

RESEARCH ARTICLE

Factors influencing menstrual regulation and its socioeconomic inequalities among ever-married women in Bangladesh: Findings from a nationwide cross-sectional survey

Satyajit Kundu 

Faculty of Nutrition and Food Science, Patuakhali Science and Technology University, Patuakhali, 8602, Bangladesh and School of Public Health, Southeast University, Nanjing 210009, China
Email: satyajitnfs@gmail.com

(Received 9 April 2022; revised 9 September 2022; accepted 9 September 2022; first published online 14 October 2022)

Abstract

Despite a significant drop in maternal mortality in Bangladesh, unsafe abortion remains a critical maternal health issue that could be reduced by promoting menstrual regulation (MR). This study aimed to investigate the prevalence and determinants of MR use among ever-married women as well as to identify the socioeconomic inequalities in MR use in Bangladesh. The latest Bangladesh Demographic and Health Survey (BDHS) 2017–18 data were used in this study. We used a sub-sample of 12,586 ever-married women aged 15 to 49 years for this study. To identify the determinants of MR, multilevel (mixed-effect) binary logistic regression analysis was used while accounting for potential between-clusters variations. The weighted prevalence of MR was 7.64% (95% CI: 7.19 - 8.12). Women of aged 20–29 years (AOR: 2.50, 95% CI: 1.46, 4.30) and ≥ 30 years (AOR: 4.17, 95% CI: 2.39, 7.26), from urban areas (AOR: 1.24, 95% CI: 1.04, 1.47), having one or two children (AOR: 1.96, 95% CI: 1.25, 3.09) and ≥ 3 children (AOR: 2.26, 95% CI: 1.40, 3.65), who used traditional contraceptive method (AOR: 1.39, 95% CI: 1.12, 1.73), and from Barishal division (AOR: 1.44, 95% CI: 1.08, 1.93) were more likely to have MR. Women were less likely to have MR if they were from Chittagong (AOR: 0.62, 95% CI: 0.46, 0.84) and Mymensingh (AOR: 0.51, 95% CI: 0.36, 0.73) divisions. MR use was found to be higher among higher socioeconomic status (SES) groups as the concentration index (CIX) value was positive and the Lorenz curve lay below the line of equality (CIX: 0.095, $p < 0.001$). Health policy and intervention design should prioritize minimizing socioeconomic inequities concerning MR services.

Keywords: Socioeconomic inequality; Concentration index; Menstrual regulation; Abortion; Bangladesh

Introduction

Unsafe abortion is one of the primary causes of maternal mortality around the world, and maternal deaths are more common in areas where abortion is restricted or outlawed (Say *et al.*, 2014). According to World Health Organization (WHO), 45% of all abortion are unsafe, while almost all these unsafe abortions happen in developing countries (WHO, 2022). An abortion is considered safe if it is done with a method recommended by the World Health Organization and appropriate to the pregnancy duration, and by the person with the necessary skills. If either of these conditions is not met, the abortion is unsafe (MFS, 2022; WHO, 2022). Abortion is illegal in Bangladesh unless it is necessary to preserve a woman's life. Menstrual regulation (MR) has, on the other

hand, been accessible in the country since 1979 (Guttmacher Institute, 2012). According to the WHO, “MR is the process of uterine evacuation without laboratory or ultrasound confirmation of pregnancy for women who report recent delayed menses” (WHO, 2012). Abortion is performed on the basis of a confirmed pregnancy, while MR procedure is performed when pregnancy is suspected based on menstrual delay by inducing the menstrual cycle (Johnston *et al.*, 2011). In 1979, national family planning program of the country included MR program in Bangladesh which allows women to securely confirm nonpregnancy following a missing period and avoid recourse to unsafe abortion (Guttmacher Institute, 2012; Population control and family planning division, 1979). Without a confirmed diagnosis of pregnancy, MR entails the use of either manual vacuum aspiration (MVA) or drugs (Misoprostol with or without Mifepristone) to induce menstruation. It can be carried out by doctors at up to 12 weeks after the last menstrual period and at up to 10 weeks by nurses (Guttmacher Institute, 2012). The government has legalized menstrual regulation, and safe MR services are available in both government and private health facilities (Hossain *et al.*, 2016).

Abortion-related fatalities and complications continue to be a serious maternal health issue in Bangladesh, despite the fact that total maternal mortality has decreased significantly over the last two decades (El Arifeen *et al.*, 2014). In Bangladesh, the number of abortions and the ratio of abortions to maternal mortality increased from 2010 to 2016 (Singh *et al.*, 2017, 2018). In Bangladesh, there were predicted to be 1,194,000 induced abortions in 2014, with many of these likely being performed in hostile conditions or by unskilled personnel, resulting in serious medical complications such as incomplete abortion, hemorrhage, cervical lacerations, sepsis, uterine perforation, bladder injury, and shock (Guttmacher Institute, 2017; Hossain *et al.*, 2017). Abortion also has significant socioeconomic and psychological consequences (El Arifeen *et al.*, 2014). In this setting, MR could be a viable alternative to birth control, as well as a means of addressing the hazards associated with Bangladesh’s high rate of induced abortion (Alam & Sultan, 2019). In a study of over 100,000 pregnancies in Bangladesh, it was discovered that in comparison to live birth, MR had a decreased risk of maternal mortality, but abortion had a greater incidence of maternal death. (Rahman *et al.*, 2014).

Bangladesh’s government took several steps to improve the accessibility of MR services such as training of nurses and midwives, increasing the number of MR service providers, making MR services free, expanding the time period for authorizing MR, creating national MR guidelines on provision of services and quality of service, and integrating medicinal MR, etc. (Benson *et al.*, 2011; Guttmacher Institute, 2012; Hossain *et al.*, 2017). However, there has been a significant drop in the use of MR services in Bangladesh (Alam & Sultan, 2019). In 2014, the number of MR procedures performed in public and private facilities in Bangladesh fell by 34%, to an estimated 430,000 procedures (Marie Stopes Bangladesh, 2021). Hence, it is important to identify the potential determinants of MR use so that intervention could be designed focusing on the increasing use of MR, which can curb maternal mortality in Bangladesh.

Although a cross-sectional study (Rana *et al.*, 2019) was undertaken on MR use in Bangladesh using the previous BDHS data, no study has assessed the prevalence and determinants of MR in Bangladesh using the latest BDHS 2017-18 data set. Furthermore, the previous study advised that socioeconomic inequalities in MR services should be reduced; however, to our knowledge, socioeconomic inequalities in MR services have not yet been studied. Moreover, as high usage of MR services is constantly expected for limiting births in populous countries like Bangladesh, a frequent inspection of prevalence and determinants is essential to track its present state. However, there is a dearth of evidence assessing the prevalence and determinants of MR, and its socioeconomic inequalities in Bangladesh. Hence, this study would be an addition to fulfill the research gaps. This study aimed to investigate the prevalence of and factors affecting MR among ever-married women of reproductive age (15 to 49 years) in Bangladesh as well as to identify the socioeconomic inequalities in MR using nationally representative survey data.

Methods

Data sources and study design

This study extracted data from the most recent BDHS 2017-18. The survey was carried out from October 2017 to March 2018 under the National Institute of Population Research and Training (NIPORT), Bangladesh (NIPORT and ICF, 2020). A two-stage stratified sampling design was used in BDHS 2017-18 to select the households from a list of enumeration areas (EAs). Initially, 250 EAs from urban areas and 425 EAs from rural areas were chosen. These EAs were considered as the primary sampling unit (PSU) and had a total of 20,250 households (NIPORT and ICF, 2020). The survey collected data from 20,127 ever-married women aged 15 to 49 years. The detailed sampling procedure is provided in the final report of the BDHS 2017-18 (NIPORT and ICF, 2020). Participants who were currently pregnant ($n=739$) and had never heard about MR ($n=5,781$) were excluded from this study. Then after excluding the missing cases, we used a sub-sample of 12,711 ever-married women aged 15-49 years as the final sample of this study. After adjusting for survey sampling weights and survey design characteristics, the weighted sample size was 12,586.

Outcome variable

In the BDHS 2017-18 survey, MR use was assessed by asking the following question to the ever-married women of reproductive age: have you ever used MR? This question was asked to those women who have ever heard of MR (NIPORT and ICF, 2020). The outcome variable was thus dichotomized and coded as “1” for those who ever used MR service and “0” for otherwise (Yes/No).

Explanatory variables

A thorough literature search was conducted in the following database: PubMed, Scopus and Google Scholar, and based on the previous study (Rana *et al.*, 2019), we selected the potential explanatory variables for this study. We categorized religion as Muslim versus non-Muslim since about 90% of the population in Bangladesh are Muslim (NIPORT and ICF, 2020). The household wealth status (wealth quintiles) was constructed using principal component analysis based on the different household assets such as televisions and bicycles; materials used for housing construction; and types of water access and sanitation facilities which had five wealth quintiles from 1 (poorest) to 5 (richest). The details of the assessment of the household wealth index can be found in the survey report (NIPORT and ICF, 2020). The body mass index (BMI) was classified based on the World Health Organization (WHO) as follows: underweight (<18.5 kg/m²), normal (18.5–24.9 kg/m²), overweight (25.0–29.9 kg/m²), and obese (≥ 30.0 kg/m²) (World Health Organization, 2020).

The decision-making power was measured from three factors (respondent involvement in decision on her healthcare, decision on large household purchases, and decision on visits to family or relatives) (Ekholuenetale *et al.*, 2021). Using Principal Component Analysis (PCA), the factors were distilled into a more generalized set of weights that score “decision making power” between 0 and 100. The standardized z-scores were used to disentangle the overall assigned scores to low, and high (Ekholuenetale *et al.*, 2021). Wife beating was measured by aggregating responses from women and categorized into low and high. The following items were used: “beating justified if wife goes out without telling husband”, “beating justified if wife neglects the children”, “beating justified if wife argues with husband”, “beating justified if wife refuses to have sex with husband”, and “beating justified if wife burns the food” (Ekholuenetale *et al.*, 2021).

Statistical analysis

Because of the complex nature of the BDHS survey, the data were processed using survey weights prior to analysis. Descriptive statistics including frequencies and percentages were reported. We used the “svy” command for assigning the sample weight to adjust for clustering effect and sample

stratification in STATA version 16.0 (StataCorp., College Station, TX, USA). Then, we reported the weighted prevalence of using MR by background characteristics of study participants. Since the BDHS 2017-18 used a two-stage stratified cluster sampling having a hierarchical composition, a single-level analysis model would not be suitable for analyzing such a data set (Khan & Shaw, 2011). Thus, to reduce the cluster effect that exists in the dataset, a multilevel (mixed-effect) binary logistic regression analysis was used to identify the factors associated with MR use, where clusters were considered as level-2 factor. Both the univariate and multivariate mixed-effect logistic regression models were used to estimate the odds ratios (ORs) and 95% confidence interval (CI). Only the significant variables with a p-value of less than 0.05 in the univariate logistic regression model were included in the multivariate regression model (final model) (Rana *et al.*, 2019). For measures of variation, we also calculated the median odds ratio (MOR) to check the cluster-to-cluster variability in MR use.

Lorenz curve and concentration index (CIX) were used to examine the inequalities in using MR by wealth quintile (Jann, 2016; O'Donnell *et al.*, 2016). When the concentration index was positive or the Lorenz curve was below the diagonal line (line of equality), it meant that using MR was higher among high wealth-indexed groups (high household wealth groups). Contrary, when the concentration index value was negative or the Lorenz curve lay above the diagonal line of equality, it indicates that using MR was higher among low wealth-indexed groups. In the Lorenz curve, a higher degree of inequality was confirmed by how far away the curves sagged away from the line of equality. Concentration index was used to compute the contrast in using MR (Ekholuenetale *et al.*, 2020). We used Stata version 16.0 (StataCorp., College Station, TX, USA) for analyzing the Lorenz curve and concentration index. The statistical significance was determined at $p < 0.05$.

Results

Background characteristics

A total of 12,586 ever-married women of reproductive age was included in this study. Of them, more than half (56.61%) were aged ≥ 30 years; about 14% had no formal education, 50% were unemployed, and 90% were Muslim. About 69% of participants were from rural areas and 16% were from families with the highest wealth quintile. Among the study women, 32% women reported that they didn't use contraceptive methods, and 92% of women had at least one child, while 31.9% of women had a desire for more children. About 36% of women's decision-making power was low (Table 1).

Prevalence of MR

The overall prevalence of MR was 7.64% (95% CI: 7.19 - 8.12). This study shows that the prevalence of MR increased with the increasing age, where the highest prevalence (9.94%, 95% CI: 9.27 - 10.66) was found in older age group (≥ 30 years). Similarly, the proportion of MR uses increased with the increase of wealth status among women. The highest prevalence of MR was found among mothers in the highest wealth quintile (9.79%, 95% CI: 8.76 - 10.92). The proportion of MR was higher in women from urban areas (9.14%, 95% CI: 8.27 - 10.10) compared to women from rural areas (6.99%, 95% CI: 6.48 - 7.55). Among the administrative divisions, the highest prevalence was found in Barishal (10.64%, 95% CI: 8.55 - 13.17), while the lowest was in Mymensingh (3.70%, 95% CI: 2.71 - 5.02). The prevalence of having MR was higher among women who had ≥ 3 children (9.56%, 95% CI: 8.75 - 10.43) compared to those having no child (2.63%, 95% CI: 1.76 - 3.91). The proportion of using MR was higher among those who used the traditional contraceptive method (11.92%, 95% CI: 10.31 - 13.74). The prevalence of MR was also higher among women who had knowledge of ovulatory cycles (8.43%, 95% CI: 7.67 - 9.26) compared to those who had not (7.17%, 95% CI: 6.62 - 7.76) (Table 1).

Table 1. Weighted prevalence of menstrual regulation by background characteristics (N = 12,586)

Characteristics	Categories	Frequency (%)	Prevalence of MR % (95% CI)
Overall		12586	7.64 (7.19 – 8.12)
Sociodemographic characteristics			
Age of woman	< 20 years	935 (7.43)	1.68 (1.03 – 2.73)
	20 – 29 years	4525 (35.96)	5.26 (4.65 – 5.95)
	≥ 30 years	7125 (56.61)	9.94 (9.27 – 10.66)
Educational level of woman	No education	1764 (14.01)	7.15 (6.03 – 8.45)
	Primary	3832 (30.44)	8.47 (7.63 – 9.4)
	Secondary	5164 (41.02)	7.33 (6.65 – 8.08)
	Higher	1827 (14.52)	7.27 (6.17 – 8.56)
Religion	Muslim	11328 (90.00)	7.72 (7.25 – 8.23)
	Non-Muslim	1258 (10.00)	6.95 (5.67 – 8.49)
Education level of husband	No education	2523 (20.04)	6.53 (5.63 – 7.56)
	Primary	3877 (30.80)	7.50 (6.71 – 8.38)
	Secondary	3860 (30.67)	8.26 (7.43 – 9.17)
	Higher	2327 (18.49)	8.07 (7.03 – 9.25)
Employment status of woman	Yes	6288 (49.96)	7.73 (7.09 – 8.42)
	No	6298 (50.04)	7.56 (6.93 – 8.24)
Wealth quintile	Poorest	2089 (16.60)	5.30 (4.42 – 6.35)
	Poorer	2388 (18.98)	7.13 (6.16 – 8.23)
	Middle	2561 (20.35)	7.85 (6.87 – 8.96)
	Richer	2655 (21.09)	7.42 (6.49 – 8.48)
	Richest	2893 (22.98)	9.79 (8.76 – 10.92)
Residential status	Urban	3819 (30.34)	9.14 (8.27 – 10.10)
	Rural	8767 (69.66)	6.99 (6.48 – 7.55)
Geographical division	Barishal	692 (5.50)	10.64 (8.55 – 13.17)
	Chittagong	2143 (17.02)	5.46 (4.57 – 6.51)
	Dhaka	3406 (27.06)	8.42 (7.53 – 9.40)
	Khulna	1319 (10.48)	7.37 (6.08 – 8.91)
	Mymensingh	1056 (8.39)	3.70 (2.71 – 5.02)
	Rajshahi	1729 (13.74)	8.20 (7.00 – 9.59)
	Rangpur	1594 (12.66)	10.54 (9.12 – 12.14)
	Sylhet	648 (5.15)	5.98 (4.39 – 8.08)
Reproductive characteristics			
Parity	No	889 (7.06)	2.63 (1.76 – 3.91)
	1 – 2	6991 (55.55)	6.99 (6.42 – 7.62)
	≥ 3	4706 (37.39)	9.56 (8.75 – 10.43)

(Continued)

Table 1. (Continued)

Characteristics	Categories	Frequency (%)	Prevalence of MR % (95% CI)
Knowledge of ovulatory cycles	Yes	4745 (37.70)	8.43 (7.67 – 9.26)
	No	7842 (62.30)	7.17 (6.62 – 7.76)
Method of contraceptive use	Not use	4071 (32.34)	6.60 (5.88 – 7.40)
	Traditional method	1374 (10.91)	11.92 (10.31 – 13.74)
	Modern method	7141 (56.74)	7.42 (6.83 – 8.05)
Desire for more children	Wants more	4016 (31.91)	4.88 (4.26 – 5.60)
	Wants no more	7015 (55.73)	9.05 (8.40 – 9.74)
	Others	1555 (12.36)	8.46 (7.17 – 9.95)
Women's empowerment			
Decision making power	High	7980 (63.40)	7.82 (7.25 – 8.43)
	Low	4606 (36.60)	7.34 (6.62 – 8.12)
Wife beating	High	2346 (18.64)	8.39 (7.34 – 9.58)
	Low	10240 (81.36)	7.47 (6.98 – 8.00)

CI: Confidence Interval

Factors influencing MR

The multilevel (mixed-effect) binary logistic regression showed that women aged 20 to 29 years (adjusted odds ratio [AOR]: 2.50, 95% confidence interval [CI]: 1.46, 4.30) and ≥ 30 years were more likely to use MR compared to those aged < 20 years (AOR: 4.17, 95% CI: 2.39, 7.26). Urban women were 24% more likely to use MR compared to rural women (AOR: 1.24, 95% CI: 1.04, 1.47). Compared to the women in the middle wealth quintile, women in the lowest wealth quintile were 44% less likely (AOR: 0.66, 95% CI: 0.51, 0.85) and in the highest quintile were 26% more likely to have MR (AOR: 1.26, 95% CI: 1.03, 1.39). Women who had one or two children (AOR: 1.96, 95% CI: 1.25, 3.09) and ≥ 3 children (AOR: 2.26, 95% CI: 1.40, 3.65) had higher odds of having MR compared to those who had no child. Overweight (AOR: 1.33, 95% CI: 1.14, 1.55) and obese (AOR: 1.37, 95% CI: 1.09, 1.73) women had increased odds of having MR compared to women with normal body mass index. The likelihood of having MR was 39% higher among women who used the traditional contraceptive method compared to women who didn't use any contraceptive method (AOR: 1.39, 95% CI: 1.12, 1.73). Compared to the Dhaka division, women from Chittagong (AOR: 0.62, 95% CI: 0.46, 0.84) and Mymensingh (AOR: 0.51, 95% CI: 0.36, 0.73) were less likely to have MR, while women from Barishal (AOR: 1.44, 95% CI: 1.08, 1.93) were more likely to have MR (Table 2).

Socioeconomic inequalities in MR

Household wealth-related inequalities in using MR among ever-married women in Bangladesh were also estimated using Lorenz curves and concentration index [CIX] values. MR use was found to be higher among higher socioeconomic status (SES) groups as the CIX value was positive and the Lorenz curve lay below the line of equality (CIX: 0.095, $p < 0.001$) (Figure 1).

Discussion

While abortion procedures have been illegal since 1860 (under colonial rule), MR provides a means for women to resume menstruation without necessitating confirmation of a pregnancy

Table 2. Multilevel logistic regression for determining the factors affecting menstrual regulation of study participants

Characteristics	Categories	Unadjusted OR (95% CI)	Adjusted OR (95% CI)
Age of woman	< 20 years	Ref.	Ref.
	20 – 29 years	3.39^{***} (2.00, 5.74)	2.50^{**} (1.46, 4.30)
	≥ 30 years	6.82^{***} (4.07, 11.43)	4.17^{***} (2.39, 7.26)
Educational level of woman	No education	Ref.	Ref.
	Primary	1.27[*] (1.02, 1.58)	1.29 (0.99, 1.63)
	Secondary	1.19 (0.96, 1.48)	1.23 (0.95, 1.59)
	Higher	1.27 (0.99, 1.62)	1.13 (0.81, 1.58)
Religion	Muslim	1.09 (0.88, 1.35)	Not included
	Non-Muslim	Ref.	
Education level of husband	No education	Ref.	Ref.
	Primary	1.17 (0.96, 1.43)	1.19 (0.96, 1.47)
	Secondary	1.40^{**} (1.15, 1.70)	1.36^{**} (1.08, 1.71)
	Higher	1.44^{**} (1.17, 1.77)	1.32^{**} (1.04, 1.61)
Employment status of woman	Yes	0.97 (0.85, 1.10)	Not included
	No	Ref.	
Wealth quintile	Poorest	0.61^{***} (0.48, 0.78)	0.66^{**} (0.51, 0.85)
	Poorer	0.82 (0.66, 1.01)	0.86 (0.69, 1.08)
	Middle	Ref.	Ref.
	Richer	0.97 (0.80, 1.19)	0.92 (0.74, 1.14)
	Richest	1.30^{**} (1.09, 1.56)	1.26^{**} (1.03, 1.39)
Residential status	Urban	1.46^{***} (1.28, 1.66)	1.24[*] (1.04, 1.47)
	Rural	Ref.	Ref.
Geographical division	Barishal	1.32[*] (1.05, 1.66)	1.44[*] (1.08, 1.93)
	Chittagong	0.64^{**} (0.49, 0.83)	0.62^{**} (0.46, 0.84)
	Dhaka	Ref.	Ref.
	Khulna	1.02 (0.80, 1.29)	1.02 (0.77, 1.35)
	Mymensingh	0.42^{***} (0.31, 0.57)	0.51^{***} (0.36, 0.73)
	Rajshahi	1.07 (0.85, 1.34)	1.21 (0.91, 1.59)
	Rangpur	1.38^{**} (1.11, 1.72)	1.25 (0.97, 1.31)
	Sylhet	0.74[*] (0.56, 0.97)	0.81 (0.59, 1.12)
Parity	No	Ref.	Ref.
	1 – 2	3.14^{***} (2.06, 4.79)	1.96^{**} (1.25, 3.09)
	≥ 3	4.01^{***} (2.62, 6.14)	2.26^{**} (1.40, 3.65)
Knowledge of ovulatory cycles	Yes	1.15[*] (1.01, 1.31)	1.10 (0.95, 1.26)
	No	Ref.	Ref.
Method of contraceptive use	Not use	Ref.	Ref.

(Continued)

Table 2. (Continued)

Characteristics	Categories	Unadjusted OR (95% CI)	Adjusted OR (95% CI)
	Traditional method	1.88^{***} (1.54, 2.28)	1.39^{**} (1.12, 1.73)
	Modern method	1.08 (0.93, 1.25)	0.99 (0.84, 1.16)
Desire for more children	Wants more	0.50^{***} (0.42, 0.58)	0.88 (0.71, 1.08)
	Wants no more	Ref.	Ref.
	Others	0.86 (0.71, 1.05)	0.88 (0.72, 1.08)
Decision making power	High	1.04 (0.88, 1.22)	Not included
	Low	Ref.	
Wife beating	High	1.07 (0.93, 1.22)	Not included
	Low	Ref.	
Variance (95% CI)		–	0.45^{***} (0.35, 0.58)
Median Odds Ratio (MOR)			1.89

OR: Odds Ratio, CI: Confidence Interval
^{*}p < 0.05, ^{**}p < 0.01, ^{***}p < 0.001

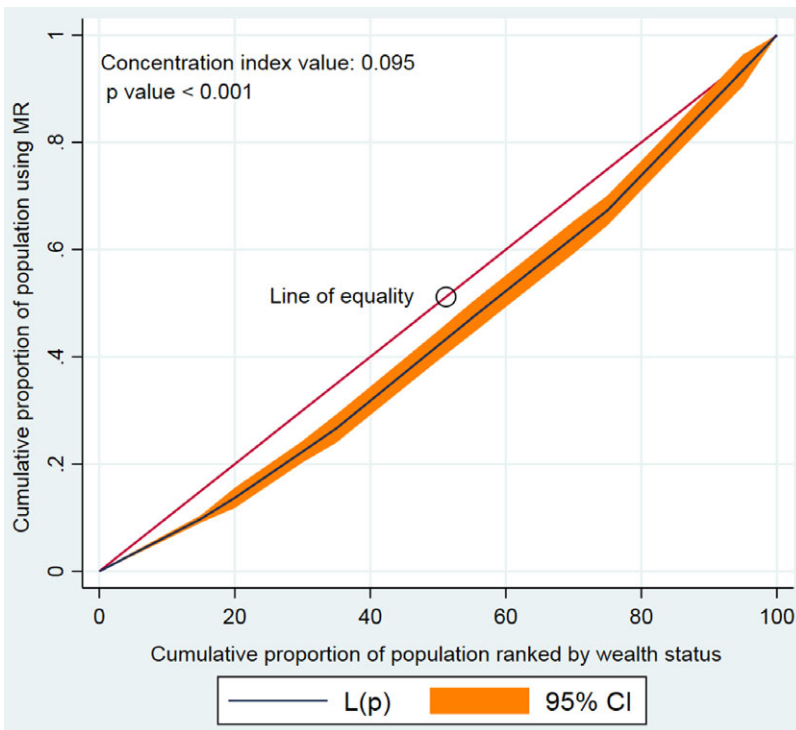


Figure 1. Concentration curve for MR use.

(Guttmacher Institute, 2017). MR includes the use of drugs such as mifepristone and misoprostol to induce uterine bleeding and evacuation. It is possible that some women obtain these drugs clandestinely and use them inappropriately, leading to uterine haemorrhage among other complications (Guttmacher Institute, 2017). This study aimed to investigate the prevalence and

determinants of MR use among ever-married women as well as to identify the socioeconomic inequalities in MR in Bangladesh. The finding of this study shows that one in every thirteen women in Bangladesh used MR in their reproductive age. Women aged 20-29 years and ≥ 30 years, from urban areas, having one or two children and ≥ 3 children, who were overweight and obese, and used traditional contraceptive methods were more likely to have MR. MR use was lower among women from Chittagong and Mymensingh divisions. Besides, MR use was higher among higher socioeconomic status (SES) groups.

We found that the prevalence of MR among women in Bangladesh was 7.64%, while in 2014, it was reported as 12.3% indicating a decline in using MR services in Bangladesh (Rana *et al.*, 2019). A rising trend of contraception use, for instance, increased from 62% in 2014 (Hossain *et al.*, 2018) to 68% in 2018 (Khan *et al.*, 2022), which might be a plausible reason for why Bangladeshi women are less likely to seek MR services (Rana *et al.*, 2019). Furthermore, evidence shows that social or religious issues, conservative health attitudes, aversion to performing MR, a lack of competent training, inadequate personnel or equipment, and space may all contribute to the significant drop in using MR services in Bangladesh, especially in the Union Health and Family Welfare Centers (UH & FWCs) that mainly provides MR services in the rural regions (Hossain *et al.*, 2017; Vlassoff *et al.*, 2012). A lack of training in a group of recently employed providers who were hired to replace a large group of providers who have reached retirement age might be contributing to the reduction in the proportion of MR service providers UH & FWCs (Guttmacher Institute, 2017).

According to the findings of this study, women with a higher socioeconomic status were more likely to use MR than their counterparts. In addition, socioeconomic inequalities in MR use were also discovered. Previous studies conducted in developing countries consistently found a significant association between SES and MR use (Ankara, 2017; Bose & Trent, 2006; Rana *et al.*, 2019). Women with higher socioeconomic status have more possession over their reproductive conduct, have a better quality of life, and have better access to health care from both public and private services (Bose & Trent, 2006). Another explanation might be linked to the accessibility of family planning services. Women with lower SES may have less access to family planning services, resulting in lower rates of MR use (Adato *et al.*, 2011). In contrast to our findings, previous study has found that higher SES in women is associated with a reduced incidence of MR (Gil-Lacruz *et al.*, 2012). However, the study was undertaken in a developed country, which has quite different structural dynamics than developing countries (DaVanzo *et al.*, 2013).

The MR use was more prevalent among older women compared to their younger counterparts which is consistent with the finding of a prior study (Tan, 1983). Earlier literature reported that older women are more likely to utilize safer methods of pregnancy termination than younger women who use less secure methods (DaVanzo & Rahman, 2014). This could be due to the fact that older women are more likely than younger women to be aware of safe ways of termination and to be aware of the consequences connected with less-safe procedures (DaVanzo & Rahman, 2014), MR is an effective reproductive health service to terminate pregnancies (Population Council Bangladesh, 1999). Another perception-based study reported that pregnancies in older women are often argued as shameful in Bangladesh, while MR could be an acceptable alternative among them (Tan, 1983). These are some of the likely explanations for why older women use MR more than younger women. The number of children or parity was found to be positively linked with MR use. This finding corroborates an earlier study that found a link between the number of living children or parity with the likelihood of obtaining MR services in Bangladesh (Rana *et al.*, 2019). The use of MR services to restrict or postpone births in order to reduce their family size, which is common in South Asian countries (DaVanzo & Rahman, 2014), might be a plausible explanation of our finding.

Results indicate that women from urban areas were more prone to use MR services than rural women. Differences in the prevalence of MR between rural and urban women might be due to differences in access to health facilities, healthcare-related information, and access to the media. This could also be due to that although MR services are provided by the UH & FWCs and NGOs,

mainly in suburban and rural regions, barely half of the UH & FWCs in Bangladesh are able to provide MR services (Hossain *et al.*, 2017; Singh *et al.*, 2017).

The prevalence of MR use was inconsistent with the geographical variation, which revealed that women in the Mymensingh and Chittagong divisions were less likely than women in the Dhaka division to have MR. According to earlier studies (Kant *et al.*, 2015; Kapil Ahmed *et al.*, 2005), women in Mymensingh and Chittagong may have less awareness and access to MR services, as well as experience more constraints and social stigma compared to women in the Dhaka division. In addition, due to the larger density of governmental and private clinics, hospitals, and NGOs in the capital city (Dhaka) of Bangladesh than in other areas, MR services are largely provided there (Rana *et al.*, 2019). However, women from Barishal division were more likely to have MR compared to those from Dhaka division. This finding could be explained by the division-wise adult literacy rate in Bangladesh, where Barishal is ahead with 84.1% among all the divisions (Dhar, 2021). Further research is needed to find out the causal reasons of this geographical disparities in MR use in Bangladesh.

This study's strength is the generalizability of the findings for Bangladesh, since this survey included nationally representative data from all administrative divisions of the country. In addition, appropriate statistical procedures were used to assess the sample's weighted prevalence of MR use as well as to identify the associated factors. Besides, this is the first study that measured the socioeconomic inequalities in MR services in Bangladesh, however, the decomposition of the concentration index value may aid in determining the proportion of inequality caused by different explanatory variables. Thus, further study on decomposing the concentration index for socio-economic inequalities in MR use in Bangladesh is recommended. The study had some limitations also. No causality could be established due to the cross-sectional design of the study. The information on utilization of MR services was self-reported by ever-married women, thereby putting at risk of recall bias. Regardless, these limitations do not over-ride the validity and reliability of the findings of this study.

Conclusion

This study found that the usage of MR services was independently associated with age, residential status, geographical location, SES, parity, and contraceptive method use of the women. Also, socioeconomic inequalities in MR use were found, where MR use was higher among higher SES groups. There was also a need to address the socioeconomic inequalities in MR use. As a result, the findings of this study should be assessed in light of existing and planned policymaking. By making sure accessibility and availability of MR services, health policymakers and intervention designers should focus on limiting socioeconomic inequalities in regard to MR services in Bangladesh.

List of abbreviations. MR: Menstrual Regulation; SES: Socioeconomic Status; BDHS: Bangladesh Demographic and Health Survey; NIPORT: National Institute for Population Research and Training EAs: Enumeration Areas; PSU: Primary Sampling Unit; AOR: Adjusted odds ratio; CI: Confidence Interval; MOR: Median Odds Ratio; CIX: Concentration Index; NGO: Non-Government Organization; UH & FWC: Union Health and Family Welfare Center.

Acknowledgements. Author want to thank Demographic Health Surveys (DHS) for providing the datasets with no cost and permit us for using the data for independent research.

Funding. The author received no specific funding for this work.

Conflicts of interest. The author has declared that no competing interests exist.

Ethical approval. Secondary data set was used from the Demographic and Health Surveys (DHS) Programme for this study which is publicly available upon suitable request; therefore, further ethical approval was not required. Details of the ethical procedures followed by the DHS Program can be found in the BDHS report. All the procedures were performed in accordance with the relevant guidelines and regulations.

References

- Adato M, Roopnaraine T, and Becker E** (2011) Understanding use of health services in conditional cash transfer programs: insights from qualitative research in Latin America and Turkey. *Social Science & Medicine* 72(12), 1921–1929.
- Alam MZ, and Sultan S** (2019) Knowledge and practice of menstrual regulation (MR) in Bangladesh: Patterns and determinants. *Journal of Population and Social Studies* 27(3), 220–231.
- Ankara HG** (2017) Socioeconomic variations in induced abortion in Turkey. *Journal of Biosocial Science* 49(1), 99–122.
- Benson J, Andersen K, and Samandari G** (2011) Reductions in abortion-related mortality following policy reform: evidence from Romania, South Africa and Bangladesh. *Reproductive Health* 8(1), 1–12.
- Bose S, and Trent K** (2006) Socio-demographic determinants of abortion in India: a north–south comparison. *Journal of Biosocial Science* 38(2), 261–282.
- DaVanzo J, and Rahman M** (2014) Pregnancy termination in Matlab, Bangladesh: trends and correlates of use of safer and less-safe methods. *International Perspectives on Sexual and Reproductive Health* 40(3), 119–126.
- DaVanzo J, Rahman M, Ahmed S, and Razzaque A** (2013) Influences on pregnancy-termination decisions in Matlab, Bangladesh. *Demography* 50(5), 1739–1764.
- Dhar S** (2021) No Title District-wise Literacy Performance. Retrieved March 22, 2022, from <https://www.daily-sun.com/printversion/details/588596/Districtwise-Literacy-Performance->
- Ekhloenetale M, Mistry SK, Chimoriya R, Nash S, Doyzode AM, and Arora A** (2021) Socioeconomic inequalities in early initiation and exclusive breastfeeding practices in Bangladesh: findings from the 2018 demographic and health survey. *International Breastfeeding Journal* 16(1), 1–18.
- Ekhloenetale M, Tudeme G, Onikan A, and Ekhloenetale CE** (2020) Socioeconomic inequalities in hidden hunger, undernutrition, and overweight among under-five children in 35 sub-Saharan Africa countries. *Journal of the Egyptian Public Health Association* 95(1), 1–15.
- El Arifeen S, Hill K, Ahsan KZ, Jamil K, Nahar Q, and Streatfield PK** (2014) Maternal mortality in Bangladesh: a Countdown to 2015 country case study. *The Lancet* 384(9951), 1366–1374.
- Gil-Lacruz AI, Gil-Lacruz M, and Bernal-Cuenca E** (2012) Socio-economic determinants of abortion rates. *Sexuality Research and Social Policy* 9(2), 143–152.
- Guttmacher Institute** (2012) Menstrual regulation and induced abortion in Bangladesh. Retrieved March 20, 2022, from <https://www.guttmacher.org/sites/default/files/factsheet/menstrual-regulation-unsafe-abortion-bangladesh.pdf>
- Guttmacher Institute** (2017) Menstrual Regulation and Unsafe Abortion in Bangladesh. Retrieved March 20, 2022, from <https://www.guttmacher.org/fact-sheet/menstrual-regulation-unsafe-abortion-bangladesh>
- Hossain A, Maddow-Zimet I, Ingerick M, Bhuiyan HU, Vlassoff M, and Singh S** (2017) Access to and quality of menstrual regulation and postabortion care in Bangladesh: evidence from a survey of health facilities, 2014.
- Hossain A, Moseson H, Raifman S, Gerdts C, Biswas KK, and Foster DG** (2016) ‘How shall we survive’: a qualitative study of women’s experiences following denial of menstrual regulation (MR) services in Bangladesh. *Reproductive Health* 13(1), 1–10.
- Hossain MB, Khan MHR, Ababneh F, and Shaw JEH** (2018) Identifying factors influencing contraceptive use in Bangladesh: evidence from BDHS 2014 data. *BMC Public Health* 18(1), 1–14.
- Jann B** (2016) Estimating Lorenz and concentration curves. *The Stata Journal* 16(4), 837–866.
- Johnston HB, Schurmann A, Oliveras E, and Akhter HH** (2011) Scaled up and marginalized: a review of Bangladesh’s menstrual regulation programme and its impact. *Social Determinants Approaches to Public Health: From Concept to Practice*. Geneva: World Health Organization.
- Kant S, Srivastava R, Rai SK, Misra P, Charlette L, and Pandav CS** (2015) Induced abortion in villages of Ballabgarh HDSS: rates, trends, causes and determinants. *Reproductive Health* 12(1), 1–7.
- Kapil Ahmed M, Van Ginneken J, and Razzaque A** (2005) Factors associated with adolescent abortion in a rural area of Bangladesh. *Tropical Medicine & International Health* 10(2), 198–205.
- Khan HR, and Shaw E** (2011) Multilevel logistic regression analysis applied to binary contraceptive prevalence data. *Journal of Data Science* 9, 93–110.
- Khan MN, Islam MM, and Islam RM** (2022) Pattern of contraceptive use among reproductive-aged women with diabetes and/or hypertension: findings from Bangladesh Demographic and Health Survey. *BMC Women’s Health* 22(1), 230.
- Marie Stopes Bangladesh** (2021) Safe Abortion for Every Woman (SAFE). Retrieved March 20, 2022, from <https://www.mariestopes.org.bd/about/safe-abortion-for-every-woman-safe/>
- MFS** (2022) Facts about safe abortion. Retrieved July 2, 2022, from <https://www.doctorswithoutborders.org/what-we-do/medical-issues/safe-abortion>
- NIPORT and ICF** (2020) *Mitra and associates. Dhaka, Bangladesh: ICF International. Bangladesh Demographic and Health Survey 2017-18*, Dhaka, Bangladesh, and Rockville, Maryland, USA: NIPORT and ICF.
- O’Donnell O, O’Neill S, Van Ourti T, and Walsh B** (2016) Conindex: estimation of concentration indices. *The Stata Journal* 16(1), 112–138.
- Population control and family planning division** (1979) *Memo no. 5-14/ MCH-FP/Trg./M.R. Programme. Dacca: Government of the People’s Republic of Bangladesh.*

- Population Council Bangladesh** (1999) *Menstrual Regulation Past, Present, and Future Challenges*. Retrieved from <https://www.popcouncil.org/uploads/pdfs/banglapolicydialogue9.pdf>
- Rahman M, DaVanzo J, and Razzaque A** (2014) Pregnancy termination in Matlab, Bangladesh: maternal mortality risks associated with menstrual regulation and abortion. *International Perspectives on Sexual and Reproductive Health* **40**(3), 108–118.
- Rana J, Sen KK, Sultana T, Hossain MB, and Islam RM** (2019) Prevalence and determinants of menstrual regulation among ever-married women in Bangladesh: evidence from a national survey. *Reproductive Health* **16**(1), 1–9.
- Say L, Chou D, Gemmill A, . . . Alkema L** (2014) Global causes of maternal death: a WHO systematic analysis. *The Lancet Global Health* **2**(6), e323–e333.
- Singh S, Hossain A, Maddow-Zimet I, Vlassoff M, Bhuiyan HU, and Ingerick M** (2017) The incidence of menstrual regulation procedures and abortion in Bangladesh, 2014. *International Perspectives on Sexual and Reproductive Health* **43**(1), 1–11.
- Singh S, Remez L, Sedgh G, Kwok L, and Onda T** (2018) Abortion worldwide 2017: uneven progress and unequal access. *Population Studies* **37**(3), 433–444.
- Vlassoff M, Hossain A, Maddow-Zimet I, Singh S, and Bhuiyan HU** (2012) *Menstrual regulation and postabortion care in Bangladesh: factors associated with access to and quality of services*. New York: Guttmacher Institute.
- WHO** (2012) *Safe abortion: technical and policy guidance for health systems*, World Health Organization.
- WHO** (2022) Abortion. Retrieved July 2, 2022, from https://www.who.int/health-topics/abortion#tab=tab_1
- World Health Organization** (2020) World Health Organization BMI Classification. World Health Organization.

Cite this article: Kundu S (2023). Factors influencing menstrual regulation and its socioeconomic inequalities among ever-married women in Bangladesh: Findings from a nationwide cross-sectional survey. *Journal of Biosocial Science* **55**, 755–766. <https://doi.org/10.1017/S002193202200030X>