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Factors associated with the utilization of reproductive health services among the Bangladeshi married women: Analysis of national representative MICS 2019 data

Md. Sabbir Ahmed [a,*], Safayet Khan [b], Fakir Md Yunus [c]

[a] Department of Community Health and Hygiene, Faculty of Nutrition and Food Science, Patuakhali Science and Technology University, Dumki, Patuakhali 8602, Bangladesh
[b] BRAC Institute of Educational Development, BRAC University, House 113/A, Road 2, Niketan, Gulshan 1, Dhaka 1212, Bangladesh
[c] Department of Psychology and Neuroscience, Dalhousie University, 1355 Oxford Street, Halifax NS B3H 4R2, Nova Scotia, Canada

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ABSTRACT

Objectives: We calculated the prevalence of reproductive health services utilization among the currently married non-pregnant women in Bangladesh and investigated its association with demographics and socio-economic factors.

Methods: Publicly available secondary country representative 2019 Multiple Indicator Cluster Survey (MICS) dataset was analyzed. A two-stage stratified random sampling technique was followed, and all administrative districts (N=64) of Bangladesh were covered in the MICS 2019. Contraceptive use, antenatal care and skilled birth attendant were considered as utilization of reproductive health services and both crude and adjusted Odd Ratio (OR) were reported using a total of 8917 (weighted) data.

Results: In Bangladesh, 36.9% of married non-pregnant women utilized all three reproductive health services. However, at disaggregated level, contraceptive use (66.9%), antenatal care (83%) and skilled birth attendant (59.3%) were found 2-3 folds higher then cumulative prevalence. Increased likelihood of utilization of reproductive health services (either combined or at individual services) was observed among those women who had higher education [AOR= 2.63, 95% CI 1.99 to 3.47], belong to wealthy families [AOR= 2.46, 95% CI 1.94 to 3.12], residing in urban areas [AOR= 1.33, 95% CI 1.14 to 1.54], having a smaller number of children [AOR= 1.53, 95% CI 1.25 to 1.87], and exposure to media [AOR= 1.44, 95% CI 1.26 to 1.63].

Conclusion: Around one-third of Bangladeshi married women received combined contraceptive use, antenatal care and skilled birth attendant reproductive health services; however, variation exist at the individual service level. Targeted public health campaign focusing on women education and media advertisement may increase the utilization.

Introduction

World Health Organization (WHO) stated *'reproductive health is a state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity, in all matters relating to the reproductive system and to its functions and process'* (World Health Organization, 2020). Ensuring universal access to sexual and reproductive health care services and reproductive rights are also a significant agenda for achieving Sustainable Development Goals (SDGs) 3 and 5 (United Nations, 2020). Utilization of reproductive health services not only helps to reduce maternal mortality but also protects maternal and child health and wellbeing (Thapa, 2020). Although global maternal mortality ratio (MMR) has been dropped by 38% from 2000 to 2017 (World Health Organization, 2019), it remains a serious health concern for women (Dennis, 2016). Bangladesh has made substantial improvements in reducing MMR during the past decades (El Arifeen et al., 2014). However, the MMR is still very high (172 as of 2017), and Bangladesh is far from achieving SDG target (i.e., 70) (Director General of Health Service, 2020).

Use of contraception, antenatal care (ANC) service during pregnancy, and skilled birth attendant (SBA) are the key components of reproductive health service for women to avoid unwanted/unplanned pregnancies, reduce maternal mortality, and to protect maternal and child health (Olakunde et al., 2019; Siddique et al., 2018; Thapa, 2020; Tsui et al., 2010). It is estimated that every year, worldwide about 210 million women become pregnant (Adhikari, 2009). During 2010-

* Corresponding author.
E-mail addresses: sabbir.nfs@gmail.com (Md.S. Ahmed), safayet.khan@bracu.ac.bd (S. Khan), fakir.yunus@dal.ca (F.M. Yunus).

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2014, worldwide 44% of the pregnancy were unintended/unplanned (Bearak et al., 2018) and within this period, 55.7 million abortions occurred worldwide, of which 25.1 million abortions were unsafe (Ganatra et al., 2017). Using contraception can protect women from these preventable causes of maternal mortality and morbidity (Hossain et al., 2018; Tsui et al., 2010). ANC is a broad aspect of medical procedures and care provided to the women during pregnancy, and significant to maintain a healthy pregnancy state and ensure safe childbirth (Ekabua et al., 2011). Evidence showed that low utilization of prenatal health services could adversely affect birth outcomes (Chanda et al., 2020). ANC is one of the most effective interventions to protect maternal and child health and if implemented properly, it can reduce maternal and perinatal mortalities (Bilenko et al., 2007; Fotso et al., 2009; Oladapo and Osiberu, 2009). The concept of utilization of SBA is mainly based on the conceptual framework of health-seeking behavior by Andersen and Newman, which is very crucial in protecting maternal health and safe childbirth (Andersen and Newman, 1973; Dickson and Amu, 2017; Kibria et al., 2017). Every year globally, about 60 million births occur outside of health care facilities, and the majority of them are without SBA (Ljungblad et al., 2019). As a result, worldwide about 289,000 maternal deaths occur annually due to unskilled/poor standard of birth attendant (Cheelo et al., 2016).

Previous studies based on the Bangladesh Demography and Health Survey (BDHS) 2014 data reported about 62.4% of Bangladeshi married women or their husbands were using contraception, 78.4% of pregnant women had ANC contacts (at least one), and 35.9% of deliveries were attendant by SBA (Chanda et al., 2020; Hossain et al., 2018; Kibria et al., 2017). Several demographic and socio-economic factors have been identified as a predictor of reproductive health service seeking behavior of Bangladeshi married women (Chanda et al., 2020; Hossain et al., 2018; Kibria et al., 2017). A study conducted among the Nepalese young women reported that 21% of them use modern contraception, 71% attended at least four ANC, and 67% utilize SBA at delivery (Thapa, 2020). Another study conducted among the Ethiopian married women reported 87.6% of them attended at least on ANC, and 62.6% of deliveries were assisted by SBA (Dutamo et al., 2015). However, recent data on demographic and socio-economic factors associated with reproductive health services are lacking in Bangladesh. Being a lower middle-income country with dense population, higher maternal mortality rate is one of the leading public health concerns for Bangladesh (Mahmudur Rahman, 2018). Increasing the availability and ensuring the utilization of reproductive health services are crucial for reducing maternal mortality and protecting maternal and child health and wellbeing. Understanding the current situation and further identification of factors associated with the utilization of reproductive health care services among married women is critical to design evidence-based interventions and mobilize resources. Considering the importance of reproductive health services in protecting maternal and child health, we assessed the reproductive health service seeking behavior and identified the associated factors among the currently married non-pregnant Bangladeshi women, using a nationwide publicly available survey data.

Method

Data source

Our present study is based on the secondary dataset from the latest Multiple Indicator Cluster Survey (MICS) 2019 (Bangladesh Bureau of Statistics (BBS) and UNICEF Bangladesh., 2019). This nationwide cross-sectional survey was a part of six-round global MICS conducted by Bangladesh Bureau of Statistics (BBS) supported by UNICEF. This survey captured various health indicators and household characteristics. Data were collected from January to June 2019. MICS used a two-stage stratified random sampling procedure to collect data at the household level from 64 administrative districts of Bangladesh. The urban-rural areas within each district were considered as the sampling strata. Within each stratum, a specific number of census enumeration areas (EAs) were systematically selected with Probability Proportional to Size (PPS) sampling. After a listing of HHs within selected EAs, a systematic sample of 20 HH was drawn from each primary sampling unit (PSU). Total number of PSU and final sample size for this survey were 3220 and 64,400 respectively. Details of the sampling process, data collection procedure, and questionnaire are available in the final report of 2019 MICS (Bangladesh Bureau of Statistics (BBS) and UNICEF Bangladesh., 2019). In this study we used women data file. Women who had a live birth within the last two years preceding the survey were considered for this study. Dataset was cleaned (e.g., removing missing/incomplete cases) before conducting formal analysis. To comply with the objective of this study, we analyzed a total of 8917 (weighted) women's data who have provided information of all three dependent variables (stated below).

Dependent variables

Three reproductive health service indicators were considered as the outcome variables for this study; ***Contraception use:*** A Women was considered for using contraception, if she or her sexual partner is currently using at least one method of contraception to avoid pregnancy (Hossain et al., 2018). To calculate the prevalence of conceptive use, we used CP2 variable in the MICS dataset which was operationalize as *"Couples use various ways or methods to delay or avoid getting pregnant. Are you currently doing something or using any method to delay or avoid getting pregnant?"* Those who responded 'yes' to CP2 question were considered as the numerator and all married non-pregnant (at the time of data collection) who provided all three outcome variables (n=8917) data were considered as denominator in the calculation. ***Antenatal care visit:*** Women who received at least one antenatal care visit during her last pregnancy were considered here, regardless the type of service provider (Bangladesh Bureau of Statistics (BBS) and UNICEF Bangladesh., 2019). A binary variable was generated for the analysis (Yes = '1', No = '0'); ***Skilled birth attendant:*** Delivery assisted by any of the 'health care professional' was considered as Skilled Birth Attendant (SBA) (Bangladesh Bureau of Statistics (BBS) and UNICEF Bangladesh., 2019; World Health Organization, 2004). Women who received SBA were coded as '1', and who did not; coded as '0'.

Independent variables

The independent variables for this study were included: (1) age: women's age in years (categorized as 15-19, 20-24, 25-29, 30-34, 35-39,40-44 and 45-49 years); (2) education: highest educational level or grade attended (categorized as higher secondary+, secondary, primary and pre-primary or none); (3) wealth index quintile: computed by principal component analysis based on household assets and materials used to build house (categorized as richest, rich, middle, poor and poorest); (4) habitat: respondent's place of residence (categorized as urban and rural); (5) division: eight administrative divisional region in Bangladesh (categorized as Barishal, Chattogram, Dhaka, Khulna, Mymensingh, Rajshahi and Rangpur); (6) number of children: total children ever born (categorized as 1, 2 and 3+); (7) wanted last pregnancy: yes/no; (8) age of husband: age of the respondent's husband to whom she is currently married (categorized as $\leq$ 25, 26-39 and $\geq$ 40 years); (9) media exposure: respondent's exposure to television or newspaper or radio at least once in a week (yes/no).

Statistical analysis

Data were analyzed using Stata v14.2 (StataCorp, College Station, TX, USA) considering the complex sample design of the survey using *'svy'* command, and sampling weight was used to ensure the results at National level. Descriptive statistics were run to calculate the number and frequencies of the study variables. Pearson's Chi-square tests were performed to compare the reproductive health service seeking behaviors

(i.e., dependent variables) across different independent variables. To identify the factors associated with the utilization of reproductive health services, both univariate and multivariate logistic regression analysis was performed and estimated the unadjusted odd ratio (OR) and adjusted odd ratio (aOR) respectively with 95% CI. Variables found significant in bivariate analysis were adjusted in the multivariate regression model. All statistical tests were two-sided and considered significant at a 5% level of significance.

Ethics

The survey protocol of MICS was approved by the technical committee of the Government of Bangladesh lead by Bangladesh Bureau of Statistics (BBS). Participants gave their consent before data collection. All respondents were informed of the voluntary nature of participation and the confidentiality and anonymity of information. Additionally, respondents were informed of their right to refuse to answer all or particular questions, as well as to stop the interview at any time. Dataset are freely available at: https://mics.unicef.org/surveys, and we received authorization from the MICS team to use the dataset for analysis.

Result

Table 1 presents the distribution of reproductive health service utilization by socio-demographics of the study participants. They were grouped by the forms of access to the reproductive health services such as contraception, antenatal checkups, experienced delivery by skilled birth attendants, and those who experienced all three reproductive health services. Majority of them (31%) were aged between 20-24 years, half of the respondent were secondary level educated (20.2%), equal proportion of richest and poorest economic groups (21.2%), and mostly (78.1%) belongs to rural Bangladesh. Overall, about 66.9%, 83%, and 59.3% of Bangladeshi women used contraception, and received ANC, and SBA, respectively. However, only 36.9% of the women received all the three health services. Chi-square test revealed that lower proportion of contraceptive methods user was found in those who were from richest family (63.8%), living in rural areas (66%) and those who wanted their last pregnancy (65.8%). Younger age, higher education, higher wealthy status, urban residency, fewer children, awareness of wanted pregnancy, age of the husband (26-39 years), and exposure to media advertisements were significantly positively associated with those who accessed antenatal care, skilled birth attendants during pregnancy and those who had accessed all three reproductive health services.

Results of univariate binary logistics regression analysis are presented in Supplement Table 1. Multivariate binary logistic regression model suggests that higher educated women and women belongs to richest family have significantly higher odds of accessing antenatal care (aOR 3.88 and aOR 7.36), skilled birth attendants during pregnancy (aOR 3.88 and aOR 5.97) and those who had accessed all three reproductive health services (aOR 2.63 and aOR 2.46) respectively compared to those who had lowest education and fall under poorest wealth quantile (Table 2). Urban residents had significantly 1.4 times higher odds of using contraceptive methods compare to those live-in rural areas; however, participant's place of residence (urban/rural) have no influence on accessing antenatal care and skilled birth attendants during pregnancy. Higher likelihoods (aOR 1.91, 2.57 and 1.53) were observed in the adjusted model in those who with one child compare to those who had three or more children in the groups of women who accessed antenatal care, skilled birth attendants during pregnancy and those who had accessed all three reproductive health services, respectively. Exposure to media advertisements have significantly increased odds (1.4 folds) among all groups of participants than those who were not exposed. Based on administrative division of Bangladesh, women reside in Khulna division have 1.6, 2.6, and 2.5 times high likely to be used contraceptive methods, access antenatal care and skilled birth attendants during pregnancy compared to those live in Sylhet division in the adjusted model.

Discussion

In this study we investigated the prevalence and factors associated with the utilization of reproductive health services among the Bangladeshi women of reproductive age who provided a complete history of their reproductive health service utilization. We considered current contraceptive use, history of antenatal care and skilled birth attendant in this paper because it provides a comprehensive understanding of married non-pregnant women's reproductive health service utilization in Bangladesh. We found that a lower proportion of women are using different reproductive health services, meaning that a large segment of Bangladeshi women are at risk of unwanted/unplanned pregnancies, maternal mortality, and morbidity followed by a poor newborn health (Olakunde et al., 2019; Siddique et al., 2018; Thapa, 2020; Tsui et al., 2010).

Prevalence of using contraception was found 66.9%, which was slightly higher than an earlier study in Bangladesh (62.4%) based on 2014 BDHS data, indicating that Bangladesh has made little progress in 5 years (2014 to 2019) (Hossain et al., 2018). Although Bangladesh has made slight improvement in ensuring the maximum family planning coverage, the progression was not satisfactory. Comparing with other countries, prevalence of contraception use in Bangladesh was found higher than Malawi (30.9%) (Mandiwa et al., 2018), Nepal (40.2%) (Mahato et al., 2020), but lower than Kenya (75.0%) (Machiyama et al., 2018). We noted that women aged 45-49 years had the highest prevalence of contraceptive use in Bangladesh. Our findings are in line with a similar study carried out in Afghanistan which reported that likelihood of using contraceptive by the older aged women was higher compared to the younger women (< 20 yrs). The study further reported that contraception usage rate increase as the women reach their desired number of children (Osmani et al., 2015). A similar trend was also observed in Uganda (Asiimwe et al., 2014). Surprisingly, level of education among the women had no significant influence on the use of contraception among the Bangladeshi women, which was also supported by earlier study (Hossain et al., 2018). It did not find any rationale behind this stance; however, one possibility could be the existence of male dominance in the fabric of the Bangladeshi society (Ahmed and Yunus, 2020a). Furthermore, religious believe may overwrite the institutional educational foundation (Tigabu et al., 2018). Interestingly, we found that women from poor households were using contraception slightly higher than richest. This may because of the Government of Bangladesh (GoB) made contraceptives more accessible among the poor (Huda et al., 2017). Furthermore, our study showed a significant disparity in contraceptive use by habitat (urban vs. rural) and eight administrative divisions. For instance, women residing in urban areas and in Rangpur division were more likely to use contraceptive methods. Similar results were reported by Hossain et al., who reported that place of residence, and administrative division were significantly associated with contraception use in Bangladesh (Hossain et al., 2018). Variation in the socio-cultural and religious beliefs and practices between urban and rural areas as well as across different regions could be a possible reason for the observed disparities in contraceptive use (Hossain et al., 2018; Mandiwa et al., 2018). As expected, contraception use was higher among the women whose last pregnancy was unwanted.

Our results suggested that at least one antenatal care during the last pregnancy among women has increased almost by 10% from the period of 2014–19 (Chanda et al., 2020) which is similar to India (83.4%) (Ogbo et al., 2019), and higher than Nepal (74%) (Joshi et al., 2014). Likelihood of receiving ANC was relatively higher among the younger aged women, which is consistent with an earlier study conducted in Bangladesh (Rahman et al., 2017). As younger women are less experienced on child birthing issues, which may lead them to seek more prenatal care (Gupta et al., 2014). Maternal education also played a significant role in utilizing ANC services, higher the educational grade, higher the prevalence of receiving ANC. A similar trend was also observed in previous studies conducted in Bangladesh and Nepal (Joshi et al., 2014;

Table 1
Background characteristics of the study population and the status of reproductive health service utilization.

Characteristics	*N* (%)	Contraception Yes, n (%)	*p*	Antenatal care Yes, n (%)	*p*	Skilled birth attendant Yes, n (%)	*p*	All three Yes, n (%)	*p*
Overall	**8917 (100)**	**5967 (66.9)**		**7404 (83.0)**		**5289 (59.3)**		**3297 (36.9)**	
Age (years)									
15–19	1195 (13.4)	795 (66.4)	0.895	1051 (87.9)	< 0.001	743 (62.1)	< 0.001	467 (39.0)	< 0.001
20–24	2826 (31.7)	1894 (67.0)		2416 (85.4)		1776 (62.8)		1098 (38.8)	
25–29	2475 (27.8)	1652 (67.1)		2072 (83.6)		1472 (59.4)		919 (37.1)	
30–34	1582 (17.7)	1063 (68.0)		1271 (80.4)		907 (57.3)		571 (36.0)	
35–39	672 (7.5)	456 (68.0)		494 (73.7)		321 (47.7)		204 (30.2)	
40–44	131 (1.4)	81 (62.1)		78 (59.0)		56 (43.0)		29 (22.5)	
45–49	36 (0.5)	26 (74.1)		22 (62.1)		14 (39.1)		9 (25.0)	
Education									
Higher secondary +	1580 (17.7)	1048 (66.3)	0.950	1505 (95.2)	< 0.001	1342 (84.9)	< 0.001	867 (54.8)	< 0.001
Secondary	4471 (50.2)	2991 (66.9)		3915 (87.6)		2855 (63.8)		1774 (39.7)	
Primary	2067 (23.2)	1386 (67.0)		1527 (73.8)		844 (40.8)		518 (25.0)	
Pre-primary or none	799 (8.9)	542 (67.7)		457 (57.2)		248 (31.1)		138 (17.2)	
Wealth index									
Richest	1889 (21.2)	1206 (63.8)	< 0.001	1831 (96.8)	< 0.001	1626 (86.0)	< 0.001	1018 (53.8)	< 0.001
Rich	1771 (19.8)	1145 (64.6)		1617 (91.2)		1246 (70.3)		796 (44.8)	
Middle	1698 (19.2)	1127 (66.4)		1445 (85.2)		1009 (59.5)		612 (36.1)	
Poor	1674 (18.7)	1208 (72.1)		1281 (76.5)		795 (47.4)		504 (30.1)	
Poorest	1885 (21.1)	1281 (67.9)		1230 (65.2)		613 (32.5)		367 (19.5)	
Habitat									
Urban	1960 (21.9)	1372 (70.0)	0.004	1785 (91.1)	< 0.001	1450 (74.0)	< 0.001	971 (49.5)	< 0.001
Rural	6957 (78.1))	4595 (66.0)		5619 (80.7)		3839 (55.1)		2326 (33.4)	
Division									
Barishal	497 (5.5)	358 (71.9)	< 0.001	396 (79.6)	< 0.001	226 (45.6)	< 0.001	145 (29.2)	< 0.001
Chattogram	1913 (21.4)	1105 (57.7)		1593 (83.2)		1114 (58.2)		615 (32.1)	
Dhaka	2164 (24.3)	1435 (66.3)		1886 (87.2)		1439 (66.5)		891 (41.2)	
Khulna	903 (10.1)	652 (72.2)		834 (92.3)		697 (77.0)		477 (52.8)	
Mymenshing	687 (7.7)	486 (70.6)		481 (70.0)		253 (36.8)		157 (22.9)	
Rajshahi	1053 (11.9)	746 (70.9)		858 (81.5)		639 (60.7)		412 (39.1)	
Rangpur	975 (10.9)	739 (75.7)		814 (83.4)		564 (57.7)		398 (40.8)	
Sylhet	725 (8.2)	446 (61.3)		542 (74.5)		357 (49.3)		201 (27.5)	
Number of children (ever born)									
1	3039 (34.1)	2022 (66.5)	0.879	2727 (89.7)	< 0.001	2160 (71.0)	< 0.001	1341 (44.1)	< 0.001
2	3063 (34.3)	2052 (67.0)		2597 (84.8)		1827 (59.6)		1149 (37.5)	
3 +	2815 (31.6)	1892 (67.2)		2080 (73.8)		1302 (46.2)		807 (28.6)	
Wanted last pregnancy									
Yes	6688 (75.0)	4402 (65.8)	< 0.001	5654 (84.5)	< 0.001	4108 (61.4)	< 0.001	2528 (37.8)	0.015
No	2229 (25.0)	1565 (70.2)		1750 (78.5)		1181 (53.0)		769 (34.5)	
Age of husband (years)									
≤ 25	1103 (12.4)	762 (69.1)	0.106	907 (82.2)	< 0.001	625 (56.6)	< 0.001	397 (36.0)	0.001
26–39	6123 (68.7)	4108 (67.0)		5178 (84.5)		3758 (61.3)		2347 (38.3)	
≥ 40	1691 (18.9)	1097 (64.8)		1319 (78.0)		906 (53.6)		553 (32.7)	
Media exposure									
Yes	4696 (52.6)	3185 (67.8)	0.080	4256 (90.6)	< 0.001	3366 (71.6)	< 0.001	2175 (46.3)	< 0.001
No	4221 (47.4)	2782 (65.9)		3148 (74.5)		1923 (45.5)		1122 (26.5)	

Rahman et al., 2017). Women with higher educational attainment may have better understanding on the importance of receiving ANC for a safe childbirth. Evidence showed that institutional education always play a vital role to health care seeking behavior (Musoke et al., 2015). Economic condition of household (i.e. wealth index) had highest impact on utilization of ANC among the Bangladeshi women, which was in line with previous studies (Chanda et al., 2020; Joshi et al., 2014; Rahman et al., 2017). Likelihood of receiving ANC among the women was also observed higher who were residing in Khulna division with single child. Women who were exposed to television or newspaper or radio at least once in a week had higher possibility of receiving ANC. This finding indicate special family planning interventions should be taken targeting to the pregnant women who have no access to media or no exposure to media. Television as an audio-visual media has a great appeal which enables viewers to understand information regardless of their level of literacy (Afroz et al., 2019). A recent study also indicated that, among the Bangladeshi households where television is non-existent, people might have less chance of receiving public health messages broadcasted through television (Ahmed and Yunus, 2020b).

Furthermore, we found that about 59.3% of the deliveries in Bangladesh handled by a skilled birth attendant, which was significantly higher than previous statistics (35.9%) (Kibria et al., 2017). Meaning that Bangladesh has made a substantial improvement in ensuring the availability and accessibility of midwifery services. Utilization of SBA among the Bangladeshi women was found higher than India (29.2%) (Ayele et al., 2019), and Afghanistan (53.6%) (Mumtaz et al., 2019), but lower than global statistics (65.7%) (WHO, 2008). Odd ratio of utilizing SBA positively increased with the educational and household wealth status of the Bangladeshi women. Similar to ANC, household wealth status played highest impact on the utilization of SBA in Bangladesh compared to other socio-economic factors. Women residing in Khulna division having one child had about 2.5 times probability of utilizing SBA services. Exposure to media also played a significant role in utilization of SBA among Bangladeshi mothers. Our result is consistent with the findings of Kibria et al., who also showed that higher wealth quintile, Khulna Division and women living in urban areas were significantly associated with the increased likelihood of a delivery by SBAs (Kibria et al., 2017). On the other hand, Bhowmik et al., in their study reported that residence, age at first birth, wealth index, working status, participation in household decision making and mothers' education were significant predictors of using SBA services in Bangladesh (Bhowmik et al., 2019).

Table 2
Factors associated with the utilization of reproductive health services among the Bangladeshi married women.

Characteristics	Contraception aOR [a] (95% CI)	Antenatal care aOR [b] (95% CI)	Skilled birth attendant aOR [b] (95% CI)	All three aOR [b] (95% CI)
Age (years)				
15–19	0.74 (0.29–1.91)	1.26 (0.51–3.13)	0.47 (0.15–1.42)	0.67 (0.19–2.30)
20–24	0.79 (0.31–2.00)	1.01 (0.42–2.41)	0.57 (0.19–1.68)	0.70 (0.20–2.41)
25–29	0.77 (0.30–1.95)	1.04 (0.44–2.46)	0.66 (0.22–1.94)	0.76 (0.22–2.58)
30–34	0.78 (0.30–1.97)	1.09 (0.47–2.53)	0.84 (0.28–2.47)	0.87 (0.25–2.97)
35–39	0.81 (0.31–2.10)	0.93 (0.41–2.14)	0.71 (0.24–2.08)	0.81 (0.23–2.79)
40–44	0.58 (0.21–1.58)	0.63 (0.24–1.64)	0.86 (0.27–2.75)	0.71 (0.18–2.71)
45–49	Ref.	Ref.	Ref.	Ref.
Education				
Higher secondary +	1.00 (0.80–1.25)	3.88 (2.78–5.40) ***	3.88 (2.96–5.08) ***	2.63 (1.99–3.47) ***
Secondary	0.98 (0.81–1.19)	2.55 (2.05–3.16) ***	2.11 (1.72–2.58) ***	1.98 (1.56–2.53) ***
Primary	0.93 (0.76–1.14)	1.63 (1.33–1.99) ***	1.20 (0.97–1.48)	1.31 (1.01–1.68) *
Pre-primary or none	Ref.	Ref.	Ref.	Ref.
Wealth index				
Richest	0.80 (0.66–0.96) *	7.36 (5.03–10.78) ***	5.97 (4.61–7.71) ***	2.46 (1.94–3.12) ***
Rich	0.86 (0.73–1.01)	2.86 (2.21–3.69) ***	2.60 (2.15–3.14) ***	1.96 (1.61–2.37) ***
Middle	0.94 (0.80–1.10)	1.84 (1.49–2.28) ***	1.87 (1.56–2.23) ***	1.54 (1.28–1.85) ***
Poor	1.16 (0.99–1.36)	1.28 (1.07–1.53) **	1.41 (1.20–1.65) ***	1.35 (1.13–1.60) **
Poorest	Ref.	Ref.	Ref.	Ref.
Habitat				
Urban	1.41 (1.21-1.64) ***	1.06 (0.84-1.34)	1.12 (0.95-1.32)	1.33 (1.14-1.54) ***
Rural	Ref.	Ref.	Ref.	Ref.
Division				
Barishal	1.51 (1.19–1.91) **	1.38 (1.02–1.88) *	0.88 (0.67–1.15)	1.12 (0.85–1.47)
Chattogram	0.86 (0.70–1.05)	1.15 (0.87–1.53)	0.98 (0.76–1.26)	0.93 (0.72–1.21)
Dhaka	1.20 (0.99–1.47)	1.14 (0.86–1.51)	1.02 (0.79–1.32)	1.11 (0.87–1.42)
Khulna	1.60 (1.29–1.98) ***	2.60 (1.86–3.64) ***	2.56 (1.94–3.36) ***	2.23 (1.73–2.88) ***
Mymensingh	1.42 (1.09–1.85) **	0.85 (0.61–1.17)	0.61 (0.46–0.81) **	0.80 (0.59–1.08)
Rajshahi	1.46 (1.16–1.84) **	1.11 (0.81–1.52)	1.28 (0.98–1.67)	1.36 (1.04–1.76) *
Rangpur	1.85 (1.48–2.32) ***	1.62 (1.20–2.18) **	1.37 (1.04–1.79) *	1.73 (1.33–2.26) ***
Sylhet	Ref.	Ref.	Ref.	Ref.
Number of children (ever born)				
1	0.97 (0.85–1.10)	1.91 (1.48–2.48) ***	2.57 (2.08–3.17) ***	1.53 (1.25–1.87) ***
2	0.97 (0.85–1.10)	1.28 (1.07–1.54) **	1.30 (1.12–1.52) **	1.14 (0.97–1.33)
3 +	Ref.	Ref.	Ref.	Ref.
Wanted last pregnancy				
Yes	0.84 (0.74–0.94) **	1.06 (0.91–1.24)	1.00 (0.88–1.13)	0.91 (0.80–1.04)
No	Ref.	Ref.	Ref.	Ref.
Age of husband (years)				
≤ 25	1.11 (0.92–1.33)	0.66 (0.49–0.91) *	0.88 (0.67–1.15)	1.02 (0.79–1.31)
26–39	1.09 (0.95–1.24)	0.96 (0.78–1.18)	1.06 (0.89–1.27)	1.07 (0.90–1.27)
≥ 40	Ref.	Ref.	Ref.	Ref.
Media exposure				
Yes	1.19 (1.05–1.34) **	1.51 (1.27–1.79) ***	1.43 (1.26–1.62) ***	1.44 (1.26–1.63) ***
No	Ref.	Ref.	Ref.	Ref.

Ref. = Reference category
* $p < 0.05$,
** $p < 0.01$,
*** $p < 0.001$
[1] Adjusted with wealth, habitat, division, and wanted last pregnancy
[2] Adjusted with all the variables in the table

Our study also indicated that only 36.9% of women received all (i.e., use of contraception, at least one prenatal care, delivery attendant by skilled medical personnel) reproductive health services. This indicate that a large portion of women are out of the availability and accessibility to reproductive health services in Bangladesh. Prevalence of utilizing all three reproductive health services was significantly higher among the younger age group. The use of all three reproductive health services gradually increased with an increase of mother's education and was found to be highest for women who received higher secondary and above level of education and among women belongs to the richest family wealth index quintile. One study found that adolescents whose educational level was primary was less likely to use reproductive health services than those whose educational level was secondary and higher (Abraham et al., 2019). Another study found that women's decision making power which gradually increase with age and education had a positive correlation with the uptake of reproductive health services in Pakistan (Hou and Ma, 2015). This study highlighted that institutional education had a major role on utilization of reproductive health services in Bangladesh. From the practical point of view, it is not possible to increase institutional form of education of the mothers at this stage of their life; however, reproductive health service education can be disseminated through country's large number of community health workers. Moreover, utilization of reproductive health services was higher among women who lived in the Urban area or in Khulna division. Significant regional variations in the use of reproductive health services indicate a gap in the existing health service delivery system in Bangladesh. Besides these, higher number of women were found to be used all three services who gave birth to their first children; wished for their last pregnancy and were exposed to the media. Support to the women for using of all three services was given in higher number by the husbands whose age was in the range of 26-39 years. The age of husband had been shown

to be significantly associated with male involvement in family planning and reproductive health in Bangladesh (Kamal et al., 2013).

Our present study is not immune to limitations. Data was cross-sectional in nature; therefore, causality cannot be explained. We advise caution while interpreting the results. Additionally, we were not able to include all potential variables (as the variables were limited in the dataset) and the study is therefore not able to describe the entire story of the utilization of reproductive health services in Bangladesh. Regardless, this study shed light on current status of reproductive health services utilization in Bangladesh through the latest nationally representative data which is the major strength of the study.

Conclusion

Around one-third of Bangladeshi married women utilized all three reproductive health services i.e., contraception, antenatal care and skilled birth attendant; however, variation exists in using these at individual services. Higher education, higher wealth, habitat, number of children and exposure to media are associated with increased access to combined reproductive health services in Bangladesh. Although, Bangladesh made improvement in increasing the reproductive health services among the married women, mass public health campaign giving special attention focusing on women education and increase the coverage of media advertisement related reproduction health service may boost the improvement in achieving the SDG targets.

Author Contribution

MSA – Conceptualization, Formal analysis, Writing original draft, Finalization.

SK – Writing original draft, Review and editing.

FMY – Supervision, Review and editing, Finalization.

Ethical approval

As this study is based on a secondary data set we did not require any ethical approval from any institution. We received authorization from MICS to use this data set for our study.

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We did not receive any funding for this study.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.midw.2021.103139.

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