

Original article

The association between voucher scheme and maternal healthcare services among the rural women in Bangladesh: a cross sectional study

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Abstract

Background: Maternal health voucher scheme, providing financial support to poor women, is popularly known as subsidies in maternity care services including antenatal, delivery and postnatal care and also economic barriers while seeking treatment from qualified service providers. The aim of this study is to evaluate the association of voucher scheme on receiving maternal healthcare services among the rural women in Bangladesh. **Methods:** This is a cross sectional study where total sample size was (n=500) rural women who were selected by using convenience sampling method. Among them, 250 women were voucher scheme receivers and other 250 women were non-voucher scheme receivers. A structured questionnaire was adopted for data collection between November and December 2015. In the final analysis, cross tabular analysis and logistic regression model were used, and adjusted odds ratios (ORs) were reported. **Results:** The study found a strong relation between voucher scheme and maternal healthcare services among the rural women in Bangladesh where majority (88.4%) voucher scheme receivers received information or treatment of Reproductive Tract Infections (RTIs) and Sexually Transmitted Infections (STIs) while non-voucher scheme receivers received only 10%. Most of the respondents (93%) voucher scheme receivers received at least 3 times of antenatal care visit; but only 28% received non-voucher scheme receivers at least 3 times of antenatal care visit. Voucher scheme receivers received 17.127 times more likelihood to receive skilled birth attendance and 25.344 times more likelihood to receive institutional delivery services and positively significant (5 percent) compared to those who did not receive maternal health voucher scheme. Moreover, 92.4% voucher receivers received transport cost and 73.2%, received safe home delivery services while 22.8% non-voucher scheme receivers received transport cost and only 20.4% received safe home delivery services. Majority (94%) voucher scheme receivers received long time birth control services while only 19.2% non-voucher scheme receivers received long time birth control services. **Conclusion:** Women who did not receive maternal health voucher scheme found the status of lower antenatal, delivery and postnatal care services receiving trends compared to the women who received the maternal health voucher scheme. It is recommended an effective monitoring system and necessary interventions getting overall developed health status in Bangladesh.

Keywords: Maternal healthcare; voucher scheme; association; rural women; home delivery; antenatal care; postnatal care

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Background

Maternal mortality in many countries, especially in Sub-Saharan Africa and Asia, remains high with huge poor-rich inequalities.¹⁻³ Maternal mortality and morbidity remain high in Nepal, India, Bangladesh and Pakistan, and policy in the region has focused

increasingly on skilled attendance at birth to reach Millennium Development Goal 5.³⁻⁵ Besides transport and time costs, formal and informal fees in public health services constitute a substantial financial barrier for poor women to access maternal health services.⁶ A maternal and child health voucher

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scheme comprising a subsidization for pregnant women to receive four antenatal care (ANC), delivery and postnatal care (PNC) free-of-charge was planned to help women overcome financial barriers in addition to raising awareness of ANC and delivery with skilled birth attendants (SBA), which can reduce the rate of maternal and neonatal death.⁷ The increased use of maternity services such as antenatal care, attended deliveries, and postnatal care yield better maternal and infant outcomes⁸; increased family planning utilization allows for healthier birth spacing⁹; and it was also found that cost was one of the most important barriers for not seeking ANC and PNC services in Bangladesh where it suggested providing financial support to poor women to reduce catastrophic health expenditures, especially for delivery, RTIs and STIs related services.^{10,11} Several reasons for the low utilization of maternal health care have been documented.¹² However, vouchers are a specific demand-side financing mechanism that can be used to target essential health services to vulnerable populations such as poor, pregnant women and to protect them from catastrophic expenditures such as emergency obstetric care¹³ where poor women specially are highly targeted, voucher interventions are expected to improve health outcomes among the poor.⁵ Vouchers are introduced because of the two main reasons are lack of knowledge about maternity care services including antenatal, delivery and postnatal care and economic barriers while seeking treatment from qualified service providers; these findings clearly indicate the need to improve maternal health services through the provision of education, counseling, referrals, and by providing financial support to poor women.¹¹ Poor pregnant women have to overcome many barriers to deliver in a health facility with trained health professionals.¹⁴ If the voucher scheme in Bangladesh is found effective, it may help other countries to adopt this approach for improving utilization of maternity care services for reducing maternal mortality.¹⁵ It strongly indicates that voucher programs have been successful in increasing the utilization of health services.¹⁶ Moreover, poor women were substantially more likely to take advantage of the voucher scheme than non-poor women.¹⁷ Therefore, the objective of this study was to identify the associations between voucher scheme and maternal healthcare services among the rural women in Bangladesh.

Theoretical Framework

In many developing countries of the world, voucher scheme, a subsidized voucher model, introduced as

financial assistance for the rural women to enable the poor to receive maternal health care services. Vouchers utilized the health care services among the pregnant women belonging to families below poverty line, or members of poor households with a particular disease, or those who require to be screened for the presence of a particular disease etc.¹⁸ Sandiford et al. (2005) showed that vouchers can fulfill the demand side subsidy strategies to stimulate demand for under-consumed services and the effect of the subsidy on consumer behavior begins before the beneficiary reaches the health services from a social welfare perspective, such as family planning.¹⁹ They are also useful when knowledge of the existence of these services is poorly disseminated within the community, as vouchers can guide patients to these services, for example to obstetric care, thereby raising awareness of the importance of the services and in most cases, using civil society organizations to implement such schemes is seen to be the best approach, since these organizations have local knowledge about the community.^{18,19} Sandiford et al. (2005) also found that vouchers increase patient satisfaction by offering the most convenient, comfortable and best quality service.¹⁹ The capacity of voucher schemes to increase the responsiveness of service providers, to target subsidies more accurately and to animate and guide patients towards services and therefore increase the use of these services is one of the more attractive characteristics of voucher schemes, especially when one wants to increase the utilization of priority health services by poor and vulnerable populations such as immunization, reproductive health, preventive care like cancer screening, voucher scheme financial transfers to reduce financial barriers, pay-for-performance to health workers for community mobilization etc.^{18,19} There are a number of examples of Community Health Insurance (CHI) schemes that have been put in place mainly to make services available and accessible to the most vulnerable members of the population, and to reduce the burden of health costs on households.¹⁸ However, given that poor maternal-child health (MCH) indicators are more likely in low development and high conflict regions, it is possible that the associations between maternal health voucher scheme and poor MCH are simply an artifact of the low development and insecure context. This study is not based on any single theoretical framework for analyzing effective factors of maternal health care services related to maternal health in Bangladesh; but multiple frameworks inform this study in developing

its research guidelines and constructing its analysis plan, supporting its arguments.

Methods

Study site, design and participants

This cross sectional study was conducted in seven Upazilas (sub-districts) of Bhola district, Bangladesh among the rural women aged 15-49 years old from November to December 2015. The samples were classified as either voucher scheme recipients or non-voucher scheme recipients. Of the seven sub-districts, 1723 households (HHs) were selected randomly. Finally, 524 HHs selected for data collection by using convenience sampling, and 500 women agreed to participate, comprising 250 voucher scheme recipients and 250 non-voucher scheme recipients, with a participation rate of 95.42%. There are 60 unions in seven sub-districts and from each sub-district 4 unions were selected randomly. Total unions were taken 28 among 60 unions for the data collection. 89 women interviewed from Bhola Sadar Upazila, 112 women interviewed from Burhanuddin Upazila, 43 women interviewed from Charfasson Upazila, 56 women interviewed from Daulatkhan Upazila, 42 women interviewed from Lalmohan Upazila, 132 women interviewed from Manpura Upazila, 26 women interviewed from Tazumuddin Upazila. Finally the study sample size estimated as 500 in total. To be eligible for the study, women were required to: (a) live in the study locations during the survey; (b) age 15-49 years old ever married women, (c) received voucher scheme from January 2014 to December 2015, and (d) at least have one pregnancy experience. Only one woman from each household (HH) was interviewed if more than one eligible woman were found. If an eligible woman was not found in a HH, an adjacent HH was approached. Although selected conveniently, the study attempted to get a sample from different religions, socio-economic conditions. However, difficulties in obtaining a representative sample based on the above mentioned criteria included the remote locations of these seven study sites, transportation problems and lack of educated female interviewers.

Data collection

A structured questionnaire was adopted for data collection between November and December 2015 covered the following: age, parity, the educational status of women and their husbands, the socioeconomic status including household income. All of the respondents were women and were selected from 15 to 49 years old. When the data was collected, the entire questionnaire was checked and verified.

Before data collection, questionnaire was developed several times as getting outputs through several pre-tests. Then questionnaire developed and prepared with the found inputs and finalized for final data collection. Eight research assistants were employed and trained for data collection. The authors also participated in data collection.

Outcome measures and Covariates

The outcome variable used in this study was use of Maternal Health Care Services (MHCS), including antenatal, delivery and postnatal care services. Demographic, socioeconomic and spatial factors of the respondents were considered as covariates. Thus, the variables for bivariate and multivariable analyses were age, religion, income, education and occupation of the respondents, education and occupation of respondents' husbands, parity and exposure to mass media. Only significant at 5 percent variables were included in the final analysis.

Statistical analysis

The Statistical Package for Social Sciences software (version 20.0; SPSS Inc. Chicago, Illinois, USA) was employed for data analyses. Bivariate analyses were performed based on cross tabulations using chi-square tests, and multivariable analyses were conducted using multivariable logistic regression analysis. Only variables found significant ($p < 0.05$) in bivariate analyses were entered into the multivariable logistic regression model, and adjusted odds ratios (ORs) were reported. Women's exposure of mass media and husbands' occupation and education, parity were excluded in the final regression model because they were concentrated in one category of independent variables. Associations were viewed as significant if the OR had a p value of ≤ 0.05 as the criterion for statistical significance of associations and were reported. Interaction factors were analyzed, but not included in the final model, as they were not found to be significant. To test the difference between the cases and the controls, the study used the chi-square or Fisher exact tests, as appropriate, for categorical variables, and Student's t test, for continuous variables. On analyzing effects of voucher scheme the study used the participants who did not receive voucher scheme as a reference.

Results

Socio-economic and Demographic Characteristics of the Respondents

Table 1 shows the socio-economic and demographic characteristics of 500 respondents in this study. The findings of this study showed that 86.6% of the respondents were Muslims and only 13.4% were

Hindus. 89.4% were housewives while only 10.6% were involved in agriculture or farming. Most of the respondents (77.8%) were more than 18 years old, while 22.2% were in the age group of less than 18 years old. The level of education of the respondents revealed that 52.4% received primary or below education, 29.4% received secondary education and 18.2% received higher education. Interestingly, the findings of this study also revealed that 63.8% is in the income level of 1-1000 taka, 7.8% in the income more than 2000 taka and 28.4% of respondents had no income.

Table 1: Socio-economic and Demographic Characteristics of the respondents (n=500)

Variables	n	%
Respondent's Age		
Less than 18 Years	111	22.2
More than 18 Years	389	77.8
Respondent's Education		
≤Primary	262	52.4
Secondary	147	29.4
Higher	91	18.2
Respondent's Occupation		
Housewife	447	89.4
Agriculture/ Framing	53	10.6
Respondent's Income*		
0	142	28.4
1001-2000	319	63.8
More than 2000	39	7.8
Respondents' Religion		
Islam	433	86.6
Hinduism	67	13.4

*USD 1=80 taka

Antenatal Care Services and Voucher Scheme

Table 2 shows the cross tabulation between antenatal care services and voucher scheme. The study found that 93% respondents of voucher scheme receivers received at least 3 times of antenatal care visit while non-voucher scheme receivers received only 28% significant at $p < .05$. Of 250 surveyed voucher scheme receivers, 64.8% received childbirth related information and services, 92.4% received physical examination services and 93.2% received emergency treatment and medicines. But of 250 surveyed non-voucher scheme receivers, 6.4% received childbirth related information and services, 18.4% received physical examination and 12% received emergency treatment and medicines. Majority (88.4%) respondents received information or treatment of RTIs and STIs while only 10% non-voucher scheme receivers received information or treatment of RTIs

and STIs. 93.6% respondents of voucher scheme receivers received Tetanus Toxoid (TT) vaccination, 94% received Blood screening for HIV and 35.6% respondents received Anemia evaluation related care services in their antenatal period. Only 49.6% respondents of non-voucher scheme receivers received TT vaccination, 13.2% received blood screening for HIV and 14% respondents received Anemia evaluation related care services.

A multivariable logistic regression model was fitted to explore factors related to the utilization of antenatal care services among rural women (Table 5). Respondent's age, education, occupation, income and religion were significantly associated ($p \leq .05$) with antenatal care services. Multivariable logistic regression analyses suggested that women who received voucher scheme 14.620 time more likelihood to receive TT vaccination and 1.001 time more likelihood to receive anemia evaluation services both significant at 5 percent. Respondent's higher level of education and income both utilized the antenatal care services to receive among the rural women where the respondents who had higher level of education 9.960 times more likelihood to receive emergency treatment and medicines compare to those who had lower level of education. Respondents who had more than 2000 taka income 11.011 times more likelihood to receive childbirth related information and services (significant at 5 percent) compare to the respondents who had less income. On the other hand, respondent's age, occupation and religious status also significantly associated with the antenatal care services along with voucher scheme receiving status. The rural women who involved with the agriculture or farming activities, they received 1.032 times more likelihood to receive at least 3 times antenatal care visit and also 2.249 times more likelihood to receive childbirth related information and services and also 1.034 times more likelihood to receive emergency treatment and medicines compare to those who were housewives (significant at 1 percent).

Delivery Care Services and Voucher Scheme

In Table 3, of 250 voucher scheme receivers surveyed women, 91.6% received skilled birth attendance related services and 91.2% received institutional delivery services while non-voucher scheme receivers received only 26% skilled birth attendance related services and 24.4% received institutional delivery services and found statistically significant with voucher scheme. 92.4% voucher receiver respondents received transport cost, 73.2%, safe home delivery services and 94% received referral to

Table 2: Antenatal Care Services and Voucher Scheme

Antenatal Care Services	Voucher Scheme Receivers		Total n (%)	Non-voucher Scheme Receivers		Total n (%)	Pearson Chi-square (p-value)
	Facilitated %	Non-facilitated %		Facilitated %	Non-facilitated %		
	At least 3 times antenatal care visit	93.0		7.0	250 (100)		
Childbirth related information & services	64.8	35.2	250 (100)	6.4	93.6	250 (100)	.000
Physical Examination	92.4	7.6	250 (100)	18.4	81.6	250 (100)	.000
Receive emergency treatment and medicines	93.2	6.8	250 (100)	12.0	88.0	250 (100)	.000
Information or treatment of RTIs and STIs	88.4	11.6	250 (100)	10.0	90.0	250 (100)	.000
TT Vaccination	93.6	6.4	250 (100)	49.6	50.4	250 (100)	.000
Blood screening for HIV	94.0	6.0	250 (100)	13.2	86.8	250 (100)	.000
Anemia evaluation	35.6	64.4	250 (100)	14.0	86.0	250 (100)	.000

any doctor. But 22.8% non-voucher scheme receivers received transport cost, 20.4% received safe home delivery services and 22.2% received referral to any doctor. Majority (89.2%) voucher scheme receivers received obstructed labor related services while 66.8% non-voucher scheme receivers received obstructed labor related services.

A multivariable logistic regression model was fitted to explore factors related to the utilization of antenatal care services among rural women (Table 6). Respondent's age, education, occupation, income and religion were significantly associated with antenatal care services. Multivariable logistic regression analyses suggested that women who received voucher scheme 17.127 times more likelihood to receive skill birth attendance and 25.344 times more likelihood to receive institutional delivery services positively significant at 5 percent. Respondent's education, income and religious status are changing the delivery care services receiving trends among the rural women in Bangladesh. Respondents' age more than 18 years of old 2.475 times (1 percent) more likelihood to receive safe home delivery services; respondents who had higher education level 1.445 times more institutional delivery services and 1.464 times more obstructed labor related services compare to the respondents who had lower level of education. The age above 18 years old of the women receive positively skill birth attendance, safe home delivery services, referral to any professional doctor and obstructed labor related services. The respondents

who had secondary level education are 3.294 times and higher level of education 2.194 times more likelihood to prepare for covering transport cost in their delivery period. However, respondents who belonged Hindu religion 2.007 times more likelihood to receive skilled birth attendance, 2.379 times more likelihood to receive institutional delivery services and 1.957 times more likelihood to receive obstructed labor related services (significant at 5 percent) compare to the respondents who belonged the Islam religion.

Postnatal Care Services and Voucher Scheme

Table 4 shows the cross tabulation between postnatal care services and voucher scheme. Of 250 voucher scheme receivers, 48.4% received birth control related services, 92.4% received regular health checkup, 78.8% received urine test and treatment for bacterial infection and 22.8% received follow up visits at home. But among 250 non-voucher scheme receivers surveyed respondents, only 26.4% received birth control related services, 18.4% received regular health checkup, 50.4% received urine test and treatment for bacterial infection and 11.2% received follow up visits at home. 88% respondents of voucher scheme receivers provided family planning methods while 38.8% of non-voucher scheme receivers provided family planning methods. On the other hand, majority (94%) voucher scheme receivers received long time birth control services and 82.4% received child bearing planning service. But only 19.2% non-voucher scheme receivers received long

Table 3: Delivery Care Services and Voucher Scheme

Delivery Care Services	Voucher Scheme Receivers		Total n (%)	Non-voucher Scheme Receivers		Total n (%)	Pearson Chi-square (p-value)
	Facilitated %	Non-facilitated %		Facilitated %	Non-facilitated %		
Skilled Birth attendance	91.6	8.4	250 (100)	26.0	74.0	250 (100)	.000
Institutional Delivery Services	91.2	8.8	250 (100)	24.4	75.6	250 (100)	.000
Transport Cost	92.4	7.6	250 (100)	22.8	77.2	250 (100)	.000
Safe Home Delivery Services	73.2	26.8	250 (100)	20.4	79.6	250 (100)	.000
Referral (i.e: Doctor)	94.0	6.0	250 (100)	22.0	78.0	250 (100)	.000
Obstructed labor	89.2	10.8	250 (100)	66.8	33.2	250 (100)	.000

time birth control services and 63.2% received child bearing planning services.

In Table 7, Multivariable logistic regression analyses suggested that women who received voucher scheme positively they received regular health checkup, urine test and treatment for bacterial infection, have follow up visits at home, child bearing planning services and long time birth control compare to non-voucher scheme recipients. The respondent who had higher level of education 1.190 times more likelihood to receive birth control than the respondents who had no education. Higher level of income and religious status are also responsible to receive postnatal care services among the rural women. The rural women who had in the income level of 1001-2000 taka

received 1.026 times more likelihood to receive child bearing planning services in their postnatal period and this is positively significant at 1 percent. Respondents who were more than 18 years old received 7.592 times more likelihood to do regular health checkup strongly significant (1 percent); 1.420 times more likelihood to receive urine test and treatment for bacterial infection and 2.209 time more likelihood to take long time birth control compare to the respondents who were less than 18 years old and positively significant at 5 percent. On the other hand, surveyed women who involved with agricultural or farming activities are 2.428 times more likelihood to take long time birth control compare to the women who were housewives significant (10 percent).

Table 4: Postnatal Care Services and Voucher Scheme

Postnatal Care Services	Voucher Scheme Receivers		Total n (%)	Non-voucher Scheme Receivers		Total n (%)	Pearson Chi-square (p-value)
	Facilitated %	Non-facilitated %		Facilitated %	Non-facilitated %		
Birth Control	48.4	51.6	250 (100)	26.4	73.6	250 (100)	.000
Regular Health Checkup	92.4	7.6	250 (100)	18.4	81.6	250 (100)	.000
Urine test and treatment for bacterial infection	78.8	21.2	250 (100)	50.4	49.6	250 (100)	.000
Provide Family Planning methods	88.0	12.0	250 (100)	38.8	61.2	250 (100)	.000
Have follow up visits at home	22.8	77.2	250 (100)	11.2	88.8	250 (100)	.000
Child Bearing Planning Service	82.4	17.6	250 (100)	63.2	36.8	250 (100)	.000
Long Time Birth Control	94.0	6.0	250 (100)	19.2	80.8	250 (100)	.000

Table 5: Association between socio-economic and demographic characteristics and use of antenatal care services (multiple logistic regressions)

Variables	At least 3 times antenatal care visit	Childbirth related information & services	Physical Examination	Receive emergency treatment and medicines	Information or treatment of RTIs and STIs	TT Vaccination	Blood screening for HIV	Anemia evaluation
Voucher Scheme Non-received® Received	.005**	.139**	.020**	1.29**	.758	14.620**	.007**	1.001**
Respondent's Age Less than 18 Years® More than 18 Years	.245*	.057*	1.294	.473	7.020	.995	.641	.589
Respondent's Education ≤Primary® Secondary Higher	.717 .868	.440 .200***	.280** .535	28.026** 9.960	.236 .608	1.014 1.533	.324** .294**	1.294 1.219
Respondent's Occupation Housewife® Agriculture/ Framing	1.032	2.240	.611	1.034***	.340	.643	.571	.069
Respondent's Income* 0® 1001-2000 More than 2000	.741 1.510	1.539 11.011**	.977 1.683	.128 .278	8.772 .998	1.393 1.591	.324* .608	1.466 1.519
Respondents' Religion Islam® Hinduism	1.738	.111*	3.831*	11.556	.308	1.842	.274	1.591

Significant at *.10, **.05, ***.01; Reference Category =®

Table 6: Association between socio-economic and demographic characteristics and use of delivery care services (multiple logistic regressions)

Variables	Skilled Birth attendance	Institutional Delivery Services	Transport Cost	Safe Home Delivery Services	Referral (i.e: Doctor)	Obstructed labor
Voucher Scheme Non-received® Received	17.127**	25.344**	1.750	.052**	10.040**	3.345**
Respondent's Age Less than 18 Years® More than 18 Years	1.505	.804	.720	2.475***	1.069	1.053
Respondent's Education ≤Primary® Secondary Higher	.684 .708	.988 1.445	3.294 2.194	.374** .558*	.372** .477	.839 1.464
Respondent's Occupation Housewife® Agriculture/ Framing	.623	.292**	.549	.927	.624	.211**
Respondent's Income* 0® 1001-2000 More than 2000	3.774** 8.108***	.634 .900	.671 .946	1.002 1.020	1.803 1.792	5.232*** 3.596**
Respondents' Religion Islam® Hinduism	2.007**	2.379**	1.878	1.655	1.866	1.957**

Significant at *.10, **.05, ***.01; Reference Category =®

Table 7: Association between socio-economic and demographic characteristics and use of postnatal care services (multiple logistic regressions)

Variables	Birth Control	Regular Health Checkup	Urine test and treatment for bacterial infection	Provide Family Planning methods	Have follow up visits at home	Child Bearing Planning Service	Long Time Birth Control
Voucher Scheme Non-received® Received	.286**	5.229***	3.904**	.758	14.104**	9.098	7.560**
Respondent's Age Less than 18 Years® More than 18 Years	.556**	7.592***	1.420**	7.020	.465*	3.243	2.209**
Respondent's Education ≤Primary® Secondary Higher	.530** 1.190	.133*** .985	.041** .997	.236 .993	.438 .722	1.279 1.998	.532 .640
Respondent's Occupation Housewife® Agriculture/ Framing	.843	1.134	2.112	.340	1.910	.074	2.428*
Respondent's Income* 0® 1001-2000 More than 2000	1.711 1.002	.999 .962	4.018 1.902	8.772 1.072	.421 .647	1.026*** .997	.782 1.022
Respondents' Religion Islam® Hinduism	1.869	1.345	.662	.308	.419**	4.233	1.086

Significant at *.10, **.05, ***.01; Reference Category =®

Discussion

Women's uptake of maternal health care services remains strongly associated with wealth, and high financial costs are considered a major barrier in maternal health care utilization in the developing countries like Nepal, India, Bangladesh and Pakistan.^{3,4,20-22} After taking many interventions of these countries resulted remarkable success in achieving many maternal and child health related problems where pregnancy and delivery complications are the major reasons of the higher number of child and maternal morbidity as well as mortality. On the other hand, it has been estimated that the presence of skilled attendants at delivery could reduce maternal deaths by 13 to 33 percent.²³ Better access to quality maternal health care services for poor populations is one of the key challenges developing countries face in preventing maternal deaths and disabilities.^{14,24,25} Moreover, access barriers include transport costs, high service fees, long distances from the home to health facilities (HF), insufficient supplies of drugs or equipment at HFs, and poor provider training and treatment with patients are mostly related to lower

outcomes of maternal health status.^{25,26} It is also clearly mentioned that a number of important social and health system issues underlie the poor maternal health situation in Bangladesh because of common causes of maternal deaths include postpartum haemorrhage, eclampsia, and complications of abortion; obstructed labor, and postpartum sepsis.²⁷ The current study indicated that financial barriers are still playing a major role in receiving better maternal healthcare services among the rural women though Bangladesh has significantly developed the overall health status by the last few decays including child mortality. This study found that the rural women who received voucher scheme, they also received more maternal health care services related to antenatal, delivery and postnatal care services compare to the non-voucher scheme receivers. Maternal health voucher recipients received more information or treatment of RTIs and STIs in their antenatal period along with TT vaccination and blood screening for HIV; transport cost in their delivery period and also received required family planning methods.

After all, getting achievement in reducing maternal and child mortality, those then are still burdens of achieving the overall development in Bangladesh so that importantly special focus should take on maternal health, with investigation into the existing policies, strategies and interventions, which are expected to improve maternal outcomes mostly.²⁸ Although Bangladesh has achieved important health gains than many other African and Asian developing countries, equivalent progress has not been realized in the area of maternal health so that the maternal mortality ratio as an indicator of maternal health in Bangladesh remains unacceptably high. In many ways the existence of a high maternal mortality rate represents the failure of the health system to effectively respond to the needs of women in the country, yet it must also be seen as the end point in a life time experience of gender discrimination, neglect and deprivation for Bangladeshi women. From a health systems perspective, maternal mortality is an indicator not only of women's health but also of access, quality and effectiveness of the country's health sector. Between 2001 and 2010, care-seeking for delivery care from health facilities more than doubled, and improved across all socioeconomic groups. However, use of skilled birth attendants, which was almost entirely in health facilities, reached 32% overall, and was only 12% among the poorest socioeconomic quintile in 2011.²⁹ The study found that the number of maternal morbidity and mortality has decreased by increasing maternal health care services in Bangladesh with the proper utilization of family planning program, which is in the better position comparatively than other developing countries of the world. It is also noted that voucher scheme recipients received skilled birth attendance, institutional delivery services, safe home delivery related services and referral to a professional trained doctors if they faced any complications such as obstructed labor etc compare to the non voucher scheme recipients.

Demand-side financing, popularly well-known as maternal health care voucher, is found as one of the effective factor to reduce the financial barriers, to increase choice for clients, and to improve efficiency in delivery and quality of services which ultimately enhances maternal health care.³⁰ Several factors have contributed to the increased use of health facilities and maternal health care-seeking, evident from the doubling in the proportion of deliveries by skilled personnel as well as the use of facilities for maternal complications seen in the study, and the estimated 59% increase in treatment-seeking for

abortion complications.³¹ Voucher scheme receivers were more facilitated in their antenatal, delivery and postnatal time than those received by non-voucher scheme receivers because they are advised, counseled and facilitated services to reduce malnutrition or healthcare barriers.³² On the contrary, education, income and occupation impacted the health status but voucher scheme removed many barriers of the poor women's maternal healthcare services they needed or need.³² So, it is clear that voucher scheme significantly changed the maternal health status where maternal mortality, child mortality and malnutrition, which were decreased by the maternal health voucher facilities.³² Pre-conception, antenatal, deliver, postnatal and child bearing period women faced many health related complications but still there is less opportunity to cover them immediately where institutional delivery proportion is low because of having less developed infrastructure in rural Bangladesh.^{33,34} By this study, it has found that not only the status of voucher scheme facilitated but also respondents' age, level of education, occupation, income, religion are significantly played a role to receive maternal healthcare services among the rural women in Bangladesh. It has also identified by this study that Bangladesh provided stronger evidence of voucher programs being able to target the poor and the study assessed the impact of demand-side financing strategy on increasing the use of maternal health services among low-income women.

Conclusion

The overall finding of this study revealed that women who did not receive maternal health vouchers received lower antenatal, delivery, and postnatal care services. But the situation has found difference among the health voucher scheme recipients. Women who received voucher scheme faced less number of barriers and complications in their maternity than those who did not receive voucher scheme. But it is also noted that delay in reimbursement or cash incentives is one of the major complaints against the voucher program in national level after all having a lot of better outcomes in the overall health sector in Bangladesh. For this reason, it is recommended that on time delivery of the money/cheque can solve the problem. So, the mastermind of the program; especially the government and the financing group of the program must concentrate their efforts to solve the problem to make the voucher program smoother, effective and increase popularity. Finally, an effective monitoring system should be included getting overall developed health status in Bangladesh.

Declarations

Ethics approval and consent to participate

The study was approved by Department of Population Sciences, University of Dhaka, Bangladesh. On the other hand, local leaders in each of the sub-districts were also invited to review and approve the study. Prior to data collection, informed consent was obtained for all potential study participants. Only the research team had accessed to the study data.

Consent for publication

Not Applicable

Availability of data and material

The complete data and materials are not available publicly due to the under preparation of the other articles/ manuscripts; but after completion the work, they will be available soon.

Competing interests

The authors declared that there is no conflict of interests.

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Authors' contributions

Analyses and the first draft of the manuscript were prepared by ACD. ACD and MN also edited all subsequent drafts and prepared the final version.

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Authors' information (optional)

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