predict nor cope with serious complications. Thus, this study was designed to identify the determinants of delivery care in a selected rural area of Bangladesh.

Materials and Methods

Study Design and sample size : A community-based cross-sectional study, which was approved by the ethical review committee of the Bangladesh Medical Research Council (BMRC), was conducted in the MadhupurUpazila (a mid-level administrative unit) of Tangail district in Bangladesh between January and June 2012. This Upazila is located in 140 km from northwest of Dhaka with a population of 3,08,846[10]. Most of them (80 percent) live in rural area and economically dependent on agriculture. We collected information from the randomly selected postnatal mothers focusing on antenatal care (ANC) and utilization of delivery care of their recent deliveries. To draw our sample, first we prepared a sampling frame of postnatal mothers who visited different centers of the Expanded Program on Immunization (EPI) in the MadhupurUpazila. It should be noted that there are various EPI centers in this Upazila and each center maintains an EPI

register to record all postnatal mothers during their visits. Briefly, all the EPI registers of the Madhupurupazila constituted the sampling frame. The sample size was then determined based on the information (particularly using the prevalence of postnatal mothers who visited healthcare facilities for PNC) of the Bangladesh Demographic and Health (BDHS) 2007. According to this report, about 30% of the postnatal mothers visited healthcare facilities for PNC services. After adjusting a non-response rate of 10%, the sample size became 360. From the sampling frame, we then randomly selected the required number of postnatal mothers for interviews.

A pre-tested structured questionnaire was used to collect information with special focus on maternal socio-economic factors and practices on delivery care. Only some of these factors are analyzed in this study, which are grouped (with categories in parentheses) as follows:

Maternal socio-economic factors: Maternal age (< 20, 21-25, 26-30, 30+ years), age at marriage (< 20, 21-25, 25+ years), maternal education in years (0/no formal education, 1-5/primary, 6-10/ secondary, 11-12/higher secondary+), maternal occupation (housewife, service/agriculture/else), total number of living children (1, 2-3, 4+), reading newspapers (yes, no), listening to radio (yes, no), watching TV (yes, no), having mobile phone (yes, no), 2.2.2 ANC and delivery factors: Receiving antenatal care (yes, no), number of ANC visit (0, 1, 2-3, 4+), place of delivery (home, hospital), decision maker in family (husband, mother/father in law, others), conduction of delivery (trained birth attendant, traditional birth attendant, neighbor/relatives), reason for home delivery (comfortable, family decision, financial problem, hospital is far, other).

Delivery care: Delivery care was defined as a care that has taken place during delivery at health center or a hospital or in home facilitated by skilled birth attendants.

Place of Delivery: Place of delivery means where delivery of a baby takes place. In this study place of delivery was the main dependent variable while characteristics that determine the place of delivery service namely age, education, occupation, total number of living children, access to mass media (reading newspapers, watching TV and listening to radio), wealth index, receiving antenatal care and number of ANC visit were the independent variables.

Statistical analyses: Data were analyzed using the SPSS software for Windows (version 17). Analysis of data on postnatal mother was done taking into consideration socioeconomic status and delivery care. Descriptive summary statistics, such as mean and standard deviation (SD), were computed for continuous variables and proportions for categorical characteristics of the mothers. The significance of the differences in patterns among values of the associated factors was tested using chi-square test at a 5% level of significance. Odds ratios with 95% confidence interval (CI) were calculated using the logistic regression model to control confounders and identify the factors associated with the practice of delivery care.

Results

Out of 360 respondents, 145(40.3%) were between 21-25 years of age with mean age 24 (SD=±4.4) years. Most (95.6%) women were housewives and 272(75.5%) were literate. Regarding age of the marriage, highest percentage of the respondent's (81.9%) was up to 20 years. Twenty-two percent of the respondents were from the poorest socioeconomic class, 20% were from the middle class, and 19% were from the richest class. In the case of accessibility to mass media, 83% had never read newspapers, 90% had never listened to radio, 40% had never watched television (TV), and 54.4% had no mobile phones (Table 1).

Among the respondents 62.5% took ante natal care, among them only 14.4% women had received ANC services at a health facility at least once during their last pregnancy. Majority (80.3%) of the delivery take place at home and 66.4% respondents felt it comfortable to deliver at home. In most cases (47.2%) decision were taken by husband. Half (50.6%) of the deliveries were conducted by traditional birth attendants (Table 2).

Regarding bivariate analyses, the socio-demographic characteristics, such as education of the respondent's ($p<0.001$), wealth index ($p<0.053$), total number of living children ($p<0.002$), watching TV ($p<0.026$) and listen to radio ($p<0.05$) were positively associated with place of delivery. On the other hand, significant associations were shown between place of delivery and utilization of antenatal care along with number of ANC visit ($p<0.001$) (Table 3).

Binary logistic regression analysis was conducted taking into consideration place of delivery as a dependent variable. The model suggested that education ($p<0.05$), living children ($p<0.001$), reading newspaper ($p<0.035$), watching TV (0.028), utilization of antenatal care ($p<0.001$) and number of ANC visit ($p<0.001$) were the important correlates of delivery care of the postnatal mothers (Table 4).

Table 1: Socio-demographic characteristics of respondents (n=360)

Variable	Number	Percentage
Age-group (years)		
Up to 20	105	29.2
21 – 25	145	40.3
26 – 30	89	24.7
>30	21	5.8
Mean± SD	**24 ±4.4**	
Occupation of mother		
Housewife	344	95.6
Farming	2	.6
Service	10	2.8
Others	4	1.1
Number of total living children		
1	151	41.9

2-3	184	51.1
4+	25	6.9
Mean± SD	**1.9±1.1**	
Age at marriage		
Up to 20	295	81.9
21 – 25	24	6.7
>25	40	11.1
Education of mother		
No formal education	88	24.5
Primary	122	33.9
Secondary	138	38.3
Higher secondary	12	3.3
Wealth index		
Poorest	80	22
Poor	64	18
Middle	72	20
Rich	75	21
Richest	69	19
Access to mass media		
Reading newspaper		
Yes	63	17.5
No	297	82.5
Listening to radio		
Yes	35	10
No	325	90
Television watching		
Yes	217	60
Never	143	40
Having mobile phone		
Yes	164	45.6
No	196	54.4

Table 2: ANC and delivery care of respondents (n=360)

Variable	Number	Percentage
Receiving antenatal care		
Yes	225	62.5
No	135	37.5
No. of ANC visit		
0	135	37.5
1	52	14.4
2-3	122	33.9
4+	51	14.2
Place of delivery		
Home	289	80.3

Hospital	71	19.7
Decision maker in family		
Husband	170	47.2
Mother/Father in law	154	42.8
Other family members	36	10.0
Conduction of delivery		
Trained birth attendant	72	20.0
Traditional birth attendant	182	50.6
Neighbor/Relatives	106	29.4
Reason for home delivery		
Comfortable	239	66.4
Family decision	21	5.8
Financial problem	45	12.5
Hospital is far	12	3.3
Other	43	11.9

Table 3: Association between place of delivery and other related demographic variables

Variable	Home	Hospital	p value
Age			
Up to 20	105	29.2	0.200
21 – 25	145	40.3	
26 – 30	89	24.7	
>30	21	5.8	
Education			
No formal education	78	10	**0.001**
Primary	107	15	
Secondary	100	38	
Higher secondary	4	8	
Living children			
1	109	42	**0.002**
2-3	95	20	
4+	85	9	
Read newspapers			
Yes	39	24	**0.001**
No	250	47	
Listen to radio			
Yes	26	9	0.348
No	263	62	
Watching TV			
Yes	166	51	**0.026**
No	123	20	

Wealth index			
Poorest	69	11	**0.053**
Lowest	53	11	
Middle	60	12	
Upper middle	60	15	
Richest	47	22	
Utilization of antenatal care			
Yes	165	70	**0.001**
No	124	11	
No. of ANC visit			
0	124	11	**0.001**
1-3	133	41	
4+	32	19	

The χ^2-test was conducted. The level of significance at $p<0.05$

Table 4:Binary Logistic regression analysis considering place of delivery as dependent variables

Independent variable	β	p value	OR
Age	0.051	0.277	1.052
Education			
No formal education	Reference		
Primary	0.089	0.837	1.093
Secondary	1.087	0.005	2.964
Higher secondary	2.747	0.001	15.600
Living children			
1	Reference		
2-3	0.764	0.005	0.466
4+	2.224	0.032	0.108
Wealth index			
Poorest	Reference		
Poor	0.089	0.837	0.435
Middle	1.087	0.005	0.621
Upper middle	2.747	0.001	0.448
Richest	1.077	0.009	1.936
Read newspapers			
No	Reference		
Yes	0.759	0.035	2.137
Watch TV			
No	Reference		

Yes	0.636	0.028	1.228
Receiving antenatal care			
No	Reference		
Yes	1.411	0.001	0.244
No. of ANC visit			
0	Reference		
1-3	1.246	0.001	3.475
4+	1.901	0.001	6.693
Constant	-0.246	0.825	0.759

The level of significance at $p<0.05$

Discussion

The majority of the literature on the delivery care in low-income countries focuses on the barriers encountered by women[11]. However, the role of the family, socio-cultural factors primarily influence decision-making on whether to seek care, rather than affecting whether women reach a facility.

This study was designed to identify the determinants of delivery care in a selected rural area of Bangladesh. The study revealed that literacy rate of the respondents was about 75.5% of whom 122(33.9%) had primary level of education. This is much higher than that of previous national literacy rate of female which was 48.8% [12].

The findings of this study showed that among the respondents 62.5% took ANC during pregnancy which is quite similar (89.9%) with previous study done in Dhamraiupazila in Dhaka district of Bangladesh. [13]. Utilization of antenatal care services by a considerable proportion of respondents with only 14.4% of women attained at least once antenatal care visits during their last pregnancy. This finding is almost similar to the percentage (16.4%) reported by the Bangladesh Demographic Health Survey[14]. Regarding the place of delivery it was evident that the practice of home deliveries was higher than that of hospital deliveries. In a similar study conducted among the urban women of Nepal showed that planned home deliveries were 58.3%, which was much less than present study[15]. Majority of the respondents (66.4%) felt that home delivery was comfortable. In a similar study conducted among the urban women of Nepal shows that 25.7% home delivery was conducted due to comfort[16]. The result of the study showed that a considerable percentage of deliveries (50.6%) were attended by traditional birth attendants. Trained birth attendant was involved only in 20.0% cases which is almost same (30.1%) as revealed by another study conducted in a union of Mirsarai, Chittagong[17]. Prominent role in decision making was of husband in 47.2%. Similarly, in another study, husband's advice was the dominant feature for home or institutional delivery of 48.8% respondents[18].

Maternal education is strongly associated with delivery care. It is obviously that higher educated mother are more conscious than illiterate mother and they are more likely to receive delivery care services during delivery. In binary logistic analyses mother's education appeared as important predictor to determine practice of delivery care

($p<0.05$). Mothers with primary education and secondary education had received hospital facilities as delivery care 0.39 and 0.67 times more than mothers having no education. Many previous studies conducted in developing countries have found education of mothers to be among the most important determinants of skilled delivery care utilization[19,20]. There are a number of explanations that speculate as to why education is a key determinant of skilled delivery care demand. For example education is likely to enhance female autonomy so that mothers develop greater confidence and capabilities to make decision regarding their own health, as well as their children. It is also more likely that educated women demand higher quality service and pay more attention to their health in order to insure better health for themselves. Moreover, educated women are more likely to be aware of difficulties during pregnancy and as a result, they are more likely to use maternal health care services [19]. Our study showed significant association between numbers of children with place of delivery. Similar results were seen in a study from Nigeria where more women of high parity delivered at home ($p<0.05$)[21]. In a Bangladeshi study found that TV sets and wealth index appears positive effect on receiving delivery care[22]. Our study also showed similar findings.

In this study utilization of antenatal care and number of ANC visit showed positive association with delivery care. Another study was found that mother who received adequate antenatal care is 3.67 times more likely to receive satisfactory delivery care than who didn't receive any antenatal care[22].

Conclusion

The results of this study revealed that education of the mothers, living children, mass media and member of a NGO are the important determinants of delivery care during pregnancy. Thus the results of the study suggest that antenatal care advice can contribute to increase is needed practice of delivery care. Health education program strengthen to improve maternal health in rural area of Bangladesh.

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