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Factors Influencing the Utilization of Antenatal Care, Institutional Delivery, and Postnatal Care Services Among Women in Bangladesh

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Abstract

Background: In Bangladesh, the utilization of maternal health services is low, which triggers pregnancy-related complications and maternal deaths. The current community-based cross-sectional study aims to evaluate the factors associated with antenatal care (ANC), institutional delivery, and postnatal care (PNC) service utilization among women in selected areas of Southwest Dhaka, Bangladesh.

Methods: The study was carried out among 391 mothers from rural and urban areas. Data were collected using a standard questionnaire. Univariate and multivariate analyses were performed to identify the significant determinants associated with maternity care service utilization.

Results: Result shows that approximately 65%, 71%, and 72% of women utilized the recommended ANC, institutional delivery, and PNC, respectively. The utilization of ANC was associated with residence type and women's education, whereas the utilization of institutional delivery and PNC was associated with residence type, women's education, husband's education and employment status, family size, monthly family income, and received ANC. The use of ANC and healthy delivery facilities is another important predictor of PNC service utilization.

Conclusions: Considering these findings, improved maternal health services, increased availability and affordability of services, counseling, and education during pregnancy are advocated throughout the country.

Keywords: antenatal care, Bangladesh, institutional delivery, maternal health, postnatal care

INTRODUCTION

Over the last two decades, maternal mortality is significantly reduced globally, although the ratio is still high in many low and middle-income countries (LMICs). In developing countries, approximately 5,500 women died because of maternal consequences in 2015 in Bangladesh.[1] In addition, Bangladesh's neonatal mortality rate reaches 23 deaths per 1,000 live births because of the lack of maternity care.[2] In Bangladesh, the utilization of maternal health services (MHS) is low, which triggers pregnancy-related complications and maternal deaths.[3] The government of Bangladesh sets a target to reduce maternal mortality by 176 to 105 per 10,000 live births by 2021 following Sustainable Development Goals (SDGs), which are focused on reducing maternal deaths by 70 per 10,000 deaths by 2030 globally.[4,5]

Antenatal care (ANC), delivery place, and postnatal care (PNC) are the important determinants of maternal and neonatal health, and ANC is an important predictor of the utilization of institutional delivery and PNC from medically provided trainers after delivery, which are important for the health of mothers and infants.[6] According to World Health Organization (WHO), at least four ANC visits should be taken to reduce pregnancy-related complications.[7] However, the utilization of ANC depends on the availability, affordability, quality of services, and cultural beliefs.[8,9] Given the lack of optimum ANC, several maternal complications, low birth, and preterm birth occur.[10] Maternity care defines taking care of mother health during pregnancy, child births, and postpartum period.[11] In Bangladesh, several studies have been conducted on the utilization of ANC and their associated factors.

Delivery place is another determinant that can reduce the maternal deaths and improve the health of mothers and infants. More than 70% of all births occurred at home were reported in a secondary analysis of 48 LMICs.[12] In Bangladesh, almost 71% of total births have occurred at home, and only one out of five women is attended by a medically trained provider.[13] The percentage of poor delivery care is high, as traditional/conventional birth attendants (TBAs) are easily available and affordable, although their services

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are not effective and safe.[14] Poverty, illiteracy, and type of residence are important factors for the utilization of poor MHS. Many studies reported that 62% of maternal deaths during the postpartum period were due to unhygienic delivery place and inappropriate utilization of PNC.[15] PNC is a service provided to mother and infants within six weeks of delivery, which is crucial for the survival of the mother and child.[16] Based on WHO recommendations, mothers and newborns should receive PNC care within the first 24 h of delivery, and a minimum of three additional PNC visits are recommended.[17] PNC care after delivery is necessary for monitoring danger signs of newborns, initial breastfeeding, and counseling of mothers about the necessity of exclusive breastfeeding, healthy nutrition and lifestyle practices, etc.[18]

In Bangladesh, the utilization of healthy delivery care and PNC for mothers and neonates is associated with residential type, educational, and occupational status of mothers and husband, previous experience of receiving healthy delivery care, PNC, and availability of mass media at the household level.[19,20] The utilization of proper ANC is a crucial predictor of using healthy delivery care and PNC.[21] However, knowledge regarding pregnancy-related complications among mothers is lacking, and existing knowledge is basically established from family traditions and culture related to the use of healthy maternal care services in this country.[19]

The utilization of health care services is a complex behavioral phenomenon, as it is related to availability, costs of services, social structure, and religious and personal beliefs. The availability and utilization of health care services are increasing in the selected areas after becoming a new part of South Dhaka City Corporation in 2016. To our best knowledge, no study has focused on this phenomenon in the southwest part of Dhaka City in Bangladesh. Thus, data about ANC, institutional delivery care, and PNC are lacking. Therefore, the present study aims to provide information about the factors associated with the use of health facilities during and after pregnancy, which includes ANC, institutional delivery, and PNC utilization in this part of the country.

METHODS

Ethical approval

This research is in accordance with the Helsinki Declaration, outlining the principles for research involving human subjects. The study was approved by the ethics board of Noakhali Science and Technology University. A consent form was taken, and the objectives, pros, and cons of the study were discussed with the participants.

Study design and sampling

The study was a community-based cross-sectional study carried out during April–July 2020, and it was primarily conducted in the southwest part of Dhaka City, Bangladesh. The study covered urban and rural people in the selected areas to compare the utilization of health facilities before, during, and after pregnancy.

Women who had children less than 59 months old were selected for the study. Women who refused to participate, had children aged >59 months, and physically ill were excluded from the study. A total of 391 data were collected conveniently from those who agreed to participate in this research. The sample size calculation was measured by using the Cochrane formulas: $n = Z^2PQ/d^2$,[22] where n is the smallest sample size to be achieved; p is the expected prevalence using at least ANC from a medically trained provider =0.82;[23] q is the proportion of not using ANC from a medical provider =0.18; d is the marginal error =0.05; Z is the statistic for a confidence level of 95% = 1.96.

Therefore, N = [(1.96)2*0.82*0.18/(0.05)2] = 227. Adding 10% non-response rate, the sample size reached 250. However, 391 data from different households were collected.

Data collection

Participants were interviewed face to face using a pre-tested and standard questionnaire. Data about antenatal visits, institutional delivery, and PNC services of last pregnancy were collected from the participants. The questionnaire also consisted of the demographic profile of respondents, pregnancy complications, follow-up of antenatal and PNC, and others. In this study, the independent variables included demographic variables, mode of delivery, follow-up of ANC, and PNC. The number of ANC and PNC visits and place of delivery were selected as dependent variables.

Data analysis

Data were cleaned, re-coded, and analyzed using Statistical Package for Social Sciences Version 23.0. Descriptive statistics of continuous variables were presented as means with standard deviation or frequency/percentage, depending on the distribution of variables. Categorical variables were presented as distribution (frequency and percentage). Binary logistic regression analysis was performed to determine independent association. Crude and adjusted odds ratios were calculated by using univariate and multivariate analyses to determine the strength of the association of the independent variables with the outcome variable at a 95% confidence interval.

RESULTS

This paper indicates associated factors of ANC, healthy delivery, and PNC. The mean age of respondents was 25.19 ± 4.79. The majority of women were Muslim (91.8%) and had finished college or higher education (70.8%), whereas only 27.4% of women engaged themselves in income-generating activities. Most women (97.4%) received ANC from health institutions, and among these women, two-third received four or more ANC visits. Only 28.6% of women had delivery at home environment and 35.8% of women delivered their child through cesarean section. Receiving PNC after delivery among women was quite satisfactory (71.6%), and 31.7% did not do their follow-up PNC (Table 1).

The type of living place, religion, and women's and husband's education had a significant effect on antennal, delivery, and PNC. The percentage of receiving ANC, delivery care at health facilities, and PNC were high among urban women. Women who finished primary education had lower percentage of receiving health facility delivery care and PNC in contrast to highly educated women, and the results were similar to the case of husband's education. The chance of receiving PNC and healthy delivery care increased if the family income was more than 20,000 Taka in Bangladeshi currency. Furthermore, antenatal care had a significant effect on delivery care and PNC (Table 2).

Based on the result, urban women had more than nine times the odds to receive ANC and more than three times the odds to receive PNC compared with rural women. Women living in urban areas utilized ANC, healthy delivery, and PNC more than those living in rural areas. Women having family income more than 20,000 Taka had two times (OR: 2.39, 95%CI: 0.818–7.042) more chance of receiving PNC. Women receiving ANC from health facilities had better chance of receiving PNC (OR: 6.215, 95%CI: 1.57–24.48), and those who selected health institution for delivery had almost two times (OR: 1.934, 95%CI: 1.21–3.09) more chance of receiving PNC (Table 3).

TABLE 1. Characteristics of respondents (N = 391)

Background characteristics	N (%)	Background characteristics	N (%)
Women age[a]	25.19 ± 4.79	**Women body mass index**[a]	25.03 ± 9.99
Residence		**Husband's education**	
Rural	194 (49.6)	Primary level	36 (9.2)
Urban	197 (50.4)	Secondary level	53 (13.6)
Religion		College or higher	302 (77.2)
Islam	359 (91.8)	**Husband's occupation**	
Hindus	31 (7.9)	Unemployment	50 (12.8)
Christian	1 (0.3)	Employment	341 (87.2)
Marital Status		**Family type**	
Married	389 (99.5)	Nuclear	87 (22.3)
Divorced	2 (0.5)	Extended	304 (77.7)
Women's education		**Family size**	
Primary level	53 (13.6)	4 or less	53 (13.6)
Secondary level	61 (15.6)	5 or more	338 (86.4)
College or higher	277 (70.8)	**Monthly income (BDT)**	
Women's occupation		<10,000	24 (6.1)
Unemployment	284 (72.6)	10,000–20,000	171 (43.7)
Employment	107 (27.4)	>20,000	196 (50.1)
Received antenatal care		**Mode of delivery**	
Yes	381 (97.4)	Normal/vaginal	251 (64.2)
No	10 (2.6)	Cesarean	140 (35.8)
No of antenatal visit		**Received postnatal care**	
Once	38 (9.7)	Yes	280 (71.6)
2–3 times	87 (22.3)	No	111(28.4)
≥4 times	256 (65.5)	**Follow-up of postnatal care**	
Delivery care		Yes	267 (68.3)
Home delivery	112 (28.6)	No	124 (31.7)
Health institution	279 (71.4)		

[a]Continuous variables are presented as mean ± SD.

TABLE 2. Relation of maternity care with background characteristics of women

Characteristics	Received antenatal care			Received delivery care			Received postnatal care		
	Yes	No	*p*	Home delivery	Institutional delivery	*p*	Yes	No	*p*
	N (%)	N (%)		N (%)	N (%)		N (%)	N (%)	
Residence									
Rural	105 (27.5)	9 (90.0)	<0.05	107 (95.5)	7 (2.5)	<0.05	54 (22.5)	60 (39.7)	<0.05
Urban	276 (72.5)	1 (10.0)		5 (4.5)	272 (97.5)		186 (77.5)	91 (60.3)	
Religion									
Islam	351 (92.1)	8 (80.0)	NS	93 (83.0)	266 (95.3)	<0.05	263 (93.9)	96 (86.5)	<0.05
Hindus	29 (7.6)	2 (20.0)		18 (16.1)	13 (4.7)		17 (6.1)	14 (12.6)	
Christian	1 (0.3)	0 (0.0)		1 (0.9)	0 (0.0)		0 (0.0)	1 (0.9)	
Marital status									
Married	379 (99.5)	10 (100.0)	NS	112 (100.0)	277 (99.3)	NS	280 (100.0)	109 (98.2)	<0.05
Divorced	2 (0.5)	0 (0.0)		0 (0.0)	2 (0.7)		0 (0.0)	2 (1.8)	
Women education									
Primary level	49 (12.9)	4 (40.0)	<0.05	24 (21.4)	29 (10.4)	<0.05	33 (11.8)	20 (18.0)	<0.05
Secondary level	57 (15.0)	4 (40.0)		25 (22.3)	36 (12.9)		31 (11.1)	30 (27.0)	
College or higher	275 (72.1)	2 (20.0)		63 (56.3)	214 (76.7)		216 (77.1)	61 (55.0)	
Women occupation									
Unemployment	278 (73.0)	6 (60.0)	NS	74 (66.1)	210 (75.3)	NS	200 (71.4)	84 (75.7)	NS
Employment	103 (27.0)	4 (40.0)		38 (33.9)	69 (24.7)		80 (28.6)	27 (24.3)	
Husband education									
Primary level	33 (8.7)	3 (30.0)	NS	11 (9.8)	25 (9.0)	<0.05	12 (4.3)	24 (21.6)	<0.05
Secondary level	52 (13.6)	1 (10.0)		31 (27.7)	22 (7.9)		25 (8.9)	28 (25.2)	
College or higher	296 (77.7)	6 (60.0)		70 (62.5)	232 (83.2)		243 (86.8)	59 (53.2)	
Husband occupation									
Unemployment	48 (12.6)	2 (20.0)	NS	28 (25.0)	22 (7.9)	<0.05	29 (10.4)	21 (18.9)	<0.05
Employment	333 (87.4)	8 (80.0)		84 (75.0)	257 (92.1)		251 (89.6)	90 (81.1)	
Family size									
4 or less	52 (13.6)	1 (10.0)	NS	34 (30.4)	19 (6.8)	<0.05	33 (11.8)	20 (18.0)	NS
5 or more	329 (86.4)	9 (90.0)		78 (69.6)	260 (93.2)		247 (88.2)	91 (82.0)	
Monthly income (BDT)									
<10,000	24 (6.3)	0 (0.0)	NS	10 (8.9)	14 (5.0)	<0.05	11 (3.9)	13 (11.7)	<0.05
10,000–20,000	167 (43.8)	4 (40.0)		39 (34.8)	132 (47.3)		123 (43.9)	48 (43.3)	
>20,000	190 (49.9)	6 (60.0)		63 (56.3)	133 (47.7)		146 (52.1)	50 (45.0)	
Place of receiving ANC									
Health facilities				104 (92.9)	277 (99.3)	<0.05	277 (98.9)	104 (93.7)	<0.05
Not health facilities				8 (7.1)	2 (0.7)		3 (1.1)	7 (6.3)	
Delivery care									
Home delivery							69 (24.6)	43 (38.7)	<0.05
Health institution							211 (75.4)	68 (61.3)	

p-value derived from chi-square statistics at 5% level of significance ($p < 0.05$), NS; Not significant.

DISCUSSION

This paper demonstrates substantially lower utilization of health facilities delivery and PNC, although the utilization of ANC among women is increased. The study results reported that receiving ANC, healthy facility delivery care, and PNC are associated with the type of residence, women's education, husband's education and employment, family size, and monthly income of family. As health facility service and social environment are different in rural and urban areas, different proportions of ANC utilization, healthy delivery care, and PNC are expected.[24] In our study, a high proportion of less ANC utilization, healthy delivery care, and PNC among rural women were found, which may be due to low level of education, less availability of healthy facility service, and environment of society and communication. More than one-fourth of women in our study had no college or higher education, which may be due to poverty and early marriage. Women with higher education level may understand the necessity of receiving ANC, healthy delivery care, and PNC, which was consistent with our present study.[25,26]

Compared with national data, facilities available for deliveries were found at a better condition in this study. More than half of the women received PNC in this study, and the percentage was higher among those who received healthy delivery facilities, which corresponds to BDHS survey 2017–18.[23]

TABLE 3. Factors associated with maternity care and delivery care utilization

Characteristics	Received antenatal care		Received delivery care		Received postnatal care	
	Univariate OR (95%CI)	Multivariate OR (95%CI)	Univariate OR (95%CI)	Multivariate OR (95%CI)	Univariate OR (95%CI)	Multivariate OR (95%CI)
Residence						
Rural	1	1	1	1	1	1
Urban	9.5 (1.19–75.91)*	11.4 (1.21–107.08)*	5.96 (3.22–11.04)*	2.25 (1.10–4.60)*	3.73 (2.31–6.00)*	3.6 (1.86–6.94)*
Women education						
Primary level	1	1	1	1	1	1
Secondary level	11.2 (2.00–62.95)*	8.8 (1.29–60.24)*	3.5 (1.93–6.54)*	3.8 (1.57–9.15)*	2.14 (1.15–4.00)*	0.84 (0.36–1.94)
College or higher	9.6 (1.72–53.94)*	14.7 (2.20–97.97)*	4.2 (2.37–7.59)*	4.5 (1.95–10.65)	3.43 (1.92–6.10)*	2.78 (1.43–5.42)*
Husband education						
Primary level			1	1	1	1
Secondary level			2.1 (1.17–3.90)*	0.63 (0.27–1.44)	4.6 (2.51–8.48)*	3.85 (1.80–8.22)*
College or higher			6.8 (3.21–14.60)	3.49 (1.25–9.66)*	8.2 (3.89–17.42)*	8.27 (3.12–21.80)*
Husband occupation						
Unemployment			1	1	1	1
Employment			2.6 (1.39–4.70)*	1.10 (0.49–2.45)	2.02 (1.09–3.72)*	4.4 (1.90–9.80)*
Family size						
4 or less			1	1		
5 or more			5.96 (3.22–11.04)*	2.25 (1.10–4.60)*		
Monthly income (BDT)						
<10,000			1	1	1	1
10,000–20,000			1.60 (1.00–2.55)*	1.01 (0.54–1.89)	1.14 (0.71–1.81)	1.73 (1.00–2.97)*
>20.000			0.66 (0.27–1.57)	0.81 (0.24–2.62)	3.45 (1.45–8.19)*	2.39 (0.81–7.04)
Place of receiving ANC						
Not health facilities			1	1	1	1
Health facilities			1.9 (1.20–4.49)*	1.5 (0.97–2.93)	6.22 (1.57–24.48)*	3.71 (0.78–17.69)
Delivery care						
Home delivery					1	1
Health institution					1.93 (1.21–3.09)*	0.81 (0.42–1.55)

*p <0.05

In this study, a significant variation in the utilization of maternity care was observed between husband's education and occupation. Several studies indicated that partner's education and employment status were associated with the proper utilization of maternal health care.[26–28]

Logistic regression revealed that the type of residence is another important factor for receiving maternal health care services. In addition, family status, educational level, and economic condition were found to be the main determinants for less utilization of maternal care among rural women. Urban women received healthier facilities because of the availability and affordability of services compared with rural areas. Some studies also showed identical results between the two factors.[27,28]

The present study also revealed that ANC was not significantly associated with the income status of the family. This finding was inconsistent with that of Kamal *et al*.[26] However, the utilization of institutional delivery service and PNC showed significant correlation. Logistic regression analysis after adjusting for variables showed that only PNC service utilization was significantly associated with economic status, but these findings were contrary to the result of Kamal *et al*.[26] and Chowdhury *et al*.[29] where utilization of home delivery care from untrained TBA was significantly associated with the wealth index of family and utilization of medically facilitated place for delivery. Furthermore, PNC were associated with the wealth index.

There are great chances of receiving institutional delivery and PNC if women received ANC during pregnancy. These results were significantly associated with each other. Some studies showed similar results to this study.[27,30] Postnatal check-up was also associated with the place of delivery, which was similar to the result of Neupane *et al.*[28,30] This study highlighted the predictors associated with the utilization of healthy maternal services and indicated that more programs and research projects focusing on increasing the proper utilization of ANC, institutional delivery, and PNC services in rural and urban Bangladeshi women should be developed to meet SDGs.

This study has a number of limitations. The data were self-reported, and the study is cross-sectional, which does not conclude causal relationships.

CONCLUSIONS

The study revealed that the utilization of ANC, institutional delivery, and postnatal services increased in 2020 compared with the national data of 2018, whereas the risk of maternal and child mortality reduced. It also provided comprehensive understanding of the possible reasons for the utilization of healthy maternal care services and their associated factors. Therefore, increased availability and affordability of services as well as counseling and education during pregnancy were suggested throughout the country with the policy makers and government to achieve the WHO recommended number of ANC and PNC and the goals of SDG improvement of MHS.

CONFLICT OF INTEREST

None.

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REFERENCES

1. Bongaarts J. WHO, UNICEF, UNFPA, World Bank Group, and United Nations Population Division trends in maternal mortality: 1990 to 2015 Geneva: World Health Organization, 2015. *Popul Dev Rev*. 2016;42:726.
2. Lawn J, Kinney M, Blencowe H, The Lancet Every Newborn Study Group, Coghlan N, Farber J. *Every newborn: An executive summary for The Lancet's Series*. United Kingdom: The Lancet, 2014.
3. Sultana M, Mahumud RA, Ali N, Ahmed S, Islam Z, Khan JA, *et al*. The effectiveness of introducing Group Prenatal Care (GPC) in selected health facilities in a district of Bangladesh: Study protocol. *BMC Pregnancy Childbirth*. 2017;17:48.
4. Alkema L, Chou D, Hogan D, Zhang S, Moller AB, Gemmill A, *et al*. Global, regional, and national levels and trends in maternal mortality between 1990 and 2015, with scenario-based projections to 2030: A systematic analysis by the UN Maternal Mortality Estimation Inter-Agency Group. *Lancet*. 2016;387:462–74.
5. Ministry of Health and Family Welfare. *Health Bulletin 2016*. Dhaka: Ministry of Health and Family Welfare, 2016.
6. Abou Zahr C, Wardlaw TM, World Health Organization, UNICEF. *Antenatal care in developing countries: Promises, achievements and missed opportunities-an analysis of trends, levels and differentials, 1990-2001*. Geneva: World Health Organization; 2003.
7. World Health Organization. *WHO recommended interventions for improving maternal and newborn health: Integrated management of pregnancy and childbirth*. Geneva: World Health Organization, 2007.
8. Chakraborty N, Islam MA, Chowdhury RI, Bari W. Utilisation of postnatal care in Bangladesh: evidence from a longitudinal study. *Health Soc Care Community*. 2002;10:492–502.

9. Kabir M, Iliyasu Z, Abubakar IS, Asani A. Determinants of utilization of antenatal care services in Kumbotso Village, northern Nigeria. *Trop Doct*. 2005;35110–1.
10. Tuladhar H, Dhakal N. Impact of antenatal care on maternal and perinatal utcome: A study at Nepal medical college teaching hospital. *Nepal J Obstet Gynecol*. 2011;6:37–43.
11. World Health Organization. *Maternal mortality in 2005: Estimates developed by WHO, UNICEF, UNFPA, and the World Bank*. Geneva: World Health Organization, 2007.
12. Finlayson K, Downe S. Why do women not use antenatal services in low- and middle-income countries? A meta-synthesis of qualitative studies. *PLoS Med*. 2013;10:e1001373.
13. Prata N, Bell S, Quaiyum MA. Modeling maternal mortality in Bangladesh: The role of misoprostol in postpartum hemorrhage prevention. *BMC Pregnancy Childbirth*. 2014;14:78.
14. Sibley LM, Sipe TA, Barry D. Traditional birth attendant training for improving health behaviours and pregnancy outcomes. *Cochrane Database Syst Rev*. 2012;8:CD005460.
15. Workineh YG, Hailu DA. Factors affecting utilization of postnatal care service in Amhara region, Jabitena district, Ethiopia. *Sci J Public Health*. 2014;2:169–76.
16. World Health Organization. *Trends in maternal mortality: 1990-2015: Estimates by WHO, UNICEF, UNFPA, World Bank Group and the United Nations Population Division*. Geneva: World Health Organization, 2015.
17. World Health Organization. W*HO recommendations on postnatal care of the mother and newborn*. Geneva: World Health Organization, 2014.
18. World Health Organization. *WHO technical consultation on postpartum and postnatal care*. Geneva: World Health Organization, 2010.
19. Biswas A, Dalal K, Abdullah AS, Gifford M, Halim MA. Maternal complications in a geographically challenging and hard to reach district of Bangladesh: A qualitative study. F1000Res. 2016;5:2417.
20. Nasrin M, Sarker MNI, Huda N. Determinants of health care seeking behavior of pregnant slums dwellers in Bangladesh. *Med Sci*. 2019;23:35–41.
21. Islam N, Islam MT, Yoshimura Y. Practices and determinants of delivery by skilled birth attendants in Bangladesh. *Reprod Health*. 2014;11:86.
22. William GC. *Sampling techniques*. Canada: John Willey & Sons Inc.; 1977.
23. National Institute of Population Research and Training (NIPORT). *Bangladesh demographic and health survey 2017-18*. Dhaka: NIPORT; 2020.
24. Bell JS, Curtis SL, Alayón S. *Trends in delivery care in six countries*. DHS Analytical Studies No. 7. Calverton, Maryland, USA: ORC Macro; 2003.
25. Mekonnen Y, Mekonnen A. Factors influencing the use of maternal healthcare services in Ethiopia. *J Health Popul Nutr*. 2003;21:374–82.
26. Kamal SMM. Factors affecting utilization of skilled maternity care services among married adolescents in Bangladesh. *Asian Popul Stud*. 2009;5:153–70.
27. Kabir MR, Ghosh S, Al Mamun MA, Islam H, Ghani RBA. Factors associated with antenatal and health facility delivery care in selected areas of Subornochor upazila, Noakhali, Bangladesh. *Clin Epidemiol Glob Health*. 2020;8:983–8.
28. Neupane S, Doku D. Utilization of postnatal care among Nepalese women. *Matern Child Health J*. 2013;17:1922–30.
29. Chowdhury MAH, Hasan MM, Ahmed S, Darwin C, Hasan MS, Haque MR. Socio-demographic factors associated with home delivery assisted by untrained traditional birth attendant in rural Bangladesh. *Am J Public Health Res*. 2013;1:226–30.
30. Kanté AM, Chung CE, Larsen AM, Exavery A, Tani K, Phillips JF. Factors associated with compliance with the recommended frequency of postnatal care services in three rural districts of Tanzania. *BMC Pregnancy Childbirth*. 2015;15:341.