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Prevalence and Determinants of Adolescent Fertility: Analysis of 2014 Bangladesh Demographic Health Survey

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2020 No. 168

DEMOGRAPHIC AND HEALTH SURVEYS

August 2020

DHS Working Paper No. 168

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August 2020

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Acknowledgments: We would like to extend our heartfelt gratitude to ICF International and USAID for the opportunity to be part of the 2020 DHS Fellows Program. We are greatly indebted to our facilitators, Dr. Shireen Assaf and Ms. Christina Juan, for their guidance and patience during this process. Our reviewers, Christina Whang and Sara Riese at ICF, are appreciated for their valuable insights about this work. We are also grateful to our DHS Program co-fellows for their support, feedback, and humor. This has been an opportunity for growth, and we see ourselves as ambassadors of The DHS Program in Bangladesh and beyond. We also want to extend our gratitude to our institution, the Asian University for Women, for allowing us to participate in the 2020 DHS Fellows Program.

Editor: Diane Stoy
Document Production: Joan Wardell

This study was implemented with support from the United States Agency for International Development (USAID) through The DHS Program (#720-0AA-18C00083). The views expressed are those of the authors and do not necessarily reflect the views of USAID or the United States Government.

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Recommended citation:

Alam, Nazmul, Manir Hossain Mollah, and Sharin Shahjahan Naomi. 2020. *Prevalence and Determinants of Adolescent Fertility: Analysis of 2014 Bangladesh Demographic Health Survey.* DHS Working Paper No. 168. Rockville, Maryland, USA: ICF.

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ABSTRACT

Bangladesh has one of the highest rates of adolescent fertility in the world, which contributes to negative maternal health outcomes and population growth. This study was conducted to assess the prevalence and determinants of adolescent fertility in Bangladesh using data from the 2014 Bangladesh Demographic and Health Survey. For this study, 2,023 ever-married women age 15-19 were included in the analysis. This study was guided by a conceptual framework of the relationship of selected independent and intermediate variables to the dependent variable, which is adolescent fertility.

Overall, the adolescent fertility rate was 31%. Significantly higher odds of adolescent fertility were found among women in the Sylhet Division (adjusted odds ratio (AOR) = 3.0; 95% confidence interval (CI): 1.6–6.1) and the Chittagong Division (AOR = 1.8; 95% CI: 1.8–2.7) compared to the Barisal Region. Compared to women in the lowest wealth quintile, women in all other quintiles had lower odds of adolescent fertility, with the lowest odds found among women in the richest quintile (AOR = 0.3; 95% CI: 0.2–0.6). Women who married at age 14-17 had 60% lower odds of adolescent fertility compared to the women who married at age 10-13. A substantial proportion of married adolescents were either pregnant or had at least one child before their twentieth birthday. There are several modifiable factors such as marriage at early age, geographic inequality, and income inequalities, which can have significant influence on adolescent fertility in Bangladesh. Policies and interventions to address these factors can reduce adolescent fertility and help to achieve improved health, psychosocial wellbeing, and greater women's empowerment in Bangladesh.

Key words: adolescent fertility, geographic inequality, employment, contraception, determinants, Bangladesh

1 INTRODUCTION

Remarkable global progress has been made in reducing early marriage, adolescent fertility, and maternal mortality over the past few decades, although adolescent fertility remains a social and public health concern (Austrian et al. 2020; UNFPA 2015; Wang and Qiao 2020). The fact that every year approximately 12 million girls age 15-19 give birth in low- and middle-income countries is evidence of this grave concern (Darroch et al. 2016). Adolescent pregnancy and childbearing have deleterious consequences at individual, societal, and global levels (Alemayehu, Haidar, and Habte 2010; Birchall 2018). Adolescent motherhood hampers a girl's health, wellbeing, and educational progress, and also prevents her from realizing her full potential (Chen et al. 2007; Ganchimeg et al. 2014; Hossain et al. 2015; Islam and Gagnon 2014; Jaén-Sánchez et al. 2020).

Adolescent fertility is the consequence of complex relationships with multiple factors. Global studies have found that high pregnancy rates among adolescent girls are associated with lack of education, less decision making power in household and family planning, less reproductive knowledge, poverty, and the experience of early marriage (Acharya and Sureender 1996; Alemayehu, Haidar, and Habte 2010; Angeles, Guilkey, and Mroz 2005; Chen et al. 2007). The age difference between spouses is also an influential factor in determining early pregnancy (Barbieri, Hertrich, and Grieve 2005; MacQuarrie 2016). Adolescent fertility rates often are higher in countries where early marriage is prevalent (Cherry, Byers, and Dillon 2009; UNICEF 2016). Girls who marry at young ages are more likely to experience multiple pregnancies, recurrent miscarriage, termination of pregnancy, and delivery complications (King 2003). One-third of married teenage girls in Bangladesh become mothers or are pregnant by their 18th birthday (UNICEF 2016). Adolescent mothers in Bangladesh face the dual challenge of progressing through the stages of adolescence and also adapting to the maternal role.

Adolescent fertility has been a widely discussed issue in Bangladesh with the scientific literature highlighting the social, economic, and reproductive health consequences (Ferdousi 2014; Islam et al. 2017; Jisun 2016; Kamal 2012; Nahar and Min 2008). However, there has been limited progress because of inadequate attention from policymakers and lack of coordinated efforts by government, nongovernment, and community-based organizations (Islam et al. 2017). In the presence of strict laws against early marriage, the government's commitment remains vital in undertaking holistic approaches that promote social mobilization and other structural interventions including poverty alleviation, gender equity, and girls education that prevent early marriage and reduce the high rate of adolescent pregnancy in Bangladesh. Such approaches must be based on scientific insights and evidence.

Making further improvement in lowering adolescent pregnancy rates is a priority for Bangladesh in achieving the Sustainable Development Goals (SDG) targets such as Goal 3 on good health and wellbeing, and Goal 5 on gender equality of girls and women (Datta and Rabbany 2016). This study examines the factors associated with adolescent pregnancy by using data collected by the nationally representative 2014 Bangladesh Demographic Health Survey (BDHS). The analysis examines the influence of demographic, social, economic, and reproductive health factors and will enhance understanding of the role of determinants in adolescent fertility in Bangladesh. The study findings will provide an evidence base for modifiable factors that can guide interventions potentially to increase age at first birth and reduce adolescent fertility in Bangladesh.

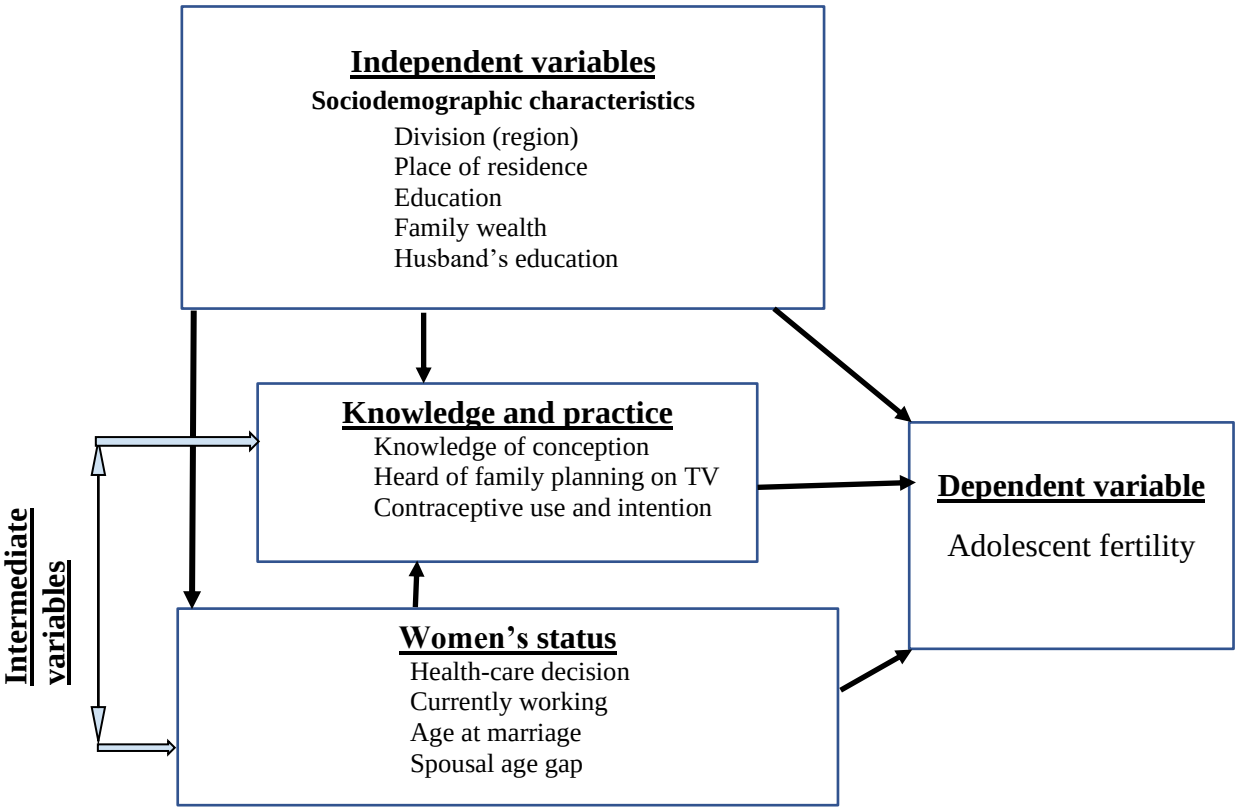
1.2 Research Questions

1. What is the level of adolescent fertility in Bangladesh?
2. What are the independent and intermediate factors that determine adolescent fertility in Bangladesh?

1.3 Conceptual Framework

The conceptual framework explains the relationship of sociodemographic factors (independent variables) that affect adolescent fertility through the intermediate variables (knowledge and practices related to reproductive health and women's status). Sociodemographic variables are typically nonmodifiable determinants, while the intermediate variables are generally modifiable. Independent variables influence the intermediate variables involved with adolescent fertility in a society. This conceptual framework aids in understanding how sociodemographic variables affect adolescent fertility. Data analyses and interpretation of the study findings have been guided by this conceptual framework to help understand the role of modifiable and nonmodifiable variables on adolescent fertility.

Figure 1 Conceptual framework that shows the linkages among the independent, intermediate, and dependent variables



2 DATA AND METHODS

2.1 Data

This study uses data from the 2014 BDHS, which is the seventh DHS survey conducted in Bangladesh. The survey provides information on fertility, contraception and family planning methods, maternal and child health, and community-level data on the accessibility and availability of health services. All ever-married women age 15-49 in the selected households were eligible to be interviewed. The survey was designed to produce representative results for the country, urban, and rural areas, and for each of the seven administrative divisions. Details about the survey methodology are available in the DHS final report (National Institute of Population Research Training, Mitra Associates, and ICF International 2016). The 2014 BDHS interviewed 17,863 women age 15-49. Our study sample included 2,023 ever-married women age 15-19.

2.2 Variables

2.2.1 Dependent variables

The dependent variable was adolescent fertility, defined as women age 15-19 who were pregnant or had at least one child at the time of interview. Applying all women factors as described below will allow this variable to be representative of all women and not only the ever-married women.

2.2.2 Independent variables

Independent and explanatory variables were: (a) sociodemographic characteristics of the woman and husband; (b) knowledge and practice; and (c) women's status. Sociodemographic characteristics included division (region), place of residence (urban/rural), family wealth quintile, and woman's and husband's education level (no education, incomplete primary, complete primary, incomplete secondary, complete secondary, and higher). Knowledge and practice variables included knowledge of conception, heard about family planning on television in the past few months, and contraceptive use and intention (uses modern method, traditional method, non-user but intends to use, and does not intend to use). Knowledge of conception was recoded as correct knowledge if the respondent answered that the fertile period is in the middle of the women's cycle and incorrect knowledge for any other answer. Variables that described the women's status included health-care decisions on women's health care (woman alone, woman and her husband jointly, husband alone, someone else, and other), working status (currently working or not), age at marriage, and spousal age gap.

2.3 Statistical Analysis

Descriptive analysis was used to assess the sociodemographic characteristics of the study population for the ever-married sample in the survey. The proportions of adolescent fertility by the background variables were estimated for all women by using all-women factors that are described below. Unadjusted and adjusted logistic regression models were fit to determine the factors associated with adolescent fertility. The adjusted multivariate logistic models were fit with adjustment of all the independent and intermediate variables except for the husband's education, which was found to be highly correlated with the woman's education.

P-values and 95% confidence intervals are reported to indicate the statistical significance of the odds ratios (OR).

The analysis considered the multistage sampling design of the survey and sampling weights. In addition, the "all-women factor" was used to adjust the sample weights in this ever-married women sample to make estimates for all women for all analyses except Table 1, which describes the variables among ever-married women. All-women factors are used for adjustments of sampling weight for each woman, multiplying the weight variable for the woman by her appropriate all-women factor to inflate the number of cases from the number of ever-married women to the number of all women. For this analysis, the regional all-women factor was used to consider the geographical distribution and to be consistent with using one all-women factor throughout the analysis.

2.4 Results

Among ever-married women age 15-19, the majority (74%) lived in rural areas (Table 1). Half of the study subjects had incomplete secondary education (50%), while only 5% of the respondents had no formal education. Only 16% of the adolescent women were working at the time of interview. More than three-quarters of the adolescent women (81%) had incorrect knowledge of conception. Close to half of the respondents (46%) reported using modern contraception methods, while 43% reported using no method but intent to use modern contraception to prevent pregnancy. Health-care decisions are made jointly by 40% of the adolescent women, while only 9% of women make health-care decisions alone. Approximately 17% of adolescent women married at age 10-13, and the majority (73%) married at age 14-17. Nearly half of the respondents (46%) had 6 to 10 years of age difference with their partners/husbands and about one-third (29%) had 10-plus years of age difference with their partners/husbands.

Table 1 Percent distribution of ever-married women age 15-19 according to background characteristics

Variables	%	Frequency
Division		
Barisal	6.9	279
Chittagong	19.8	356
Dhaka	34.1	339
Khulna	9.6	276
Rajshahi	11.2	270
Rangpur	12.1	295
Sylhet	6.3	208
Place of residence		
Urban	26.4	629
Rural	73.6	1,394
Education		
No education	5.1	105
Incomplete primary	14.9	281
Complete primary	11.8	236
Incomplete secondary	50.7	1,037
Complete secondary	8.3	171
Higher	9.2	193
Family wealth		
Lowest	19.8	391
Second	19.7	415
Middle	21.7	457
Fourth	22.6	458
Highest	16.1	302
Husband's education		
No education	14.0	282
Incomplete primary	17.4	354
Complete primary	16.0	315
Incomplete secondary	32.5	649
Complete secondary	9.1	176
Higher	10.9	247
Knowledge and practice		
Knowledge of conception		
No/incorrect knowledge	81.1	1640
Correct knowledge	18.9	383
Heard family planning on TV (N=2021)		
No	81.4	1,642
Yes	18.6	379
Contraceptive use and intention		
Using modern method	45.7	932
Using traditional method	4.3	85
Non-user - intends to use later	42.5	876
Does not intend to use	7.4	129
Non-user - intends to use later	0.1	1
Women's status		
Health-care decision (N=1981)		
Respondent alone	8.5	147
Respondent and husband/partner	40.3	760
Husband/partner alone	35.3	748
Someone else	15.4	315
Other	0.5	11
Currently working		
No	83.8	1,731
Yes	16.2	292
Age at marriage		
10-13	17.4	316
14-17	73.1	1,518
17-19	9.6	189

Spousal age gap (in years) (N=1,978)		
≤2	5.8	128
3-5	18.5	370
6-10	46.3	930
>10	29.4	550
Total	**100**	**2,023**

The adolescent fertility rate was found to be 31% among women, with 31% in rural areas and 30% in urban areas (Table 2). Adolescent fertility was higher in Rajshahi and Rangpur (37 percent each) compared with other divisions. Adolescent fertility was very similar across all education levels (between 30-34%), except for women with a higher education level who had an adolescent fertility rate of 26%. Adolescent fertility decreased with increasing family wealth as shown in Table 2. A large difference was observed in adolescent fertility among women who are currently using a modern contraceptive method (35%) and women who do not intend to use contraceptives (23%). There were also large differences by decision making for the women's health care. Adolescent fertility was higher when the woman and/or her husband were involved in the decision (32-35%) compared to decisions that were made by someone else or others (22% and 12%, respectively). Adolescent fertility was highest among women who had the smallest age gap with their husband (34% for women with 2 years or less) compared to 30% for women with a 6-10 age gap with their husband. There were small differences in adolescent fertility between the categories in the other variables and particularly having correct knowledge of contraception, heard of family planning on TV, working status, and age at marriage.

Table 2 Percentage of adolescent fertility by background characteristics adjusted with all women factors

Variables	%	95% C.I.
Total	30.8	29.1 - 32.5
Division		
Barisal	31.4	28.2 - 34.6
Chittagong	26.4	23.8 - 29.1
Dhaka	31.8	27.8 - 35.7
Khulna	31.2	27.5 - 35.0
Rajshahi	36.6	32.7 - 40.5
Rangpur	36.9	32.1 - 41.7
Sylhet	24.5	21.4 - 27.5
Place of residence		
Urban	29.5	26.1 - 33.0
Rural	31.2	29.3 - 33.2
Education		
No education	34.9	28.7 - 41.0
Incomplete primary	33.5	29.5 - 37.5
Complete primary	31.0	26.4 - 35.6
Incomplete secondary	30.1	27.7 - 32.5
Complete secondary	31.3	26.0 - 36.5
Higher	25.9	20.7 - 31.2
Family wealth		
Lowest	35.1	31.2 - 38.9
Second	32.2	28.8 - 35.6
Husband's education	30.0	26.6 - 33.5
No education	29.0	26.1 - 31.9
Highest	27.1	22.7 - 31.5
Husband's education		
No education	34.1	29.6 - 38.6
Incomplete primary	37.7	34.0 - 41.3
Complete primary	34.1	30.2 - 38.0
Knowledge and practice	27.3	24.5 - 30.1
Complete secondary	27.0	21.9 - 32.1
No/incorrect knowledge	23.9	20.0 - 27.8
Correct knowledge		
No/incorrect knowledge	30.3	28.3 - 32.3
Correct knowledge	33.3	29.7 - 37.0
Heard family planning on TV		
No	30.9	29.0 - 32.9
Yes	30.4	26.9 - 34.0
Contraceptive method use and intention		
Using modern method	34.6	32.2 - 36.9
Does not intend to use	21.2	14.5 - 27.9
Non-user - intends to use later	29.5	27.1 - 32.0
Women's status	22.8	16.3 - 29.2
Health-care decision		
Respondent alone	32.1	25.3 - 38.8
Respondent and husband/partner	34.7	32.3 - 37.1
Husband/partner alone	31.1	28.6 - 33.6
Someone else	22.9	19.2 - 26.7
Other	11.6	0.0 - 27.0
Currently working		
No	30.7	28.9 - 32.5
Yes	31.5	25.7 - 37.2
Age at marriage		
10-13	32.1	28.5 - 35.6
14-17	30.5	28.3 - 32.7
17-19	29.8	24.0 - 35.6
Spousal age gap (in years)		
≤2	34.4	28.1 - 40.7
3-5	30.5	26.7 - 34.4

6-10	29.6	27.1 - 32.1
>10	33.3	30.0 - 36.7

In the adjusted logistic models, we see that among the geographic divisions, the highest adjusted odds of adolescent fertility were found in the Sylhet Division (AOR = 3.0; 95% CI: 1.6–6.1) and in the Chittagong Division (AOR = 1.8; 95% CI: 1.8–2.7) when compared to the Barisal Division. Compared to women in lowest quintile, women in all other quintiles had lower odds of adolescent fertility, with the lowest odds found among women in richest quintiles (AOR = 0.3; 95% CI: 0.2–0.6). Women who married at age 14-17 had 60% lower odds of adolescent fertility and those who married at age 17-19 had 80% lower odds of adolescent fertility compared to women who married at age 10-13. Women who use traditional contraceptives had 70% lower odds of adolescent fertility, and women who do not intend to use contraceptives had 50% lower odds of adolescent fertility compared to women who use modern contraceptives. Women for whom decisions about their health care were made by someone else or others had lower odds of adolescent fertility compared to when the decision was made by the individual women. Place of residence, knowledge of contraception, heard of family planning on television, working status, and spousal age gap were not significant predictors of adolescent fertility both in the unadjusted and adjusted models.

Table 3 Unadjusted and adjusted logistic regression of adolescent fertility of ever-married women age 15-19 (n=1976)

Variables	UOR (95% CI)	p-value	AOR (95% CI)	p-value
Division				
Barisal	Reference category			
Chittagong	1.1 (0.8 - 1.6)	0.576	1.8 (1.8 - 2.7)	0.003**
Dhaka	1.2 (0.8 - 1.9)	0.326	1.5 (1.0 - 2.4)	0.068
Khulna	0.9 (0.6 - 1.3)	0.501	1.1 (0.7 - 1.6)	0.638
Rajshahi	1.3 (0.9 - 1.8)	0.221	1.2 (0.8 - 1.8)	0.366
Rangpur	1.4 (0.9 - 2.2)	0.171	1.3 (0.9 - 2.1)	0.192
Sylhet	2.3 (1.3 - 4.1)	0.006**	3.0 (1.6 - 6.1)	0.001**
Place of residence				
Urban	Reference category			
Rural	1.3 (0.9 - 1.8)	0.122	1.0 (0.7 - 1.6)	0.923
Education				
No education	Reference category			
Incomplete primary	1.0 (0.5 - 2.1)	0.990	1.2 (0.5 - 2.8)	0.617
Complete primary	0.8 (0.4 - 1.8)	0.650	1.0 (0.5 - 2.2)	0.952
Incomplete secondary	0.6 (0.3 - 1.1)	0.112	0.8 (0.4 - 1.7)	0.613
Complete secondary	0.5 (0.2 - 1.0)	0.044*	0.9 (0.4 - 1.9)	0.732
Higher	0.3 (0.1 - 0.5)	< 0.001***	0.6 (0.2 - 2.3)	0.161
Family wealth				
Lowest	Reference category			
Second	0.7 (0.4 - 1.1)	0.083	0.6 (0.4 - 1.0)	0.05*
Middle	0.6 (0.4 - 1.0)	0.029*	0.5 (0.3 - 0.9)	0.01**
Fourth	0.5 (0.4 - 0.8)	0.001**	0.5 (0.3 - 0.9)	0.013**
Highest	0.4 (0.2 - 0.6)	< 0.001***	0.3 (0.2 - 0.6)	< 0.001***
Knowledge of conception				
No/incorrect knowledge	Reference category			
Correct knowledge	1.0 (0.7 - 1.4)	0.928	1.2 (0.9 - 1.8)	0.248
Heard family planning on TV				
No	Reference category			
Yes	0.8 (0.6 - 1.1)	0.159	1.1 (0.7 – 1.5)	0.758
Contraception use or intention				
Use modern method	Reference category			
Use traditional methods	0.3 (0.2 - 0.6)	< 0.001***	0.3 (0.1.- 0.5)	< 0.001***
Intend to use later	0.8 (0.6 - 1.1)	0.209	0.9 (0.6 - 1.3)	0.504
No intention to use later	0.6 (0.3 - 1.0)	0.05*	0.5 (0.3 - 0.9)	0.031**
Health-care decision				
Respondent alone	Reference category			
Respondent and husband/partner	0.9 (0.5 - 1.5)	0.645	1.0 (0.6 - 1.6)	0.852
Husband/partner alone	0.9 (0.5 - 1.5)	0.570	0.9 (0.6 - 1.5)	0.754
Someone else	0.4 (0.2 - 0.7)	0.001**	0.4 (0.2 - 0.7)	0.001*
Other	0.1 (0.0 - 0.7)	0.023*	0.1 (0.0 - 0.6)	0.008**
Currently working				
No	Reference category			
Yes	0.7 (0.5 - 1.2)	0.195	0.7 (0.4 - 1.1)	0.124
Age at marriage				
10-13	Reference category			
14-17	0.4 (0.3 - 0.6)	< 0.001***	0.4 (0.3 - 0.7)	0.001**
17-19	0.2 (0.1 - 0.3)	< 0.001***	0.2 (0.1 - 0.4)	< 0.001***
Spousal age gap (in years)				
≤2	Reference category			
3-5	0.8 (0.5 - 1.3)	0.368	0.8 (0.5 - 1.4)	0.404
6-10	0.9 (0.6 - 1.5)	0.717	0.8 (0.5 - 1.3)	0.318
>10	1.4 (0.8 - 2.4)	0.229	1.3 (0.7 - 2.2)	0.397

*p<0.05, **p<0.01, ***p<0.0001

2.5 Discussion

Based on the analysis of 2014 BDHS data, the prevalence of adolescent fertility in Bangladesh is substantial. One-third of married adolescents were either pregnant or already had at least one child before their twentieth birthday, which is substantially higher than in other South Asian countries (Birchall 2018; Ganchimeg et al. 2014; Jisun 2016). Although considerable progress has been made, Bangladesh remains one of the leading countries in the world with high rates of teenage pregnancy. High prevalence of adolescent fertility is a hindrance for women's status in Bangladesh because of the negative consequences in health, as well as social and economic wellbeing. Four plausible explanations for high fertility among adolescents include early age at marriage, early first birth, low contraceptive use among teenagers, and short birth interval (Nahar and Min 2008).

Age at marriage was found to be a significant predictor of adolescent fertility in this study. Adolescent women who married at age 14-19 had significantly lower odds of adolescent fertility compared to the women who married at age 10-13. Bangladesh has some of the highest rates of child marriage worldwide, with more than half of all girls being married before the legal age of 18. Girls are often under pressure from both families to give birth to a child early in the marriage (Jaén-Sánchez et al. 2020). Although Bangladesh introduced a strict law against early marriage, progress has not been made over the years because it requires strong complementary social mobilization and other structural interventions that include poverty alleviation, gender equity, and an education program for girls (Shukrana 2020). Adolescent women have a lower contraceptive prevalence rate than other women and a higher unmet need for family planning. In 2014, the prevalence of contraceptive use by any method among adolescent girls age 15–19 was 51.2%, compared to 67.7% among women age 25–29 (Hossain et al. 2018; Islam et al. 2017).

Our study findings suggest that adolescent girls who belong to the richest quintile were significantly less likely to experience adolescent fertility. Income inequality is a growing source of concern globally. The disparity between rich and poor families has influenced overall adolescent health and adolescent fertility (Viner et al. 2017). Women from richer households are more likely to have better control over the decision to use contraception and are more aware of the consequences of early childbearing on their own and their children's health (Angeles, Guilkey, and Mroz 2005; Marchetta and Sahn 2016). Household wealth could also reflect greater access to media as a tool for better knowledge and awareness including the decision to use contraceptives and reduce adolescent fertility (Acharya and Sureender 1996; Islam and Hasan 2000; Rabbi 2012).

There were considerable variations in adolescent fertility rates across geographic divisions in Bangladesh. After adjusting for the effect of confounding variables, significantly higher odds of adolescent fertility were found in the Sylhet and Chittagong divisions compared to Barisal Region. These two divisions were reported as low-performing regions in Bangladesh in terms of contraceptive use and other maternal and reproductive health indicators (Hajizadeh, Alam, and Nandi 2014; Islam, Haque, and Hema 2020). The significant variations in adolescent fertility in these two divisions may be due to differences in the religious, cultural, and program coverage (Mollborn 2010; Rabbi 2012). The Government of Bangladesh has given due attention to reducing regional disparities in adolescent fertility by introducing regional family planning programs that target the low-performing areas.

This study has some limitations, which include using the 2014 BDHS data, which was collected with a cross-sectional survey. Causality cannot be ascertained for the predictors we discussed in our study findings. However, the DHS data had a large sample size and nationally representative sampling methodology, which increase the generalizability of our study findings. In addition, some unmeasured characteristics including parental socioeconomic status and cultural influences on fertility after marriage might have a systemic relationship with adolescent fertility in Bangladesh.

2.6 Conclusions

This study has provided insights on the magnitude and determinants of adolescent fertility in Bangladesh in terms of economic, social, and reproductive factors. This study highlighted that the adolescent girls from the richer wealth quintile had lower odds of fertility during their adolescent period. Age at marriage was found to be a significant determinant of adolescent fertility. To address the issues of regional disparity, family wealth inequality, and child marriage, it is paramount to strengthen structural interventions that target individual and societal level change, and raise awareness, poverty alleviation, girls' education and employment (WHO 2016). Bangladesh is one of the few developing countries that has achieved most of the Millennium Development Goals that include reducing poverty, increasing female education, and reducing gender inequality (Ahmed 2013; Datta and Rabbany 2016; United Nations 2015; UNPFA 2015). The study findings generated evidence that could be useful in formulating policies and interventions that address modifiable factors to reduce adolescent fertility and achieve improved health and psychosocial wellbeing for women in Bangladesh.

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