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Relationship Between Educational Attainment and Maternal Health Care Utilization in Bangladesh: Evidence from the 2005 Bangladesh Household Income and Expenditure Survey

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Abstract: The Millennium Development Goals (MDGs) calls for a 75% reduction in maternal mortality between 1990 and 2015. Trained Birth Attendance and Antenatal Care are two of the most important interventions to reduce maternal mortality. Identifying the factor associated with maternal health care utilization would have meaningful implications in a generalized highly maternal mortality country in Bangladesh. The study is based on secondary data of the household income and expenditure survey conducted by Bangladesh Bureau of Statistics during 2005. The sample included only 8836 women, who have maternal health history in their last child birth. Of the 8836 women, 56.0 and 16.4% received antenatal care and trained delivery assistance, respectively. Logistic regression results indicate that educational attainment is the significant predictor that affects the maternal health care utilization. Regarding the use of ANC, women with education were substantially more likely to use ANC than women without education (PC OR = 1.688, 95% CI = 1.476-1.940; SC OR = 2.897, 95% CI = 2.342-3.652; Bachelor and OR = 8.173, 95% CI = 4.724-15.284). In case of TDA, women with education were substantially more likely to use trained delivery assistance than women without education (PC OR = 1.938, 95% CI = 1.555-2.415; SC OR = 4.148, 95% CI = 3.194-5.387; Bachelor and OR = 9.240, 95% CI = 6.068-14.072). Maternal Health care utilization program components could include media campaigns, educational improvement as well as promoting policies that shape the women livelihoods and implementing maternal health care delivery services especially to make progress towards the MDGs five target in Bangladesh.

Key words: Maternal health service utilization, antenatal care, birth delivery assistance, child birth, Bangladesh

INTRODUCTION

There is a general consensus that the use of maternal health services reduces maternal and child mortality and improves the reproductive health of women. Maternal death is an important public health problem not only because of the large number of women die but also because of a traumatic effect of such an event on the child, the family and the community as a whole. The World Health Organization (WHO) estimates that 585,000 women of reproductive age die each year from complications arising from pregnancy. And a high proportion of these deaths occur in developing countries, where pregnancy and child birth are the leading causes of death, disease and disability among women of the reproductive age. One quarter of all adult women living in the developing world today suffer from some kind of illness or injury related to pregnancy and childbirth. The social and economic cost of these disabilities and deaths to families, communities, the labor force and countries is enormous (Mooti-Kaguna and Nuwaha, 2000). Utilization of maternal health care services has been identified as an important factor for child and maternal mortality. Less than half of the women in developing countries get adequate health care during and soon after child birth, despite the fact that most maternal death take place during these periods (Abou Zahr, 1997). A study of 718 maternal deaths in Egypt found that 92% of them could have been avoided if good quality care had been provided (Kassas, 1995).

According to statistics from the State of the World's Children, 2006, BDHS and MICS, Bangladesh has a high maternal mortality ratio with 320 deaths per 100,000 births. These high mortality rates are underpinned by the fact that nine out of 10 deliveries take place at home and mostly with unskilled attendants or relative assisting. This

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reflects the poor access to health care facilities during the pregnancy as well as the time of delivery. In Bangladesh, about 28,000 maternal deaths occur each year (Maine, 1993). The current mortality ratio in Bangladesh is estimated to be 4.5 per 1000 live births, which is still very high even by the standards of other developing countries (Mitra *et al*., 1997). Efforts to address, these issues have recently gained considerable momentum with formulation of the National Strategy for maternal health as improvement of maternal health is a key Millennium Development Goal and reducing maternal mortality is international priority. The considerable variation in maternal and child health in the developing country is believed to be partly due to differences in the availability and access to health services although, the government's serious commitment to deliver the health facility to the doorsteps of common people through innovative approaches such as Essential Service Package (ESP) which comprises Reproductive Health Care, Child Health, Immunization, Communicable Disease Control, Limited Curative Care and Behavioral Change Communication (BCC). Since the mid 1980s several studies have carried out to identify and understand why maternal health care services are underutilized in developing countries (Maine, 1993; Becker *et al*., 1993; Bhatia and Celand, 1995; Dharmalingam *et al*., 1999; Goldman and Pebley, 1994; Elo, 1992; Magadi *et al*., 2000).

Previous studies on determinants of maternal health care utilization in Bangladesh were either focused on rural based or regional based or other data sources as per available literature documented the fact. This research sought to attempt to fill these gaps by examining the factor that affect women's use of maternal health services in Bangladesh. Using data from the 2005, Household Income and Expenditure Survey, this study investigates the individual level factor especially educational attainment that influence women to use maternal healthcare services. The findings of the study provide insights for planning and implementing appropriate maternal health care delivery services especially to make progress towards the MDGs five target in Bangladesh.

Data source: Data used in this study come from the Household Income and Expenditure Survey (HIES-2005) conducted by the Bangladesh Bureau of Statistics under Planning Division, Ministry of Planning, Government of the Peoples Republic of Bangladesh. According to Bangladesh Bureau of Statistics (BBS), a two stage stratified random sampling technique was followed in drawing sample for HIES-2005 under the framework of Integrated Multipurpose Sample (IMPS). The sample for this study was those women, who had at least one birth in during the 3/5 years prior to the survey interview. For those, who had >1 birth, only utilization behavior associated with the most recent pregnancy was considered. The sample included only 8836 women, who have maternal health history in their last child birth. As per available data of the maternal health service utilization Antenatal Care (ANC) and Trained Delivery Assistance (TDA) treated as dependent variable and educational attainment treated as predictor variable. The data are accessible with permission from Bangladesh Bureau of Statistics, Ministry of Planning, Planning Division and Government of Bangladesh.

RESULTS

We used logistic regression to test the independent contribution of education factor for predicting maternal health care utilization behavior. Results were based on the underweighted sample for bivariate analysis. The characteristics of the study sample are presented Table 1. Of the total sample of 8836 women, who gave birth prior to the survey, 56.0 and 16.3% received antenatal care and trained delivery assistance, respectively for their last child from trained provider. The individual characteristic included in the study was maternal educational attainment was classified into four groups: Illiterate those who have no formal education and those, who completed ninth class are categorized as primary level education, those, who completed secondary and higher secondary school are known as secondary level, those, who completed bachelor and masters and professional degree holder such as doctorand engineer or equivalent degree are known to Bachelor/Masters and above level according to the country educational system.

Antenatal care use: The results of the antenatal care model are presented in Table 2. Of the individual level characteristics considered in the analysis, educational attainment of the woman has a positive, strong and significantly impact on the use of the antenatal care. The

Table 1: Descriptive statistics for dependent and independent variables

Variables	Total (N = 8836)	ANC (n_1 = 4944)	TDA (n_2 = 1449)
Educational attainment			
Illiterate	1600 (18.1%)	712 (1.5%)	1598 (1.8%)
Primary complete	3161 (35.8%)	2071 (41.9%)	3158 (35.8%)
Secondary complete	848 (9.6%)	679 (1.3%)	846 (9.5%)
Bachelor and above	173 (2.0%)	173 (0.7%)	173 (07%)

There are 13 respondents, who did not provide information regarding their age

Table 2: Logistic regression results on the determinant of Antenatal Care (ANC)

Variables	Odd ratio	Confidence interval
Educational attainment illiterate^R		
Primary complete	1.688**	1.476-1.940
Secondary complete	2.897**	2.342-3.652
Bachelor and above complete	8.173**	4.724-15.284

R-Reference category; **p<0.05 and **OR is significant at the 0.01 level (2 tailed)

Table 3: Logistic regression results on the determinant of trained delivery assistance

Variables	Odd ratio	Confidence interval
Educational attainment illiterate[R]		
Primary complete	1.938**	1.555-2.415
Secondary complete	4.148**	3.194-5.387
Bachelor and above complete	9.240**	6.068-14.072

R-Reference category; **p<0.05 and **OR is significant at the 0.01 level (2 tailed)

bivariate results show that children of mothers, who completed their secondary schooling are 2 times and who completed their Bachelor and above 8 times more likely to take antenatal care during their last pregnancies than children of mothers, who have no education. (PC OR = 1.688, 95% CI = 1.476-1.940; SC OR = 2.897, 95% CI = 2.342-3.652).

Trained birth delivery assistance: The results of trained delivery assistance model are presented in Table 3. Of the individual level characteristics, women with secondary complete and higher education attainment levels were 4 and 9 times, respectively more likely to take trained delivery assistance and found to be statistically significant in comparison to the women without completing school. TDA (PC OR = 1.938, 95% CI = 1.555-2.415; SC OR = 4.148, 95% CI = 3.194-5.387; Bachelor and above OR = 9.240, 95% CI = 6.068-14.072). Regarding the use of TDA, age ranging 25-34 and 35-49 years were significantly less likely than age ranging 15-24 and 25-34 years OR = 0.863, 95% CI = 0.722-1.031; 35-49 years OR = 0.447, 95% CI = 0.368-0.542).

DISCUSSION

One of the principal findings from this study was the proportion of receiving antenatal care, which is more than the trained delivery assistance. A possible explanation lies in the role played community level health workers posted in the rural areas, who provide antenatal care and health facility services to pregnant women by visiting their home. This Health Assistant (HA) and Family Welfare Assistant (FWA) is expected to visit every household at least once in two months. Same picture is revealed in the study conducted in Tamil Nadu and Karnataka, India indicated that 89 and 93% of women, respectively reported having been visited by a health worker in the last three months (Navaneetham and Dharmalingam, 2002). The study suggested that home visits by health worker could reduce the monetary and opportunity cost of pregnant women in the rural areas and thereby increasing the utilization of antenatal care, which reflect the real picture in Bangladesh rural areas (Arends-Kuenning, 1997).

The study is an initial attempt to analyze determinants in the use maternal health care utilization in Bangladesh, a country with low levels of and large socioeconomic differences in use of maternal health care services. Understanding these factors is of great importance, as presence of trained attendance at birth is relatively rare in Bangladesh, the reasons for most deliveries not being supervised by trained health workers include: insufficient numbers of trained health workers capable of supervising deliveries; unbalanced distribution of trained health workers, resulting into segments of the population having little access to maternity services. This picture suggests that the training of traditional birth attendant into safer delivery practice and equipping them into delivery kits should be given priority. One study in Bangladesh rural area documented that how social norms and rural identities are complex and dynamic, changing over time (Afsana and Rashid, 2001).

Another possible explanation could be that Bangladeshi women may be willing to seek care even if the initial delivery is conducted at home. Following on WHO recommendation a woman is deemed to have received adequate antenatal care if she receives at least four antenatal check ups. Unfortunately, the outcome variable of ANC is dichotomous nature of this study, which is clear limitation of the study as per WHO guidelines. However, it was not possible to analyze this sufficiency in this study due to unavailability of the HIES database. Interestingly, higher education was significantly and positively associated with receiving antenatal care and trained delivery assistance, echoing the need to improve the educational attainment of women (Abou Zahr, 1997; Becker *et al*., 1993; Bhatia and Celand, 1995; Dharmalingam *et al*., 1999; Elo, 1992; Navaneetha and Dharmalingam, 2002; Celik and Hotchkiss, 2000; Caldwell, 1981; Govindasamy and Ramesh, 1997; Obermeyer and Potter, 1991; Ragupathy, 1996; Ndyomugyenyi *et al*., 1998). Study regarding the Focus Group Discussion (FGD) also confirmed the maternal education is a real determinant of maternal health care utilization (Ragupathy, 1996). Maternal education increases women's perceived seriousness about maternal morbidities and enhances knowledge regarding the use of maternal health services. This is consistent with the research by Streatfield *et al*. (1990), who found that more educated women are more likely to be aware of the benefits of health care and as a result, are more likely to use preventive health care services (Streatfield *et al*., 1990).

A normal findings of the study is that socio-economic factors especially those households have pure source of drinking water, modern toilet facility and

modern communication facility such as telephone connection have positive and significant effect of the utilization of maternal health, antenatal care and trained delivery assistance and pronounced the disparities were found for maternal health care-seeking behavior in both urban and rural Bangladesh (Koenig *et al*., 2007), which ultimately confirms the findings.

The factors influencing the delivery site were: access to maternity services, social in fluencies from the spouse, other relatives, traditional birth attendant and health workers; self efficacy; habit (previous experiences) and the concept of normal versus abnormal pregnancy, which were well understood and articulated in Uganda (Mooti-Kaguna and Nuwaha, 2000). However, the study has several limitations. First, the study used a cross-sectional design; thus it is impossible to establish causality. A study using longitudinal design is necessary to assess the significance and stability of predictors of utilization behaviour over time. Second, the study is based on a secondary with archival data, which likely to reflects the perspectives and purposes of the original investigators. This is real challenge to shape the data to match the research questions, which required an intensive process of understanding the data set, recoding variables, recasting research variables/questions to match data available. Other limitations include self-reported information, which increases the possibility of inaccuracies, particularly with regard to information about maternal health utilization behaviour. In spite of these limitations the findings of the study are important.

CONCLUSION

Maternal health care utilization behavior is influenced by a number of interlinking forces that include individual and familial influences as well as more other forces such as health services availability and access. The findings demonstrate that maternal education plays a dominant role in accelerating the use of maternal health care in Bangladesh. Maternal health care utilization program components could include media campaigns, educational improvement as well as promoting policies that shape the women livelihoods and implementing maternal health care delivery services especially to make progress towards the MDGs five target in Bangladesh.

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