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SOCIO-ECONOMIC AND DEMOGRAPHIC FACTORS INFLUENCING FERTILITY PREFERENCE IN BANGLADESH: EVIDENCE FROM BDHS 2007-2018

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ABSTRACT
Understanding women's desire to have more children is critical for planning future reproductive health behavior. We examined the association between socioeconomic and demographic factors and fertility preferences among women of reproductive age in Bangladesh demographic and health survey 2007 to 2018. The analysis suggested that approximately 52.9% women of reproductive age in Bangladesh desired more children data from the Bangladesh Demographic and Health Surveys conducted between 2007 to 2018. Age, residence, religion, highest education level, wealth index, partners education, total number of children ever born, number of living children, currently pregnant and division were found to be significantly associated with fertility preference. We found that the percentage of people who want to get a child is 32.3, and those who don't want a child is 33. This study concluded that women whose age is lower than 20 these women are more likely to desire more children. On the other hand, women in rural tend to prefer more children.

Keywords: BDHS, fertility preference, logistic regression

INTRODUCTION
Bangladesh, the eighth-most populous country in the world, has been concerned with rapid population growth for a long time. The country is one of the most congested countries in South Asia, with a population of 167.9 million people BBS (2018). Bangladesh has experienced a high level of fertility in the previous years, and it has been declining over the years. According to UNFPA (2022) fertility rate has declined from a total fertility rate (TFR) of 5.6 in 1985, to 3.8 in 1995, to 2.1 in 2017, to 1.95 in 2022. But still there is a long way to go. Bangladesh faces various socioeconomic and health related problems because of its rapid population growth. One of the main concerns of policymakers is to identify the socio-economic and demographic factors influencing fertility rates in Bangladesh to manage its population size.

There are several socio-economic and demographic factors influencing the fertility rates in Bangladesh. The study by Akmam (2002) showed that religion, unemployment, place of residence, geographic location, wealth index, maternal age, maternal education, partners' education and experiencing child death are major factors affecting fertility preferences in Bangladesh. Nahar *et al*. (2019) found that being illiterate, primary school graduate, having no access to mass media, giving the first birth at the age of 15 years or earlier and using any contraceptive ever, are the factors determining fertility preference. Alam *et al*. (2018) showed that regional variation, women's empowerment, fertility control knowledge, family planning attitude, social influence, perceived behavioral control are the important indicators for fertility preference among the people of

Bangladesh. According to Islam *et al*. (2003), increased induced abortion, contraception and marriage pattern are the main factors determining the fertility preferences among Bangladeshi people. Another study (Ahmed *et al*. 2007)) has shown that factors like death of last child, gender preference, abortions, couples' educational level, mother's participation in labor force are important for fertility preference in Bangladeshi couples. Mother's age plays a vital role on fertility preference as well, according to the author. A study by Islam *et al*. (2010) showed that age, family income, educational status, number of surviving children, number of desired children, sex preferences, contraceptive use, family planning, and residence were linked with the fertility preference of a household. On the contrary, the study by Islam *et al*. (2003) showed that characteristics like education, occupation, religion, residence have no effect on fertility in Sylhet and Chittagong.

So far, there has been very few studies (Khan *et al*. 2010 and Rabbi *et al*. 2014)) on the fertility preference of Bangladeshi people specifically on the varying roles of socio economic and demographic factors in determining the fertility preference. This article explores the socio-economic and demographic factors determining the fertility preference in Bangladesh.

MATERIALS AND METHODS

Data Source

We use Bangladesh Demographic and Health Survey (BDHS) from 2007 to 2017 to describe the trends of fertility preference of women and investigate its determinants. The BDHS is a large household survey sponsored by the Demographic and Health Surveys Program. Details of the methodology and sampling procedure of BDHS were published. The individual-level data of women from BDHS 2007-2017 were used, which contained information regarding different aspects, for instance, fertility, mortality, and nutrition, of women aged 15 years and above. Our study mainly focuses on the fertility preference of women; therefore, we restrict our analysis to women in the reproductive span (15-49 years). In total we have information about 66,845 women.

Outcome variable

The outcome variable for the study is the fertility preferences of women and derive from a question- "would you like to have an (another) child with your husband/partner, or would you prefer not to have any more children with him?" answered by women aged 15–49 from 2007 to 2017. Responses are categorized into: "want an (another) child," "want no more," "cannot get pregnant," "undecided," and "don't know." Our outcome variable was computed from two of these responses, namely "want an (another) child," coded as 1 and "want no more," coded as 0. Women who respond as "undecided" and "don't know" are excluded from the study because their responses are unclear about their fertility preference. Further, those who indicate "cannot get pregnant" are excluded since they are not at risk of getting pregnant.

Explanatory variable

We consider education and wealth status as indicators of socioeconomic status. The education of the women and their partners was included, categorized into no education, primary, secondary, and higher. The wealth quintile is measured as an ordinal variable ranging from poorest to richest. We also consider important socio-demographic characteristics of the women: age, residence, occupation, region, ethnicity, parity, religion, the total number of living children, currently pregnant and access to mass media (newspaper/ magazine, radio and television).

Statistical analyses

Descriptive statistics of each of the selected covariates and the distribution of women's fertility preferences were shown by adjusting the sampling weight of the surveys. Pearson's chi-squared tests are performed to determine the statistical association between the women's fertility preference and the selected covariates. We used a p-value of ≤ 0.05 as a criterion to include covariates in the multivariable model. As our outcome variable, fertility preference, is binary, and therefore, the Logistic regression model was fitted to the data to identify the determinants of fertility preferences. The results of the multivariate logistic regression analyses have been presented as odds ratios (OR) with 95% confidence intervals. All the analyses are performed using R Studio (version 4.1.3) and SPSS (version 20).

Ethics statements

Our study is exempted from the ethical review approval because we use publicly available de-identified data.

RESULTS AND DISCUSSIONS

Table 1 illustrates the trends in fertility preference of women aged 15-49 years in Bangladesh from 2007 through 2017. The percentage of women aged 15-49 who want to have another child was 33.6% in 2007, which increased to about 35% in 2011 and remained in the vicinity of 33% between 2014 to 2018. Overall, during 2007-17, this percentage remains around 33%.

Table 1. Percentage distribution of respondents to variables

Variables	Survey year				
	2007 (N=10996)	**2011 (N=17842)**	**2014 (N=17863)**	**2017-18 (N=20123)**	**pooled data (N=66845)**
Fertility preferences					
Yes	33.6%	34.7%	31%	33.8%	33.2%
Age (in years)					
<20	13.0%	11.1%	11.3%	10.6%	11.2%
≥ 20	87.0%	88.9%	88.7%	89.4%	88.8%
Residence (participants)					
Urban	22.6%	26%	21.9%	25.0%	26.8%
Rural	77.4%	74%	78.1%	75.0%	73.2%
Religion					
Muslim	91.0%	90.0%	90.9%	91.2%	90.4%
Hinduism	8.1%	9.5%	6.5%	8.0%	8.7%
Other	0.9%	0.5%	2.6%	0.8%	.9%
Highest Education Level (participants)					
No Education	34.1%	27.7%	30.5%	4.9%	21.6%
Primary	29.7%	30.0%	27.7%	27.0%	29.7%
Secondary	30.4%	35.0%	35.3%	59.7%	40.1%
Higher	5.9%	7.3%	6.6%	8.3%	8.6%
Wealth Index					
Poorest	19.2%	18.3%	23.2%	16.2%	18.4%
Poorer	19.6%	19.6%	18.7%	18.7%	19.3%

Middle	19.9%	20.1%	21.7%	20.8%	20.0%
Richer	20.5%	20.6%	18.9%	21.4%	20.8%
Richest	20.7%	21.3%	17.5%	22.9%	21.4%
Partners Education					
No	35.6%	31.2%	32.1%	15.8%	27.6%
Primary	26.3%	27.1%	27.4%	32.1%	28.5%
Secondary	25.9%	28.2%	29.2%	35.2%	29.5%
Higher	12.1%	13.6%	11.3%	16.9%	14.4%
					Table 1. continued
Unemployed	2.8%	3.6%	3.2%	1.9%	2.9%
Employed	97.2%	96.4%	96.8%	98.1%	97.1%
Number of living children					
0	11.0%	10.5%	9.0%	10.9%	10.5%
1-2	46.8%	50.1%	53.4%	53.2%	51.4%
>2	42.2%	39.4%	37.7%	35.9%	38.1%
Currently pregnant					
No	93.6%	94%	93.9%	94.3%	94.0%
Yes	6.4%	6.0%	6.1%	5.7%	6.0%
Division					
Barisal	6.0%	5.6%	3.0%	2.7%	5.8%
Chittagong	18.4%	18.2%	15.4%	19.3%	18.2%
Dhaka	31.2%	32.3%	58.1%	36.9%	30.7%
Khulna	12.7%	12.0%	4.7%	9.2%	11.6%
Rajshahi	25.2%	14.9%	6.2%	13.6%	15.5%
Rangpur	-	11.5%	9.1%	10.4%	9.7%
Sylhet	6.4%	5.4%	3.5%	2.9%	6.1%
Mymensingh	-	-	-	5.0%	2.3%

Determinants of fertility preferences in reproductive age of women

We carried out a multivariate logistic regression analysis to examine the influence of socio-economic and demographic variables on the fertility preference (desire for one or more children). The estimates of the determinants of fertility preference of women aged 15-49 years are presented as odds ratio (ORs) together with their corresponding 95% confidence intervals in Table 2.

Table 2. Odds ratios of fertility preference among women in Bangladesh

Variables	**Odds Ratio (95% C.I) & Std. Error**				
	2007 (N=10996)	**2011 (N=17863)**	**2014 (N=17863)**	**2017-18 (N=20123)**	**pooled data (N=66845)**
Age (Years)					
<20	4.80**	4.849**	4.849**	7.564**	6.000**
	0.098	0.075	0.075	0.085	0.041
≥ 20	[REF]				
Residence (participants)					
Urban	0.740**	0.912	0.912	0.980	0.899**
	0.069	0.056	0.056	0.048	0.025
Rural	[REF]	[REF]	[REF]	[REF]	[REF]

Religion					
Muslim	0.478*	2.125**	2.125**	1.835*	1.867**
	0.360	0.172	0.172	0.226	0.132
				Table 2. continued	
Hinduism	0.333*	1.293	1.293	1.067	1.159**
	0.370	0.187	0.187	0.235	0.137
Other	[REF]	[REF]	[REF]	[REF]	[REF]
Highest Education Level (participants)					
No Education	1.324**	1.196**	1.196**	1.654	1.318**
	0.143	0.111	0.111	0.557	0.057
Primary	1.618**	1.334**	1.334**	1.766	1.544**
	0.131	0.096	0.096	0.535	0.050
Secondary	1.828	1.546**	1.546**	1.722*	1.713**
	0.114	0.082	0.082	0.119	0.043
Higher	[REF]	[REF]	[REF]	[REF]	[REF]
Wealth Index					
Poorest	1.458**	1.710**	1.710**	0.991	1.405**
	0.119	0.092	0.092	0.074	0.044
Poorer	1.290*	1.459**	1.459**	1.010	1.257**
	0.109	0.085	0.085	0.070	0.41
Middle	1.495**	1.440**	1.440**	1.031	1.259**
	0.102	0.078	0.078	0.067	0.038
Richer	1.316**	1.244**	1.244**	1.041	1.204**
	0.091	0.069	0.069	0.065	0.035
Richest	[REF]	[REF]	[REF]	[REF]	[REF]
Partners Education					
No	1.228	1.311**	1.311**	1.133	1.158**
	0.122	0.095	0.095	0.087	0.048
Primary	1.209	1.676**	1.676**	1.086	1.242**
	0.113	0.084	0.084	0.074	0.043
Secondary	1.118	1.491**	1.491**	1.057	1.168**
	0.101	0.075	0.075	0.069	0.038
Higher	[REF]	[REF]	[REF]	[REF]	[REF]
Partners Occupation					
Unemployed	0.998	0.977	0.977	0.702*	0.938
	0.169	0.131	0.131	0.153	0.071
Employed	[REF]	[REF]	[REF]	[REF]	[REF]
Number of living children					
≤ 2	6.056**	5.618**	5.618**	22.375**	16.172**
	0.131	0.131	0.131	0.76	0.044
>2	[REF]	[REF]	[REF]	[REF]	[REF]
Currently pregnant					
No	6.103**	4.598**	4.598**	6.205**	5.022**
	0.135	0.103	0.103	0.111	0.055
Yes	[REF]	[REF]	[REF]	[REF]	[REF]

Division					
Barisal	0.410**	0.490**	0.490**	0.678	0.670**
	0.116	0.126	0.126	0.545	0.074
Chittagong	0.599**	0.813*	0.813*	1.160	1.053
	0.108	0.104	0.104	0.528	0.072

Table 2 continued-

Dhaka	0.478**	0.533**	0.533**	0.969	0.760**
	0.104	0.097	0.097	0.528	0.071
Khulna	0.306**	0.297**	0.297**	0.608	0.471**
	0.111	0.113	0.113	0.521	0.72
Rajshahi	0.278**	0.315**	0.315**	0.642**	0.522**
	0.109	0.110	0.110	0.093	0.070
Sylhet	[REF]	0.327**	0.327**	0.706**	0.588**
		0.111	0.111	0.105	0.073
Rangpur	-	[REF]	[REF]	1.607**	1.583**
				0.187	0.75
Mymensingh	-	-	-	[REF]	[REF]
Survey Year					
DHS 2007	-	-	-	-	[REF]
DHS 2011	-	-	-	-	0.676**
DHS 2014	-	-	-	-	0.677**
DHS 2017-18	-	-	-	-	0.800**

The estimates of the determinants of fertility preference among married women are presented in the form of odds ratios in Table 2. From Pooled analysis, it is observed that mother's age less than 20 years are (6-1) = 5 folds more prone to have another child than mother's age greater than 20 years. Further, the mother's from rural have more chance of having another child (odds ratio = 0.89) compared with mother's from urban. Mothers' education does play a statistically significant role in the fertility preference. For instance, the odds of preference to have another child are 69% lower for mothers with higher educated mothers than uneducated mothers. Again, the odds of preference to have another child are 54% and 71% higher for mothers with primary and secondary education than highly educated mothers. Compared to the mothers from the richest income families, the odds of fertility preference is 40% and 26% lower for the mothers from lowest families and middle-class families, respectively. Among the division, Sylhet's risk of fertility preference is relatively lower (odds ratio = 0.588) than Mymensingh.

Fertility preference has a noteworthy function during the demographic transition of a country; for developing country this role becomes very important for policy implication regarding population strategy too. The timing of the next parity progression also has a significant role in fertility scenario of a country. Investigation of the determinants of fertility preference of Bangladesh suggests that the effect of family size does not play vital role in case of next parity progression; while next parity

depends mainly on gender preference, history of any terminated abortion and husband's desire for another child. This is also confirmed from the study by Islam *et al*. (2003). Also, fertility preference and desired waiting time both are independent of socio-economic status. Similar finding can be observed from Rabbi (2014). Furthermore, more research into the potential influence of partners and family on young women's fertility preference formation and change may aid policymakers in better understanding the underlying process of fertility preference formation and change.

CONCLUSION

The study utilized data from the Bangladesh Demographic and Health Surveys conducted in 2007, 2011, 2014, and 2017-18 to investigate the factors affecting fertility preference among Bangladeshi women. The findings revealed several significant associations. For instance, women under 20 were more likely to desire more children. Women belonging to the Hindu and other religions showed lower fertility preferences compared to those following Islam. Rural women had a higher inclination to desire more children. Women with no children ever born exhibited higher fertility preferences. Women with no living children had a stronger desire for more children. Currently, pregnant women show lower fertility preferences compared to non-pregnant women. The Sylhet division demonstrated higher fertility preferences compared to other divisions. Over time, there was a decreasing trend in fertility preferences during the survey years (2011, 2014, and 2017-18) compared to 2007. The study suggested that factors such as increasing female education, women's involvement in the labour force, women's empowerment, and improved information dissemination may have influenced fertility preferences in Bangladesh. Notably, Bangladesh has made significant progress in achieving Millennium Development Goals, including poverty reduction, female education, and gender equality, which might have shaped fertility preferences in the country.

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