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## Determinants of Maternal Care Utilization in a Rural Area of Bangladesh: A Case Study of Udaypur Village of Bagerhat District

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**Keywords:** *bangladesh, bagerhat, rural area, maternal care utilization, health care services.*

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# Determinants of Maternal Care Utilization in a Rural Area of Bangladesh: A Case Study of Udaypur Village of Bagerhat District

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**Abstract-** The aim of the study was to identify the demand side factors that determine the decision to utilize maternal care from medically qualified providers in the rural village of Bangladesh. Different scholarly articles have divided the problem of health services into two categories of factors: demand side factors and supply side factors. In this study, we are considering only the demand side factors only because the supply has increased substantially over time. The study was conducted in Udaypur Aruakandi village of Bagerhat district where the government health care facility (UHC) is only 1 km away. Econometric methods are used to identify demand side determinants of health service utilization in general. Data from 60 selected women who has given birth within 2.5 years or were pregnant at the time of data collection from three strata of households from a purposively chosen village of Bangladesh were collected in the period 25 December, 2015 to 5 January, 2016. This study used both qualitative and quantitative analyses to identify the factors that affect the use of maternal health care. In the study area out of the 60 women, 53% received antenatal care from a medically trained provider, making 4 ANC visits is only by 30% women, 49% of the delivery were attended by SBAs, 35% of the women received post natal care from medically qualified providers. So the utilization of maternal care is very low. The result of logistic regression analysis show that in general the likelihood of using maternal care services is affected by the socio-economic conditions, family education, occupation and age of the respondent individually. The level of family education was found to be the main factor associated with use of the MCH services, besides, perception of quality about the services provided by nearest health care facilities, wantedness of pregnancy, women's decision making power are also the important determinants of maternal care utilization from medically qualified sources.

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## I. INTRODUCTION

The health status of women is an important indicator of the general health and well-being of the population of a country. Over the years, many impressive initiatives have been taken globally to improve maternal health status and reduce maternal mortality. Very recently different initiatives have been taken under goals specified in MDGs and SDGs. In the

United Nations Millennium Summit of 2000, improvement of maternal health was one of the Millennium Development Goals (MDGs). Finally, the declaration of Sustainable development goal 3 and target 1 is to reduce global MMR to less than 70 per 100,000 live births by 2030. Though the world has experienced considerable success in reducing maternal mortality, still about 830 women die from pregnancy- or childbirth-related complications around the world every day and the risk of a woman in a developing country dying from a maternal-related cause during her lifetime is about 33 times higher compared to a woman living in a developed country (WHO, 2015). The major determinants of maternal morbidity and mortality include pregnancy, the development of pregnancy-related complications, including complications from abortion, delivery, and the post delivery period. If the utilization of proper maternal care could be ensured, majority of the death would not occur.

Since the independence, Bangladesh has achieved remarkable progress in various health indicators including maternal health status[1] such as life expectancy at birth has increased, total fertility rate, under 5 mortality rate, maternal mortality have declined over time. Bangladesh was committed to the MDGs and developed different policies and strategies. As a result, the country has made significant progress in improving the maternal health status. Bangladesh has experienced a steady decline in maternal, neonatal, infant and under-five mortality in recent decades; however, the rate of decline is insufficient to achieve MDG 4 and 5 targets set for Bangladesh (UNICEF, 2013). Bangladesh is now preparing to welcome the post-2015 Sustainable Development Goals (SDGs) 2030. For the health sector in Bangladesh, the SDGs will create an opportunity for focusing on results through overcoming the challenges of the unfinished agenda of the MDGs (Health Bulletin, 2015). In 2000, maternal mortality ratio (MMR) was 399 deaths per 100,000 live births and by 2015, it has dramatically reduced to 176 deaths per 100,000 live births in Bangladesh (World Bank, 2015). But the condition is not yet at satisfactory stage, considerably compared to many other developing nations. Despite improvements, pregnancy-related complications remains the leading cause of death and disability among women of childbearing age [2]. To achieve the

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target specified in SDG, Bangladesh needs to go a long way. The maternal mortality rate in Bangladesh is mainly attributable to the low utilization of maternal health care services from qualified providers. Because there are demand-side barriers that inhibit women from seeking antenatal care (ANC), delivery, and postnatal care (PNC) services, including lack of information about when or from where to obtain treatment and women's awareness of potentially life-threatening conditions (NIPORT, 2005). Utilization of antenatal care received from a medically trained provider (at least one visit) is 64%, at least four visits is 31%; delivery care with skilled attendant at birth is 42%, although 22 percent of the births were delivered in a private facility, only 13 percent were delivered in a public facility, and 62 percent delivered at home; 36% receives postnatal care (BDHS, 2014). Further, inequity exists in the utilization of maternal care among the rural and urban areas of Bangladesh. So it is an important concern to bring those women who are not using the maternal care from qualified sources under the utilization.

## II. JUSTIFICATION OF THE STUDY

Evidence shows that the maternal mortality rate (MMR) are still at unacceptable level. So it is important to obtain information and identify reasons for low utilization of maternal health care services. In Bangladesh there are services for delivery care which may be insufficient amount, but they are not adequately used(2). Many investigations have been made to identify the underlying causes of low use of the MCH services provided through the public sector health care facilities. These mainly focused on both demand and supply side barriers. But over the time availability of maternal services at the rural level remarkably improved but the utilization has not increased remarkably. Thus, in Bangladesh, there is a research gap in this field due to inadequate research on the under-utilization issue from the perspective of users only. There are some research in this field but no research in this particular village of Bagerhat.

Against this background, it is therefore imperative that a study be conducted to analyze and describe the demand side factors that affect the utilization of maternal care by pregnant women. Therefore, the search for factors that influence utilization in that area will certainly be beneficial to improve the utilization of maternal care in rural areas of Bangladesh.

### a) Research Question

What are the demand side factors influencing utilization of maternal health care services in a rural area of Bangladesh?

*Research objective:* Using a rural village of Bangladesh as a case study, the objective of this study is to observe the utilization pattern and establish determinant factors in the utilization of maternal health care services from

qualified sources that is, the use of antenatal care services, skilled assistance during delivery, postnatal care among women of reproductive age in a rural area of Bangladesh.

### b) Specific objectives

- ❖ To examine the patterns of the use of maternal care by pregnant women.
- ❖ To investigate the determinants of utilizing maternal care from medically trained providers.

### c) Hypotheses

The study, considering only the demand side factors, hypothesized that

- Populations in higher socio-economic conditions are likely to use maternal health care services from medically qualified sources more than are those relatively in low socio-economic conditions in rural Bangladesh
- Poor knowledge and negative attitude of people towards the public sector healthcare service decreases the use of maternal care services in rural Bangladesh.

These hypotheses will be discussed and verified in the result section of the paper based on the data and information collected.

## III. LITERATURE REVIEW

The use of health services is influenced by the characteristics of the health delivery system for example, accessibility, quality, and cost of the services [Chakraborty et al. (2003)]. However, even where there is a good supply of services, those services may not be fully used [3]. Even under the same circumstances of availability, some women are more likely to use services than others. Therefore, a health delivery system is not the only factor that determines the level of use of health care services. Other factors such as social characteristics and structure influence the use of health care services. Several studies have shown that socio-demographic factors affect the utilisation of maternal health care services. Below a review of the empirical evidence of the selected demand side factors that affect the utilisation of maternal health care services has been given.

Chowdhury et al. (2003) found that educated women are more likely to seek treatment from doctors/nurses than women who were not educated in Bangladesh. The results of their multivariate analysis showed that women with secondary or higher education were almost 1.8 times more likely to seek treatment from doctors/nurses to treat their antepartum morbidities than the women who were not so. A study of 80 Bangladeshi women in two different districts, performed by Kalim et al (2009), found a significant relationship between maternal years of education, literacy rates, and the

utilization of skilled birth attendants and maternal mortality rates.

The media can bring about changes in people's attitudes towards the use of modern maternal care services. Literature suggests that mass media are effective in information dissemination, which increases awareness about innovations, and fosters inter-personnel communication, which could facilitate behavioral changes allowing for the adoption of new/different behaviors (Valente et al., 1996).

Chakraborty et al. (2003) in their paper examined a number of predisposing and enabling factors that influence the use of maternal health care services in Bangladesh. The results show a high level of association between certain predisposing and enabling factors and use of maternal health services and they have found that women's education, husband's occupation, and influence of severity of disease condition in explaining the utilization of maternal health care are significant. Sunil et al. (2005) observed the relative effect of women and their husbands' education on use of maternal care services in rural India using data obtained from National Family Health Survey -2. They did not only find positive significant relative effect of spousal education on use of maternal care services, but also found impact of women education was higher in comparison to their husbands' education. They have also found women's mass media exposure was a positive and significant factor affecting the utilization of maternal care services in rural India. According to them, the percentage of utilization of maternal care services was about 19 percent almost a double for women who were exposed to media than the 10 percent of women who were not exposed to any medium of mass media.

Syed Azizur Rahman (2001) has found among the socio-economic factors - family education, income, negative attitude towards the services available were significant both individually and jointly with the variations of use of MCH services.

Additionally, women's age is an important factor which may influence the use of maternal health care services. The association between a woman's age and the use of medical services has been found to be inconsistent across studies. Because of greater exposure to and knowledge of modern health care, younger women may make more use of modern health care facilities than older women. Several studies indicate older women are less likely to use skilled delivery assistance (Banerjee et al., 2008).

It is observed from various research findings that the relative effect of joint or large family was found negative on use of maternal and child health services (Wang et al., 1987; Mishra, 2000; World Bank, 2001; Chowdhury et al., 2003 and, Sunil et al., 2005). They reasoned that larger family size might have resource constraints to utilize health services comfortably as compared to smaller family size.

A study on safe motherhood programs in Bangladesh found that women's low status in society, strong cultural and traditional ties that deter women from delivering at health centres or with medically-trained attendants because their mothers have given birth "naturally" for generations (UNICEF, 2007).

Pokhrel and Sauerborn (2004) stated that the economic model assumes that factors such as price and income covariate with a set of other socio-demographic and need factors, producing the demand for health care, usually represented by health care utilization.

As Mishra (2000) claimed that knowledge about health centre near by residence of the respondents may also have positive and significant effect on the utilization level of maternal and child health services.

Moreover, women's access to maternal health care has been expected to be limited by constraints on their autonomy, where female autonomy can be described as the ability of the women to make decisions within the household relative to her husband. Bloom et al. (2001) have found in the Indian context a positive relationship between female autonomy and the utilization of maternal care.

Several studies indicate a negative association between higher birth order and the use of maternal health care services (Babalola et al. 2009, Ekale et al. 2007). A study from India affirms that women with more than two children are less likely to deliver at health facilities (Banerjee et al. 2008).

So cultural barriers and traditions as well as lack of information prevent women from accessing maternal and newborn health services. There is also little understanding about the need for rest and additional nutritious food during pregnancy. Moreover, the low status of women within the family means women will have her health care decided by her husband. Often her mother-in-law will be a key decision-maker. Despite being available, the utilization of emergency obstetric and neonatal care services is still low as well as postnatal care use. Families often ignore very simple healthy practices or do not accept them because it is against tradition or common belief. Similarly most people are not able to recognize when it is necessary to seek care for the mother.

#### IV. CONCEPTUAL FRAMEWORK

The purpose of this study is to identify the determinants of maternal care utilization. To identify the determinants of maternal care utilization, a conceptual framework can be used.

The Anderson's behavioral model of health service use has widely been used to understand the determinants that affect the utilization of health use. In specifying the factors determining the type of provider chosen, this study used the modified version of the

behavioral model. The following figure is depicting the framework-

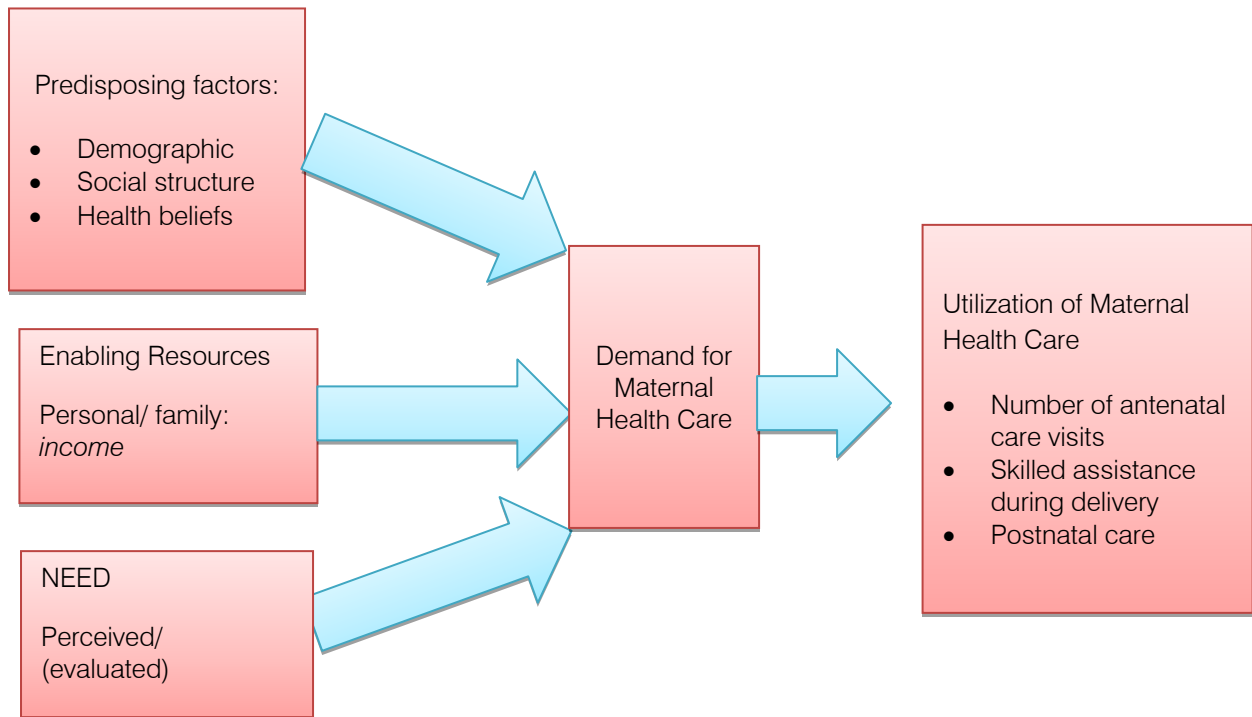


Figure 1.1: The conceptual framework depicting the relationship between selected control variables and maternal health care utilization.

In the framework, the demographic factors include age, gender, family size, number of previous pregnancies. Social structure involves education, occupation and religion. Health beliefs are the knowledge about health and health care system; for example, attitudes towards disease and medical care. Enabling factors are factors that make the individual able to obtain health care services, such as husband's occupation, family income, land holding. Need factors – which are considered to be the most immediate cause of health service use – Information about risks of childbirth and about service availability in radio or TV should increase use, Pregnancy wanted, Perceived quality of care. In this study it is expected that these factors determine demands for maternal care and as a result the utilization of maternal care.

## V. METHODOLOGY

This study was a cross-sectional study carried out from December 25, 2015 to January 5, 2016 and the purpose was to determine the demand side factors that affect the utilization of maternal care services. Rural Bangladesh survey has been conducted in Udaypur Aruakandi Village of MollahatUpazila, Bagerhat district, the south-western part of Bangladesh. The Udaypur Aruakandi village is 1 km away from the UHC. But most of the deliveries in that area occur with traditional birth attendants and many pregnant women do not seek care during pregnancy, sometimes they seek care from

unqualified providers, a common situation in many rural area of Bangladesh which may have serious health consequences. Therefore, this village has been chosen to identify what the factors are that determine the utilization and non-utilization of maternal care services from qualified providers.

With a view to permitting scientifically grounded estimates to be made from the survey, the intention was to adopt probability sampling. The target population of this study was the women aged 15-49 years who have already given birth within 2.5 years or were pregnant at the time of data collection in a rural village of Bangladesh. The main specific issue was: to estimate the proportion of women using maternal care during pregnancy from qualified providers and identify the factors that affect the utilization of that care. The proportion was the main indicator of the survey. According to BDHS, 2014 report, the utilization of antenatal care from medically trained providers in rural Bangladesh is 58.6%. By considering this value, the value of probability has been assumed as .58 in the sampling formula. The formula for sample size calculation,

$$n = \frac{Z^2 P (1-P) (deff)}{d^2}$$

Where, n= sample size; Z = value of the standard normal variable, which is equal to 1.96 at 5% level of significance; p = expected use rate of health

care,  $deff.$  = design effect;  $d$  = the level of precision required or maximum error deemed acceptable. Using  $p=.58$ ,  $Z=1.96$ ,  $deff=1.5$ ,  $d=.10$ , the required sample size was  $n=140$ . But due to time and resource constraints sample size was limited to the number 60.

The list of households was collected from the BBS, 2011 data. According to the list there are 287 households in the village. The households were divided into 5 groups, 3 of these consisting of 57 households and the other two each consisting of 58 households. Then 3 of them were selected randomly, the primary sampling units. After selecting the groups of households, then author started walking from one corner until 20 eligible women were interviewed in each group. In most of the households at least one woman satisfied the criteria. Thus 60 women were interviewed from the 3 PSUs, 20 from each. The instrument that was used for collecting data was a structured questionnaire for face-to-face interviews, which was designed under the guidance of the advisors. That structured questionnaire was used to collect information from the respondents to identify the level and type of maternal health care use, and determinant factors that affect the utilization. If the woman had more than one child within the 2.5 years preceding the survey, information on the use of antenatal care was collected for the last birth.

After the data collection, checking and appropriate editing, to find the association of utilization of maternal care with and the factors, data was analyzed using standard statistical packages. Excel-2013 was used for data entry and as the dependent variable is dichotomous, a multivariate logistic technique has been run using STATA-13 software.

## VI. RESULTS

A total of 60 women were included in the study. The mean age of the respondents was 23.7 ( $\pm .63$ ) years ranging from 17 to 40 years, majority (62%) were in the age group 20-25 years. 27% of the respondents were with education level below class five, 62% of the respondents were with education level that is from class five to class eight, only 8% are with education level from class nine to twelve, only 3% were above HSC level. Regarding occupation of the respondents, 88% were housewives followed by 6% students, 2% service holders, 2% doing business, other 2% were doing part time jobs. 11% of the women were pregnant for the first time and has not given birth yet, 36.6% has one child, 33.33% of the respondents has 2 children, 8.33% has 3 children, 5% has 4 children, 3.33% has 5 children, followed by 1.67% has 6 children. The average family size of the respondents is 4.8 ( $\pm .21$ ), where the family size ranges from 2 to 10 in number. All households living in the village are Muslims.

Among the 60 respondents, 52 has already given birth within the past 2.5 years, and the rest 8

women were pregnant at the time of data collection. 82% of the pregnancies were wanted, followed by 18% unwanted pregnancies. 60% women have some idea about the importance of using antenatal care and the rest have no idea. 83% of the respondent women received TT vaccine during their pregnancy. Among the 60 women, 36 (60%) received antenatal care and 24 (40%) did not receive antenatal care at all. Most of the respondents, about 88%, received antenatal care from the qualified providers and the rest 12% received the care from informal providers like homeopathic doctor, pharmacist etc. Only 30% of the antenatal care receiver made 4 ANC visits, 36% made one visit, 11% could not remember the number of visits. Respondent women without any formal education did not receive ANC at all, followed by 32% of the women in the education level class one to five, 86% of the respondents who attended secondary level, 100% of the respondents who attended the higher education made antenatal care visits at least once. 30% of the women in the age group 25-30 years received antenatal care, 100% of them from qualified providers, among women in the age group above 30 years, 50% received antenatal care from qualified providers. Only 57% of the respondents who are housewives received antenatal care (60% of which are from qualified providers); followed by service holders, students, and who do some part time activities for money all (100%) are user of antenatal care from qualified providers.

Fifty two women among the sixty respondents have given birth. Most of the delivery (73%) occurred at home, 25% of the delivery took place at private clinics, only 2% delivery took place at the UHC. 98% delivery outcome was normal child, followed by only one percent dead child. 49% of the delivery were by trained attendants (doctor, nurses, CSBA, FWV), of which 23% births were delivered by Cesarean section (C-section). 51% of the delivery were attended by traditional birth attendants and relatives. 100% of the women whose annual family income are above tk. 200000, 71% whose annual family income are 96000, 59% whose annual family income are 120000, 75% whose annual family income are 144000 received antenatal care.

The data in this study shows that only 42% of the mothers received postnatal care within 42 days after delivery, the other 58% did not receive any postnatal care. 82% of the postnatal care receiver received it from medically qualified providers (MBBS doctor, nurses, FWVs etc.), the other 18% received it from informal providers (kabiraj, pharmacists, homeopathic doctors etc.). According to them, the reasons for choosing the unqualified providers are problem was not so serious, low cost, well behave of providers, availability etc. majority (55%) of the women received postnatal care among the age group 20-25 years and the utilization is lowest (25%) among the adolescent mothers. Results also shows that all women (100%) with no formal

education did not received postnatal care at all and the utilization of postnatal care was highest (63%) among women who have attended the secondary level of education. Women who do some part time activities for earning money, all of them have used postnatal care, the utilization of postnatal care is low among housewives and those who have used only 43% of them used from qualified providers. The utilization of postnatal care is highest (100%) among both women whose husbands work outside the country and students.

a) *Logistic Regression Analyses*

The outcome variable being dichotomous, logistic regression analysis has been carried out by

taking each independent variable against the outcome variable to estimate the effect of the indicator variables on the outcome variable. To determine the demand for maternal care among the women in the village, logit regression analysis was conducted. There are three regression equations: one for antenatal care use, another for skilled birth attendance at delivery, and the last one for the use of postnatal care.

*Determinants of ANC Utilisation:* Results from multivariate logistic regression models for antenatal care utilization are given in following table-1,

*Table-1:* Results of multivariate logistic regression analyses of utilisation of antenatal care

Explanatory Variables	Dependent Variable: utilization of antenatal care from qualified providers (1=ANC visit, 0=no ANC visit) (Average marginal effects)	P value
Age of the woman (in years)	-.0407455	0.067
Education of the woman(in years)	.0170818	0.079
Occupation of woman (=1 if housewife, =0 otherwise)	-.2755223	0.191
Education of the household head (in years)	-.0380068	0.194
Husband's occupation (=1 if day laborer, =0 otherwise)	.2770648	0.063
Family size ( in number)		
High Birth order	-.1193902	0.064
Household income(in taka)	9.34e-07	0.350
Family structure (=1 if single, =0 if combined)	.0520282	0.011
Watch TV(=1 if watch, =0 if do not watch)	.1080109	0.072
Listen to radio (=1 if listen, =0 if do not listen)	-.0297394	0.793
Wanted pregnancy	-.0012503	0.995
Perceived quality (=1 if good, =0 if bad)	.1896817	0.061
Women's decision making power (1=yes, 0=no)	.1896817	0.061

Source: Author's computation

The age of the women is negatively related to the use of ANC. As age increases by 1 year, on an average, the likelihood of utilization of antenatal care decreases by .041 and the result is significant at 6% level. Banerjee et al. has also found this negative relationship with age. Education of woman is positively related to the likelihood of using antenatal care. As education increases by 1 year, on an average, the probability of antenatal care increases by .097 and the result is significant at 8% level. The husband's education reduces the likelihood of using antenatal care from qualified provider but the result is insignificant as the p-value is large.

If the woman is housewife, the probability of antenatal care visit decreases by .27 compared to a woman with other occupation (either student, or service holder, or do some part time jobs), on an average but the p value is large (.191). The household income has a positive association with the utilization of antenatal care

from a qualified source but the result is insignificant. Women who watch TV, for them the likelihood of utilizing antenatal care increases by .11 compared to other who do not watch TV. Watching TV and reading has a positive significant impact on antenatal care use. The multivariate logistic regression results show a negative insignificant impact on the utilization of maternal care. Here, watching TV and listening radio are serving as the proxies for consciousness about different health related matters, especially maternal health.

By running a bivariate logistic regression model where ANC visit (1=yes, 0=no) is the dependent variable and wanted pregnancy (1= wanted, 0= unwanted) is independent variable, there has a significant positive impact (at p-value 8%) on the likelihood of use of ANC. But after controlling for other variables like education, age, occupation, perceived quality, knowledge about the nearest health facilities, women's decision making power, the intendedness of

pregnancy has a negative impact on the likelihood, but it is highly insignificant (p-value is .995).

The perceived quality of nearest health facilities has a significant impact on the utilization of maternal care. The women who think the quality is good, on an average, their probability of using antenatal care from qualified sources increases by .18 compared to others who think the quality to be bad. The women's decision making power is significantly associated with the utilization of maternal care. The likelihood of using antenatal care for a woman of a single family is on an

average .052 higher compared to a woman from a combined family structure and the result is highly significant (p value=.01).

The pseudo R<sup>2</sup> in this model is .60. Though the pseudo R<sup>2</sup> is not so high, the explanatory variables have explanatory power.

*Determinants of Use of care from SBA at delivery:* The result of multivariate logistic regression model for the use of maternal care has been represented in the following table,

**Table-2:** Results of multivariate logistic regression analyses of the utilization of delivery care from SBA.

Explanatory Variables	Dependent Variables: (1=SBA,, 0=not SBA) (Average marginal effects)	P value
Age of the woman (in years)	.019	0.48
Education of the woman(in years)	.0589723	0.093
Occupation of woman (=1 if housewife, =0 otherwise)	-.1059744	0.033
Education of the husband (in years)	.032427	0.033
Husband's occupation (=1 if day laborer or farmer, =0 otherwise)	-.0282797	0.874
Birth order	-.1628903	0.071
Household income(in taka)	-7.29e-07	0.529
Family structure (=1 if single, =0 if combined)	-.1791702	0.176
Intendedness of pregnancy (=1 if wanted, =0 if unwanted)	.1630559	0.085
Watch TV(=1 if watch, =0 if do not watch)	.0788669	0.070
Listen to radio (=1 if listen, =0 if do not listen)	-.0837846	0.210
Perceived quality (=1 if good, =0 if bad)	.3948859	0.018
Women's decision making power (1=yes, 0=no)	.048071	0.028
ANC visit (1=yes, 0=no)	.0930675	0.052
Attendant choice by mother in law (1=yes, 0=no)	-.1040598	0.080

Source: Author's computation

Increase in women's age increases the likelihood of using care from SBA in time of delivery by .019, on an average but the variable is insignificant (p value is .62). Both education of a woman and the education of her husband increases the probability of using the delivery care from a skilled birth attendant, where both the variables are significant (p value is less than 10%). If a woman is housewife, her likelihood of using maternal care on an average, decreases by .11 than a woman who is not housewife and the result is significant. If the husband of a woman is day laborer or a farmer, on an average the likelihood of her use of care during birth from SBA decreases by .03 compared to women whose husbands' are of other occupation but the result is insignificant due to the p-value is high. Household income is showing a negative impact and the result is insignificant (p-value is high). High birth order has a significant negative impact on the likelihood of using care from SBAs.

Watching TV has a significant positive impact on the utilization of care from SBAs at time of deliveries while listening radio is showing an insignificant negative impact on the probability of using care from SBAs. Woman whose pregnancy was wanted has a significant

positive impact (with p value .08) on the likelihood of using skilled birth attendant as an assistance at delivery.

Women who perceive the quality of nearest health facilities to be good their probability of use of delivery care from SBAs increases by .39 compared to them who perceive the quality not to be good enough and the result is highly significant. On an average, woman who made the ANC visit during pregnancy has an increased likelihood of using the care from SBAs during delivery compared to women who do not made ANC visit. Likelihood of using care from SBAs declines by .104 if the mother in law made the choice of attendant at delivery and the result is significant (p value=.08).

Pseudo R<sup>2</sup>: Pseudo R<sup>2</sup>is .55. So the model fits moderately well.



b) Determinants of Postnatal care utilization

Table-3: Results of multivariate logistic regression analyses of the utilization of postnatal care.

Explanatory Variables	Dependent Variable: use of postnatal care (1=received postnatal care from qualified providers, 0=did not seek postnatal care or seek care from informal sources) (Average marginal effects)	P value
Age of the woman (in years)	-.0046187	0.847
Education of the woman(in years)	.0158037	0.077
Occupation of woman (=1 if housewife, =0 otherwise)	.3310671	0.251
Education of the household head (in years)	.0451985	0.103
Husband's occupation (=1 if day laborer, =0 otherwise)	-.2019506	0.270
Birth order (in number)	-.142351	0.080
Household income(in taka)	2.49e-06	0.080
Family structure (=1 if single, =0 if combined)	-.1124638	0.348
Intendedness of pregnancy (=1 if wanted, =0 if unwanted)	-.0033296	0.989
Watch TV(=1 if watch, =0 if do not watch)	.27722	0.025
Listen to radio (=1 if listen, =0 if do not listen)	.1220926	0.014
Knowledge about nearest health facilities (=1 if yes, =0 if no)	.2798133	0.013
Perceived quality (=1 if good, =0 if bad)	.2255077	0.050
Women's decision making power (1=yes, 0=no)	.075726	0.351

Source: Author's computation

Age of women reduces the likelihood of using postnatal care from qualified providers but the result is insignificant. Both the women education and the education of their husbands have significant (p value < .10) positive impact on the likelihood of utilization of postnatal care, on an average.

Both the occupation of husbands and the occupation of women is not showing any significant impact on postnatal care utilization. Watching TV, listening to radio, perceived quality to be good, knowledge about nearest health facilities have significant impact on likelihood of postnatal care utilization. Women who has some ability to make decision in the family are more likely to use postnatal care than those who don't have that ability but the result is insignificant (p value=.351).

## VII. DISCUSSION

Results showed that 53% of the women in the study area received antenatal care from a medically trained provider which is low compared to the use by 64% of the women according to BDHS, 2014. Making 4 ANC visits is only by 30% women. 49% of the delivery were attendant by SBAs which is greater than the rate in Bangladesh 42% according to BDHS report. Only 35% of the women received post natal care from medically qualified providers. So the utilization of post natal care is very low.

The use of antenatal and post natal care from informal providers is very low 12% and 18% respectively. The results of our study showed that mothers with higher education had the highest percentage of adequate ANC use compared to those with no or

primary education. This result is consistent with Shahjahan et al (2012). Women who are students and service holders, 100% of both of them utilized ANC from medically qualified source. Women who has already three living children, did not seek antenatal care at all. Women from single families utilize formal ANC care more than women from combined family structures. Low use of ANC among those who has not enough ideas about the availability of services, who perceive the quality to be bad.

The findings show that age is an important factor in determining the use of skilled assistance, early antenatal care visits and more than four antenatal visits. Older women are less likely to utilize maternal health services compared to younger ones. This finding is similar to a study by Ochako (2003) in which young women are more likely to seek skilled assistance in health facilities in comparison to older ones. Banarjee et al. (2008) also found such a negative association between age and maternal care.

In cases of use of care from SBAs during deliveries and the postnatal care from medically qualified providers also have almost similar pictures in relation to socio-demographic factors as well as knowledge of health facilities and perceptions about their quality.

As expected, use of antenatal services was more likely among the literate women than among the illiterates. The use of maternal care is significantly affected by education, which is consistent with the findings by Chowdhury et al. (2003), Kalim et al. (2009), Chakraborty et al. (2003). High birth orders also has a significant negative impact on the utilization of maternal

care from a medically qualified provider. This finding is supported by that of a study by Shahjahan et al (2012). A possible explanation for these results is that high-parity women have less desire to use maternal health care services due to a belief that they have experienced with pregnancy and childbirth and therefore do not need such services (6).

Knowledge about the nearest health facilities and the perceptions about the quality of services provided by those facilities have a significant impact on the utilization of maternal care from qualified providers. These findings are consistent with findings of study by Syed Azizur Rahman (2001)

Shunil et al. (2005) in the context of India found a positive relationship between use of maternal care and exposure to media. The result of the study shows that exposure to mass media (watching TV, listening to radio) was the variable that was significant for postnatal care use. Watching TV has significantly positive for both antenatal care use and use of SBA during birth but listening radio did not have significant impact on the likelihood of ANC visit, use of care from SBAs.

The use of maternal care has no significant relationship with the income level in this study. So the result is not consistent with other studies.

#### a) *Limitation of the Study*

This study has collected data from women of age 15 to 49 who have given birth within 2.5 years prior to the survey or were pregnant at that time. As the information was collected in regard to births 2.5 years preceding the survey, the accuracy of information relies on the ability of the respondent to recall. Therefore, there remains a chance of recall bias.

The household survey data have been collected from the female members of the households, those have less decision making power in family matters including seeking health care from different sources. Moreover, they have less knowledge about the income and expenditure of the family, as the majority (96%) of them is housewives. This was not anticipated during the design of the study. So future studies should include a considerable number of male members in order to get more precise information on those aspects.

Adequate sample size cannot be taken under consideration due to time constraints. Finally, this study focuses on a village only; therefore, its findings are difficult to generalize in the country as a whole.

## VIII. CONCLUSIONS AND POLICY RECOMMENDATIONS

Considering and analyzing findings of the study, it has been observed that the overall utilization of maternal care in the study area was at low level, especially delivery care from skilled attendants, postnatal care from qualified providers was low. The utilization of antenatal care and postnatal care from

unqualified provider is very low; many of them did not seek care at all. The study has identified a number of important factors that affect the utilization of maternal care. The findings indicate that formal education, number of living children, access to mass media, knowledge about nearest health facilities and the perception of the quality of the services provided, women's decision making power in a family are important correlates in using maternal care services from medical qualified providers. However, the effect of income on the use of maternal care is not significant. So economic factors themselves do not contribute much in bringing better health outcome in this case.

The evidence from this study suggests that public health policies aimed at reducing maternal morbidities and mortalities in Bangladesh should include strategies that will improve maternal health status through:

- Increasing maternal education at least up to secondary level in the country.
- Information, and communication on maternal care must be intensified in order to reach the rural mothers. Informal adult education for women and men can be employed as an immediate intervention to provide basic education and to increase awareness about basic maternity care.
- Campaigns against social norms that are harmful to women's health such as early marriage and high parity etc. The campaign for health awareness as a proxy of education may increase the demand for health services.
- Education programs to women of traditionalist beliefs on the importance of MHCS utilization. These programs can be routed through religious and traditional/community leaders.
- The health personnel need to be trained about maternal health services and should take part in educating their target populations on the importance of seeking maternal health care services on time from nearest health facilities.
- In a long run, women empowerment through informal education and income generating activities by informal education and vocational training for those groups of women may serve as an immediate strategy which will ultimately result in women's decision making power in the family as well as the use of maternal care.
- Involvement of husbands and mother-in-laws during information, education and communication are important to improve the use of ANC, SBAs at delivery, postnatal care.
- As unwanted pregnancies have a negative impact on the likelihood of using maternal care, so awareness about use of appropriate family planning method should be raised to avoid unwanted pregnancies.

Further studies are required to be carried out in this issue involving different areas which will clearly show the effect of variation on the use of maternal care.

#### Competing Interest

The authors declare that they have no competing interests.

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