


**Research Article**

## Factors Influencing the Number of Children Born to Working Women in Bangladesh: A Population-Based Study

Md. Rashed Alam<sup>1</sup>, Md. Aminur Rahman<sup>1</sup>, Yothin Sawangdee<sup>2\*</sup>

### Abstract

**Background:** The satisfaction of external jobs and education, which can be substituted for those of child-rearing, have a significant impact on women's working status, which is inversely associated with fertility. The aim of this study is to find out the factors influencing the number of children of working women.

**Methods:** This study examined a total of 18861 working women in Bangladesh, using a nationally representative survey. This study considered working women and the number of children as the dependent variable and various respondents and their husband education, age at first marriage, wealth index, contraceptive use, place of residence and religion were considered as the independent variable. Multiple classification analysis with the number of children is the dependent variable and a set of independent variables was used to determine the influential factors on working women.

**Results:** The number of children is most influenced by the respondent's education and another influence is the age of the first marriage and wealth index. Rural women have greater fertility than urban women, and Muslim respondents had a higher number of births than non-Muslim respondents. The number of children is significantly negative effects on both respondents and their husband education, age at first marriage and wealth index in both three models.

**Conclusion:** Greater involvement of women in working/employment/labor force is not the main reason for fertility decline in Bangladesh. These findings illustrate how important it is to consider women's education, husband education, age at first marriage and wealth index should be influential factors of the number of children of working women. Finally, it may conclude that improving the educational status of both wife and husband and reducing early marriage and same time marriageable age should be increased for both males and females.

**Keywords:** Fertility, Working women, Multiple classifications, Analysis and Bangladesh

### Introduction

The global fertility rate has decreased from 3.2 live births per woman in 1990 to 2.5 in 2019 [1] while Bangladesh has seen a dramatic fertility decline over the last 45 years, with fertility dropping to 2.028 births per woman in 2019 from 6.3 births per woman in 1975. Although some researchers claim that the decline is due to the successful implementation of a government family planning program, others argue that the demand for contraception

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was already there due to the country's socioeconomic situation and that family planning programs have only helped meet that demand [2]. Working position is one of the main socioeconomic elements that is always expected to influence a woman's birth performance since it allows her to be liberated from the traditional roles of wife and mother [3]. Working women's economic journey in Bangladesh displays not only their poverty but also their cultural and social costumes regarding the separation of all forms of public connection [4]. The status of working women in society is crucial to the social organization's standards. Bangladesh's constitution discriminates on the basis of religion, gender, and place of residence, and as a result, women are generally protected from discrimination. However, only a small percentage of Bangladeshi women use their constitutional rights and benefits [5]. Women are typically deprived in all elements of their lives in Bangladeshi culture, including food sharing, education, work, independent thinking, parental property, choice, and decision-making [6]. Working women's fertility varies a lot depending on where they work. It has been demonstrated in the literature that fertility and women's employment evaluations are finished equally [7]. This shows that a set of external factors influence both work and fertility, resulting in a woman's greater social position. On the other hand, if unfavorable variables affect jobs and fertility in the reverse direction, the impact of employment on fertility will be less unequal [8]. The study conducted by Matysiak & Vignoli [9] demonstrates the link between a woman's employment status and fertility, as well as the reality of the negative influence of a woman's employment status on pregnancy and vice versa. This study also found a link between a woman's job position and childbirth having a detrimental impact on mothers who are well-educated and have a successful careers. Another key issue is that mothers' opportunity costs are higher in terms of education or career advancement than childless women's conditions superior in the labor market after motherhood makes women more vulnerable and reduces their negotiating control at home and job market odds [10].

Women have made up roughly 47% of the world's employees over the previous fifty years, with a growing number of women in poor and middle-income countries, particularly in the agricultural, industrial, and service sectors [11,12]. Significant changes in the global reproductive system, including lower total fertility rates (TFRs) and higher contraceptive prevalence rates (CPRs), have occurred within similar time periods across the majority of the world's major regions [13,14]. The negative relationship between women's wage employment and fertility in developing and less developing countries has been well documented [15-19], while some evidence has emerged in recent decades due to the adoption of policies for employment and family conflict resolution in those countries [20]. In poor and middle-income nations, Bongaarts and his colleagues discovered a negative link between having children at home and women's

employment, with the findings varying by country and type of employment [21]. There have been fewer studies on employment and fertility in less developed and emerging countries than in developed ones, owing to the enormity of the situation and the wide diversity of forms of jobs available [22]. As a result of the discussion above, the purpose of this study was to determine which factors influence the number of children of working women in Bangladesh.

## Methods

### Data source and sample

The Bangladesh Demographic and Health Survey (BDHS), a nationally representative household-based survey performed in 2017–2018, provided the data for this study (BDHS, 2017). In the 2017–2018 BDHS, a two-stage sampling design was adopted. 675 primary sampling units (PSU) were created in the first stage (urban areas: 250; rural areas: 425). The PSU was created using data from the 2011 Bangladeshi census [23]. Each PSU was assigned a systematic sample of 30 households on average in the second stage. A total of 20,250 residential households were initially selected among them 6,810 in urban areas and 13,440 in rural areas and finally 20,108 were originated to be engaged (response rate of 99.29%). To eliminate bias, no substitutions or changes to the pre-selected households were allowed. The sample was expected to complete the interviews of about 20,127 ever-married women age 15–49 years among them 7,374 in urban areas and 12,753 in rural areas and for every division all over Bangladesh. Finally, we considered 18,851 currently working women out of 20,127 (91.96%) included from 675 clusters distributed across the country. The data collection procedure is aided by NIPORT and is funded by the US Agency for International Development (USAID) with contributions from other donors (UNICEF, UNFPA, and WHO).

Bangladesh is divided into eight divisions, each of which is measured to determine the analytical variation in the CEB of currently employed women. Participants' socio-demographic profiles, family structure, and pregnancy-related information are among the survey data collected [24]. Bangladesh administrative level 1 (i.e., division-level) shapefile was taken from [https://gadm.org/download\\_country\\_v3.html](https://gadm.org/download_country_v3.html) (accessed on July 27, 2021), which is freely available for academic and other non-commercial use. The shapefile was delivered using R version 4.0.5 [25], package sf [26], and the maps were generated using R package tmap [27] following MCA analysis [28].

## Measures

### Dependent variable

The dependent variable in this study was the total number of children ever born. We only included women between the ages of 15 and 49 who were presently employed.

## Explanatory variables

The explanatory variables were chosen based on two criteria: (1) they were available in the DHS survey and (2) previous research had established them as important determinants of the number of children born to women [29-33]. The following variables were considered: place of residence (rural versus urban), women and their partner's educational level (illiterate, primary, secondary or higher), religion (Muslims versus non-Muslims), wealth index (poorest, poorer, middle, richer or richest), age at first cohabitation (below 18 years, 18-29 years or 30 years and above), and contraceptive use (no versus yes).

## Statistical Analyses

For the women based on their working status, descriptive statistics were reported as mean, frequency, and standard error of the mean. The bivariate correlation (Zero-order correlation coefficient) was used to examine the relationship between our dependent and chosen socio-demographic factors. Finally, for the highest-ranking influential factor on the number of children of working women, multiple classification analysis<sup>28</sup> was utilized. These three models are referred to as the overall model, currently working model, and not currently working model. SPSS software version 16 was used to conduct all of the analyses.

## Results

Table 1 displays the summary of statistics of the occupational categories of children ever born in Bangladesh according to BDHS 2017. The respondents who were farmers had the highest birth and each woman gave birth to an average of 3.16 children (SE: 0.086), fisherman, poultry and cattle raising, and hand-based manufacturers each woman provided birth to an average of 2.81 children (SE: 0.02) is the second-highest, factory workers and domestic servant each woman gave birth of 2.51 children (SE: 0.046) and doctor, engineer, first and second class job holder women were the lowest birth and each woman gave birth to an average of 1.45 children (SE: 0.048), women who are business each woman gives birth 2.25 children (SE: 0.087) and students and unemployment each woman gave birth to an average of 2.67 children (SE: 0.31).

The correlation coefficient of working women and the number of births by selected characteristics are presented in Table 2. We observed that place of residence and contraceptive use are significantly positively associated with the number of children while respondent education, husband education, wealth index, religion, and age at first cohabitation are negatively significantly associated with the number of children of working women of the overall model. This table revealed that respondents' education, husband's education, wealth index, religion, and age at first cohabitation are all negatively associated with working women's fertility. We found that respondents' location of residence, education, wealth index, and contraceptive use are all positively associated with the number of children; however, husband education, religion, and age at first cohabitation are all negatively associated with the fertility of nonworking women.

Table 3 shows the ranking of the influencing factors on the number of children and working women based on selected attributes using Multiple Classification Analysis (MCA). The first biggest influencing factor on the number of children in the overall ( $\eta = 0.454$  and  $\beta = 0.409$ ), currently working ( $\eta = 0.438$  and  $\beta = 0.393$ ), and not working ( $\eta = 0.438$  and  $\beta = 0.413$ ) model. In the overall model, the mean numbers of children (adjusted) for no education, primary, secondary, and higher education respondents are 3.64, 2.83, 1.93, and 1.32, respectively. For the currently working women model, the mean numbers of children (adjusted) for no education, primary, secondary, and higher education respondents are 3.72, 2.96, 2.11, and 1.47 and for the not working women model the corresponding rate is 3.42, 2.66, 1.83, and 1.26 respectively.

The second most influential factor was husband education in overall ( $\eta = 0.329$  and  $\beta = 0.088$ ), currently working ( $\eta = 0.308$  and  $\beta = 0.064$ ) and not working ( $\eta = 0.309$  and  $\beta = 0.103$ ) model. The mean numbers of children (adjusted) for no education, primary, secondary, and higher educated respondents are 3.22, 2.55, 2.03, and 1.66 in the overall model, 3.31, 2.73, 2.29 and 1.79 respectively in currently working and 3.07, 2.36, 1.85 and 1.60 respectively not working women model.

Age at first marriage was the third strongest influential

**Table 1:** Mean and standard error of the number of children by various categories of respondent occupation, BDHS 2017.

Occupation and their categories	Number of case	Mean and SE of the mean
Farmer	325	3.16 (0.086)
Non-agriculture worker (fisherman, poultry and cattle raising, and hand-based manufacture )	6541	2.81(0.020)
Physical Workers (factory workers and domestic servants ( )	1402	2.51 (0.046)
Small service holder (driver, constable, construction supervisor, tailor)	1080	1.96 (0.040)
Big service holder (Doctor, engineer, first and second class job holder)	431	1.45 (0.048)
Businessman	342	2.25 (0.087)
Others (students and unemployment	12	2.67 (0.310)

**Table 2:** Zero-order correlation coefficient of the number of children and various selected socio-demographic variables of working women

		Total Children ever born	Place of Residence	Respondent education status	Husband educational status	Wealth index	Religion	Age at marriage	Contraceptive use
Overall Working not working	Total Children ever born	1.00	.092**	-.438**	-.311**	-.162**	-.052**	-.197**	.121**
			0.113**	-0.419**	-0.290**	-.173**	-0.064**	-0.188**	0.091**
			.044**	0.427**	-0.291**	0.094**	-0.054**	-0.183**	0.127**
Overall Working not working	Place of Residence	1.00		-.136**	-.166**	-.432**	.009	-.109**	-.042**
				-0.093**	-0.116**	-.384**	0.035**	-0.101**	-0.004
				-0.142**	-0.175**	-.451**	-0.025*	-0.096**	-0.091**
Overall Working not working	Respondent education status	1.00			.618**	.395**	.030**	.285**	.019**
					0.596**	0.358**	0.038**	0.272**	0.045**
					0.614**	0.381**	0.038**	0.276**	0.024*
Overall Working not working	Husband educational status	1.00				0.452**	0.042**	0.252**	-0.003
						0.415**	0.070**	0.244**	0.007
						0.437**	0.033**	0.235**	0.019
Overall Working not working	Wealth index	1.00					-0.026**	0.202**	-0.027**
							-0.038**	0.186**	-0.029**
							0.006**	0.184**	0.009
Overall Working not working	Religion	1.00						0.125**	0.055**
								0.144**	0.048**
								0.119**	0.055**
Overall Working not working	Age at marriage	1.00							-0.029**
									-0.019
									-0.022**
Overall Working not working	Contraceptive use	1.00							1.00

factor on the number of children in the overall ( $\eta = 0.20$  and  $\beta = 0.078$ ), currently working ( $\eta = 0.191$  and  $\beta = 0.075$ ) and not working ( $\eta = 0.183$  and  $\beta = 0.074$ ) women model. The mean numbers of children (adjusted) for married below age 17 years, married between age 18-29 years and married age 30 years above are 2.45, 2.17 and 2.09 respectively in the overall, 2.72, 2.43 and 2.28 is currently working and 2.32, 1.70 and 1.40 is not working women model respectively. The fourth important influential factor was the wealth index on the number of children in overall ( $\eta = 0.166$  and  $\beta = 0.07$ ), currently working ( $\eta = 0.177$  and  $\beta = 0.022$ ) and currently not working ( $\eta = 0.156$  and  $\beta = 0.128$ ) model. The mean numbers of children (adjusted) for poorest, poorer, middle, richer, and richest respondents are 2.74, 2.59, 2.39, 2.26, and 1.98 respectively in the overall model, 2.96, 2.83, 2.64, 2.47, and 2.08 is currently working and 2.53, 2.39, 2.27, 2.15 and 2.10 respectively not working women model.

Contraceptive use of the respondents was the fifth strongest influential factor on the number of children in the overall model ( $\eta = 0.132$  and  $\beta = 0.123$ ), sixth influential factors in the currently working women model ( $\eta = 0.086$  and  $\beta = 0.093$ ) and again fifth influential factors of currently not working women model ( $\eta = 0.143$  and  $\beta = 0.135$ ). The mean numbers of children (adjusted) for not using and using respondents are 2.10 and 2.54 in the overall model, 2.45 and 2.76 is currently working and 1.86 and 2.32 respectively

not working women model. Place of residence is another influential factor on the number of children in the overall ( $\eta = 0.091$  and  $\beta = 0.059$ ), currently working ( $\eta = 0.108$  and  $\beta = 0.074$ ) and currently not working ( $\eta = 0.043$  and  $\beta = 0.043$ ) model. The mean numbers of children (adjusted) for urban and rural respondents are 2.18 and 2.49 in the overall model, 2.39 and 2.77 respectively in currently working and 2.05 and 2.19 respectively currently not working women model. The last influential factor is religion on the number of children in the overall ( $\eta = 0.057$  and  $\beta = 0.037$ ), currently working ( $\eta = 0.073$  and  $\beta = 0.049$ ) and not working ( $\eta = 0.058$  and  $\beta = 0.036$ ) model. The mean numbers of children (adjusted) for Muslims and non-Muslim's respondents are 2.41 and 2.10 in the overall model, 2.70 and 2.33 respectively in currently working and 2.16 and 1.83 respectively currently not working women model.

Geographically in Bangladesh respondents' education of working women is the highest fertility influential factor (0.497) in Rangpur division and lowest in Mymensingh division (0.426) and the same times highest educational rate in Dhaka division (14.8) and lowest (10.8) in Mymensingh division. We observed that not working women of the study highest fertility influential factor (0.482) in Rangpur division and lowest Mymensingh division (0.376) and the education rate (18.1) highest in Chittagong division and lowest (7.9) in Rangpur division. The important model of working women

**Table 3:** Ranking of the influencing factors of the number of children of working women using Multiple Classification Analysis

Variables with category	Overall					Working women					Not working women				
	No. of case N	Predicted Mean		Factors Summary		No. of case N	Predicted Mean		Factors Summary		No. of case N	Predicted Mean		Factors Summary	
		Adjusted	Un adjusted	Eta	Beta adjusted for Factors		Adjusted	Un adjusted	Eta	Beta adjusted for Factors		Adjusted	Unadjusted	Eta	Beta adjusted for Factors
<b>Place of Residence</b>															
Urban	6870	2.18	2.25	0.091	0.059	2676	2.39	2.47	0.108	0.074	4194	2.05	2.05	0.043	0.043
Rural	11981	2.49	2.45			6216	2.77	2.74			5765	2.19	2.19		
<b>Respondent educational Status</b>															
No education	2790	3.64	3.52			1713	3.72	3.63			1077	3.52	3.42		
Primary	5901	2.83	2.79			3176	2.96	2.93			2725	2.63	2.66		
Secondary	7430	1.93	1.96	0.454	0.409	3043	2.11	2.14	0.438	0.393	4387	1.80	1.83	0.438	0.413
Higher	2730	1.32	1.44			960	1.47	1.67			1770	1.23	1.26		
<b>Partners educational Status</b>															
No education	3976	3.22	2.62			2447	3.31	2.81			1529	3.07	2.46		
Primary	5923	2.55	2.38			3026	2.73	2.63			2897	2.36	2.17		
Secondary	5579	2.03	2.22	0.329	0.088	2309	2.29	2.53	0.308	0.064	3270	1.85	1.97	0.309	0.103
Higher	3373	1.66	2.34			1110	1.79	2.66			2263	1.60	2.10		
<b>Wealth Index</b>															
Poorest	3539	2.74	2.24			2171	2.96	2.62			3022	2.68	1.83		
Poorer	3592	2.59	2.29			2071	2.83	2.63			1368	2.39	1.93		
Middle	3645	2.39	2.34			1812	2.64	2.67			1521	2.27	2.03		
Richer	3846	2.26	2.41	0.166	0.070	1631	2.47	2.68	0.177	0.022	1833	2.15	2.17	0.097	0.128
Richest	4229	1.98	2.56			1207	2.08	2.72			2215	2.10	2.39		
<b>Religion</b>															
Muslims	16972	2.41	2.40	0.057	0.037	7882	2.70	2.68	0.073	0.049	9090	2.16	2.18	0.058	0.036
Non-Muslims	1879	2.10	2.20			1010	2.33	2.43			869	1.83	1.94		
<b>Age at marriage</b>															
Below age 17 years	13870	2.57	2.45			6976	2.82	2.72			6894	2.32	2.21		
18-29 Years	4920	1.84	2.17	0.200	0.078	1880	2.08	2.43	0.191	0.075	3040	1.70	1.95	0.183	0.074
30 years and above	61	1.51	2.09			36	1.58	2.28			25	1.40	1.87		
<b>Contraceptive uses</b>															
No	7019	2.10	2.12	0.132	0.123	2827	2.45	2.44	0.086	0.093	4192	1.86	1.88	0.143	0.135
Yes	11832	2.54	2.53			6065	2.75	2.76			5767	2.32	2.31		
Grand Mean: 2.38 Model Goodness of Fit: 0.238 Case Processing Summary: 93.68%						Grand Mean: 2.66 Model Goodness of Fit: 0.466 Case Processing Summary: 92.3%					Grand Mean: 2.13 Model Goodness of Fit: 0.233 Case Processing Summary: 94.9%				

of the study highest fertility influential factors (0.470) in Rangpur division and lowest (0.414) in Mymensingh division and the educational rate (15.9) in Khulna division is the highest and (7.5) in Sylhet division is the lowest.

### Discussion

Using nationally representative data, we used multiple classification analyses to look at the socio-economic determinants that influence the number of children (fertility) in currently working women in Bangladesh. The findings demonstrated that the respondents' education had the greatest

impact on the number of children in the overall, working and nonworking model. Generally, educated women have fewer children, although it is crucial to note that in many nations where fertility declines but women are not well educated, this phenomenon appears at all levels of education, albeit it is most apparent among highly educated women [34]. These are the divisive findings of these investigations. However, in three models, the educational status of respondents had a considerable negative impact on the number of children.

For three models, the education of the respondent's husband is the second most impactful factor on the number

of children. Working women and illiterate husbands have roughly double the number of births as responders who are not working and whose partners are more educated. When compared to non-working women, illiterate husbands and spouses have a higher number of children. Husbands and women with no or primary education, on the other hand, had much more children than husbands with secondary or higher education. Education of the husband had a moderately strong and negative significant effect on fertility, while education of the woman had a moderately strong and negative significant effect on fertility. For spouses and wives with primary education, the number of children reduces dramatically. Previous research in Bangladesh [35], Italy and Poland [9], Western Europe [16], and Zimbabwe [36] showed comparable findings.

Marriage is an important social custom, particularly in Bangladesh, where men and women cannot keep in sex without marrying. Cohabitation (age at first marriage) is a significant demographic event that affects births, deaths, and the health of women and their children [37]. According to our findings, age at first marriage (age at first cohabitation) is the third most important factor in determining the number of children for working and nonworking women, as well as across the three models. Women who marry before the age of 17 have a higher number of children than women who marry between the ages of 18 and 29, while women who marry after the age of 30 have the lowest number of children. According to previous research, Bangladesh has one of the highest rates of early marriage in the world [38,39], with more than 30% of first weddings occurring within two years after menarche [40] and 52% of females marrying before turning 18 [41,42]. However, we discovered in our study that women who do not work have the lowest fertility. It could happen as a result of a working woman's job classification.

Demographers and economists have long debated the relationship between wealth indicators and fertility. Poorer countries have higher population growth, and poorer people have larger family sizes, according to widespread experimental findings. In this study, the wealth index is the fourth most important factor in determining the number of children for all women, working and nonworking women, and across the three models. The poorest have a higher number of births than the middle, then the rich, and the richest have the lowest number of births. Surprisingly, the wealthiest women had lower fertility than those who do not work. The similar result showed in several other studies [44-47].

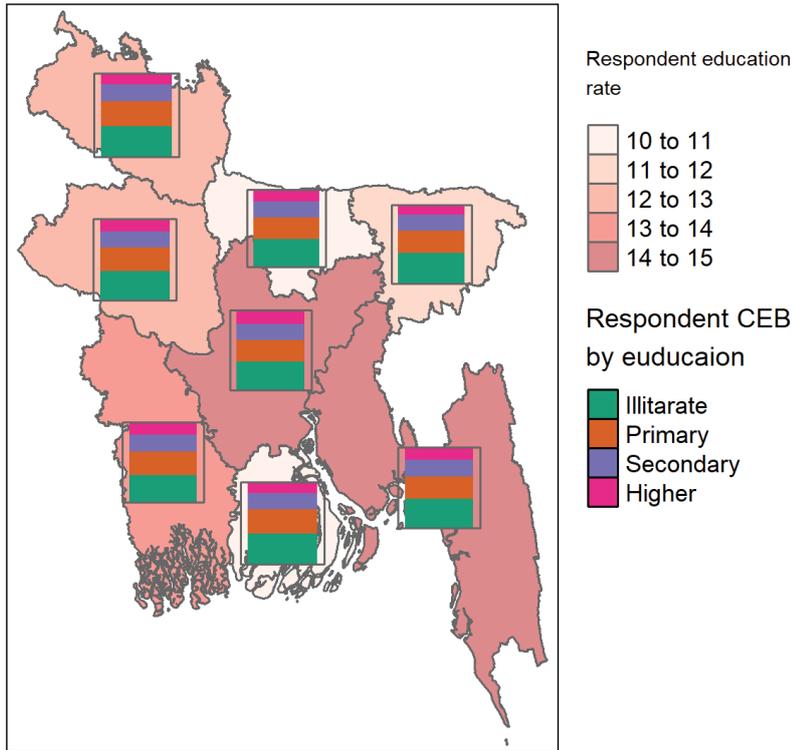
According to the findings, women who used contraceptives had higher fertility than those who did not use any contraceptive techniques. The number of births among nonworking women is lower than that of working women. This is the contentious result of this and preceding research. The location of one's dwelling is a significant socio-

demographic variable. The majority of people resided in rural areas, and the majority of women were illiterate. In this study, we discovered that women who reside in rural areas have higher fertility than women who live in urban areas. Studies [48,49] produced similar results. Religion is the final factor that influences the number of children. Bangladesh is a Muslim-majority country, with Muslims accounting for roughly 90% of the population. In general, Muslim women have more children, and this study found the same outcome.

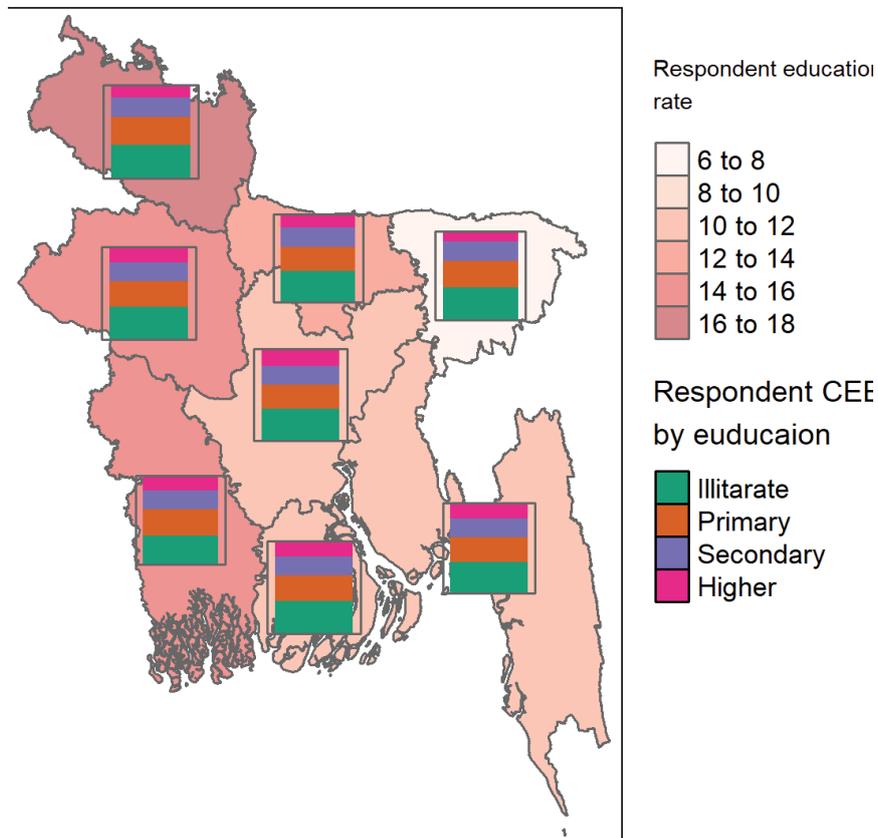
The study is primarily concerned with the factors that influence women who are attempting to conceive. The study's findings revealed that women's educational status has the greatest influence on working women's fertility. As a result, women's educational status is geographically presented in eight divisions of Bangladesh, with the overall model in Figure 1, working women in Figure 2, and not working women in Figure 3 to reveal the true situation of working women and their fertility in Bangladesh. This is the first study of divisional level analysis of women's educational status and fertility by employment status using spatial mapping in Bangladesh, to the best of our knowledge. Illiterate women in the Khulna division have the lowest fertility while working women in Sylhet have the highest fertility. In the higher education sector, we found that the higher education level Sylhet division has the lowest fertility, while the Chittagong division has the highest. Mymensingh has the lowest overall women's education rate, whereas Dhaka has the highest. Women with primary education in the Mymensingh division have the lowest fertility, while women with secondary education in Barisal and Sylhet have the highest fertility. The lowest fertility areas are Rajshahi and Rangpur, whereas the greatest fertility area is Sylhet. The fertility of illiterate, primary, and secondary educated women in the Khulna division is the lowest, whereas working women in Sylhet have the highest fertility. Higher educated women's fertility was lowest in the Rangpur division and greatest in the Chittagong division. Women's education rates are lowest in Sylhet and highest in Khulna.

## Conclusion

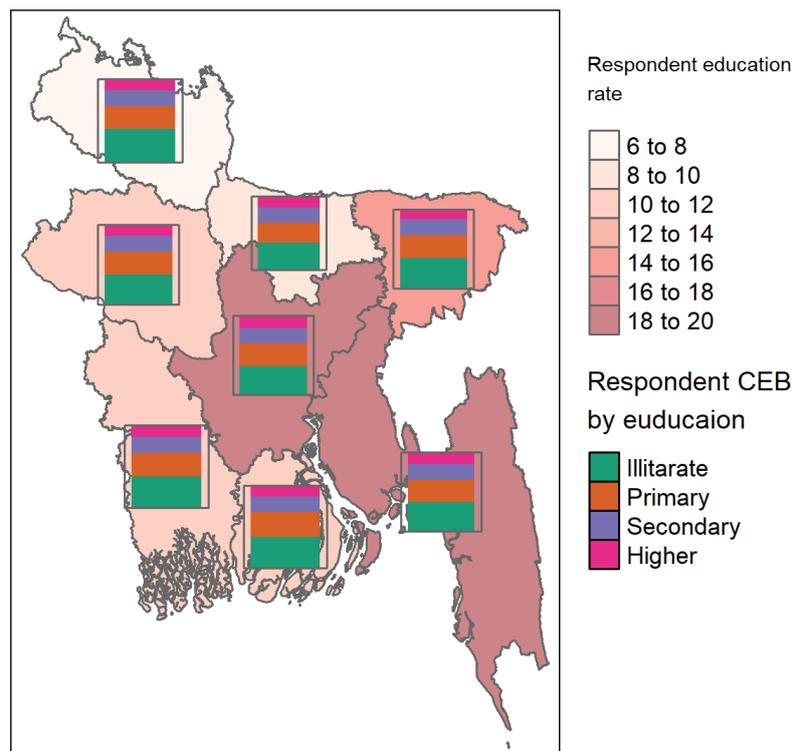
In conclusion, among all of the socio-economic parameters studied, the respondent's education is the first and most powerful factor influencing the number of children born to working and non-working women. Women who are illiterate or have no education have more children than educated working women, with the number of children being highest in the Sylhet division. The respondent's husband's degree is the second influencing element, which has a significant impact on the number of children of working women. Mymensingh has the lowest overall education rate, whereas Dhaka has the highest. Working women's children are influenced by their age at first marriage, which is the third most important factor. Finally, it may be concluded that in order to improve both



**Figure 1:** Observed respondent education rate in Bangladesh, 2017.  
Each bar chart represents division-wise children ever born (CEB) according to respondent educational status.



**Figure 2:** Observed respondent education rate of working women in Bangladesh, 2017.  
Each bar chart represents division-wise children ever born (CEB) according to respondent educational status.



**Figure 3: Observed respondent education rate of not-working women in Bangladesh, 2017.**

Each bar chart represents division-wise children ever born (CEB) according to respondent educational status.

women's and men's educational standing, compulsory formal education up to the secondary level should be provided, as well as some sort of non-formal education. Marriageable age must be set, with females being 18 years old and males being 22 years old, as determined by the government.

### Author Declarations

Ethics approval and consent to participate

We confirm all relevant ethical guidelines have been followed, and any necessary IRB and/or ethics committee approvals have been obtained.

This research analyzed secondary data extracted from the Demographic and Health Survey Program. The institutional review board of the demographic and health survey and government of Bangladesh reviewed and approved this study. No additional ethical approval was required to conduct this study.

I confirm that all necessary patient/participant consent has been obtained and the appropriate institutional forms have been archived.

### Disclosure statement

No potential conflicts of interest relevant to this article were reported by the authors.

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### Authors' contributions

MRA developed the study concepts. MRA and MAR analyzed the data. MRA drafted the manuscript. MRA, MAR and YS critically reviewed the manuscript. All authors have read and approved the final version of the paper.

### Data availability

The datasets used and analyzed in this study are available from the Measure DHS website: <https://dhsprogram.com/data/available-datasets.cfm>

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**Supplementary Table 1:** Respondents' educational status and educational rate and their categories of Overall model.

Division	Illiterate	Primary	Secondary	Higher	Eta	Model	Educational Rate
Barisal	3.81	3.07	2.02	1.47	0.48	0.27	10.7
Chittagong	3.94	3	2.18	1.71	0.463	0.263	14.4
Dhaka	3.32	2.5	1.82	1.56	0.456	0.263	14.8
Khulna	3.01	2.56	1.81	1.39	0.455	0.248	13.1
Mymensingh	3.56	2.67	2.07	1.5	0.426	0.219	10.8
Rajshahi	3.15	2.53	1.78	1.36	0.472	0.265	12.8
Rangpur	3.44	2.82	1.89	1.32	0.497	0.29	12.4
Sylhet	4.15	3.1	2.24	1.32	0.441	0.249	11.1

**Supplementary Table 2:** Respondents' educational status and Educational Rate and their categories of working women.

Division	Illiterate	Primary	Secondary	Higher	Eta	Model	Educational Rate
Barisal	4.04	3.27	2.34	1.91	0.456	0.249	10.1
Chittagong	4.24	3.25	2.5	2.15	0.445	0.27	10.4
Dhaka	3.43	2.55	1.99	1.84	0.452	0.308	11.1
Khulna	2.94	2.67	1.94	1.53	0.423	0.217	15.9
Mymensingh	3.85	2.95	2.38	1.67	0.414	0.194	12.5
Rajshahi	3.34	2.65	1.92	1.66	0.463	0.256	15.3
Rangpur	3.5	2.98	2.04	1.38	0.47	2.62	17.2
Sylhet	4.3	3.38	2.54	1.26	0.425	0.229	7.5

**Supplementary Table 3:** Respondents' educational status and Educational Rate and their categories of not working women.

Division	Illiterate	Primary	Secondary	Higher	Eta	Model	Educational Rate
Barisal	3.52	2.89	1.78	1.21	0.47	0.266	11.3
Chittagong	3.7	2.87	2.05	1.51	0.432	0.242	18.1
Dhaka	3.24	2.51	1.74	1.43	0.439	0.241	18.1
Khulna	3.21	2.37	1.64	1.22	0.476	0.276	10.5
Mymensingh	3.08	2.27	1.76	1.22	0.376	0.217	9.2
Rajshahi	2.99	2.33	1.62	1.11	0.442	0.25	10.5
Rangpur	3.37	2.38	1.62	1.17	0.482	0.297	7.9
Sylhet	4.11	2.98	2.13	1.26	0.436	0.259	14.4