

Determinants of age at first motherhood in Bangladesh

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Abstract

Female's age at first motherhood is an important determinant of fertility process, which also indicates the status of female in a society. In this research, an attempt has been made to evaluate the female's age to give their first birth as well as its significant covariates by utilizing the data extracted from 2011 Bangladesh Demographic and Health Survey (BDHS). Univariate, bivariate, and multivariate Cox proportional hazard model have been used to identify the association between age at first motherhood and selected background variables. The average age at first motherhood of this study is found to be only 17.92 years. Median age at first motherhood is close to the mean age at 17 years. The study shows that age at first cohabitation is significantly negatively correlated with the timing of first motherhood, while the age at first cohabitation is positively correlated with age at first motherhood. In bivariate analysis, all independent variables are strongly associated with age at first motherhood. The findings of multivariate analysis indicate that age at first cohabitation, spousal age difference, ever use of any method, respondents' current age, and respondents' education are found to be the significant covariates of age at first motherhood in Bangladesh.

Keywords Age at first motherhood, Covariates, Bivariate, Cox proportional hazard, Bangladesh

Paper type Research paper

1. Introduction

The average age at first motherhood is defined as the average completed years of age of women when their first child is born. Both researchers and the community health personnel have an enormous interest in the 'mean' age of respondent's while they have a child, particularly their first baby. The respondent's age at first mother affects total amount of births that she might have in her conjugal life, which has an impression on the size, composition, and future enlargement of the



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residents (Mathews & Hamilton, 2009). Early childbearing negatively associate with health of mother and infant and financial benefit of the family (Coombs & Freedman, 1970). Early pregnancies are significantly associated with bad prenatal health care and vaccination activities, inferior birth weights, former weaning and particularly during the next year of life and higher rate of death (LeGrand & Mback'e, 1993).

Khan and Reside (1998) elicited that mother's education has a significant influence on her childbearing than the education of her partner and Non-Muslim counterparts have a lower risk in moving towards the subsequent birth than their Muslims Community. Respondents in Chittagong region have an upper risk of having a first child in both city and countryside areas when compared to the Dhaka division. Educational status of a woman has a significant impact on childbearing. Women who have no education are more likely to start childbearing at an early stage. Findings of Trussell and Reinis (1989) suggest that rural and poor urban women would maintain more to usual birth spacing patterns that develop the extensive birth intervals and thus decrease fertility. In contrast, higher graduate women are more likely to start childbearing at later ages and also likely to break the conventional patterns of early marriage. Women who have higher education and the job are more likely to postpone marriage at an early age and also childbearing within marriage. These discussions are well supported by Weinberger, Llody and Blanc (1989) in the studies conducted in Latin America. He also observed that education is an essential socio-economic variable which has a greater connection with occupational discrimination and social mobility, both can influence marriage and reproductive behaviour of women. Education of women has a positive relation with age at first child (Maxwell, 1987). The composite effect of education regarding entry into motherhood of adolescent women's has been studied (Lappegard & Ronsen, 2005). In a study of education and age at first birth, Gaisie (1984) found that women with secondary or tertiary education have a lower median age at first birth (25 years) with compare to women who have secondary and primary school levels (19 years). The above thought is established by similar studies in Kenya conducted by Lomba (1985). He found that above primary schooling educated women (mainly, 9+) has a strong influence to postpone the onset fertility often by 3 to 4 years. Many demographers are concerned about first birth at an early age. Women, who have an early first birth, tend to have higher number of births than those women whose first birth occurs lately regardless of birth cohort (Erfani & McQuillan, 2008). Some studies suggest that along with education, place of residence and wealth index have an impact on the first birth of women. Moreover,

the effect of employment was also observed in previous studies (Kirsten, 1987). The above discussions suggest that the proposition of different determinants come into prominence at different parities.

In most of the previous studies, there is a large portion of literature focusing on how background characteristics affect the age at first birth. The purpose of the current study is to determine the female's age to give their first delivery as well as its significant covariates. Considering the importance of these covariates, we are studying age at first cohabitation, timing of first motherhood and age at first motherhood among married women in Bangladesh.

2. Objectives of the research

The specific goals of the research work are as follows:

- i. To compute the mean age at first motherhood of sampled women as well as to investigate its significant covariates in Bangladesh;
- ii. To examine whether there is any significant association between age at first motherhood and available background characteristics of the respondents;
- iii. To estimate the risk factor of age at first motherhood by employing Cox's proportional hazard regression analysis;
- iv. To find the Pearsonian correlation coefficient between age at first cohabitation and timing of first motherhood and also with women age at first birth.

3. Data and methodology

The study is designed by the analysis of Bangladesh Demographic and Health survey data (BDHS, 2011) which operate under the authority of the National Institute of Population Research and Training (NIPORT) of the Ministry of Health and Welfare, Bangladesh and financed by USAID. It is a nationwide representative survey designed to make available information on social mobility including fertility, early death, contraceptive prevalence, maternal and babies health, nutritional status of mothers and baby, consciousness of AIDS and domestic hostility. A total of 17842 women aged 12-49 were interviewed. Stratified Multi-stage Cluster Sampling procedure is used to collect data. To identify the determinants of age at first motherhood among women in Bangladesh, we have extracted 15916 women out of 17842 women from the 2011 Bangladesh Demographic and Health Survey (BDHS). Out of 17842 respondents, 1817 were excluded because they have zero parity at the time of interview.

The cross-tabulation analysis is an important method for finding the relationship between ages at first motherhood with relevant properties. Though, such analysis failure to address age at first motherhood completely because of ignoring censored cases. Hence, Cox's proportional hazard model has also been employed to estimate autonomous effects of each variable while controlled for others. This investigation has measured all the parameter that have found significant in cross-tabulation method.

4. Definition of variables

4.1 Dependent variable

The dependent variable for this analysis is Age at first motherhood. The variable can be computed in the following way:

Age at first motherhood = (Age at first cohabitation)+(Timing of first motherhood/12).

Where the variable timing of first motherhood is obtained by subtracting age at first marriage (Censoring month code, i.e. CMC) from date of first birth (CMC)

4.2 Explanatory variables

This study includes the several important explanatory variables. However, some of the variables with their original coding can be used for the analysis of the data. On the other hand, we re-code some of the variables instead of their original coding for the convenience of the analysis. We also assign new code of some independent variables for the purpose of the easiest analysis of the data in which the coding of the variables are not available. The newly recoded variables are age at first marriage, respondents' education, partners' education, respondents' currently working, religion, partner's occupation, ever use of any contraceptive method and socio-economic status. The independent variable spousal age difference is calculated by subtracting women age from husbands' age. The variables, type of place of residence instead of their original co-ding and region are recoded same as the original coding. Finally, twelve explanatory variables are included and examined in this study. The percentage distributions of the respondents' aforementioned variables are given in Table 1.

5. Results and discussions

5.1 Characteristics of respondents

Table 1 gives the outline of the dependent variable age at first

motherhood by independent variables. Among the variables considered current age of the mother is one of the essential variables in our analysis. In this study current age of the women is receiving in 5-yearly age groups. This study covered, the regions of Bangladesh are Barisal, Chittagong, Dhaka, Khulna, Rajshahi, Rangpur and Sylhet. Our analysis shows that 11.6 percent respondents are from Barisal division, 16.2 percent from Chittagong, 17.0 percent from Dhaka 14.9 percent from Khulna, 14.5 percent from Rajshahi, 14.1 percent from Rangpur and 11.6 percent respondents are from Sylhet division. The greater part of the respondents lived in rural areas (65.6%). Table 1 indicates that most of the respondents are Muslim (88.7%). Regarding of the respondents' education, it is found that illiterate respondents are 28.9%, while the comfortable figures for primary, secondary and higher educated are 31.4%, 33.9%, and 5.8% respectively. In this study, 36.6 percent respondent' belongs to the poor stratum, 19.2 percent respondents' wealth index is middle and 44.2 percent respondents' wealth index is high. Table 1 also shows that 38.5 percent of respondents never use any contraceptive method at the time of the interview, 61.5 percent of them used any of the contraceptive methods. Husband education is also recorded same as the respondent education level. This study states that 31.4 percent husband are illiterate, 27 percent husband are primary educated and 28.8 percent are secondary educated, and only 12.8 percent respondents' husband are highly educated. In this study, occupation of husband has been classified into four categories- Agriculture, Business, Service and others. The distribution of respondents shows a small proportion of women are found currently working (13.4%). In the present study 23.2 percent respondent's spousal age difference is less than 6 years, 38.6 percent spousal respondent's age difference is between 6 to 10 years and 38.2 percent spousal respondent's age difference is at 11 years and above. However, early age at first marriage among girls mainly in the rural areas and polygamy may be the important causes for higher spousal age difference in Bangladesh. From the figures in the last column of table 1, we have observed that age at first cohabitation is higher in the age less than 14 years (41.6%).

6. Average age at first motherhood by background characteristics

Table 1 also represents average age at first motherhood by assigned background characteristics. The average age at first birth differs by background characteristics of the respondents. Our analysis shows that the overall mean age at first birth in Bangladesh is 17.92 ± 3.32 years, which is undoubtedly lower than expected. The result regarding age at first motherhood gives us the depressing scenario in Bangladesh.

Table 1: Mean age at first motherhood of the respondents by background characteristics

Background Characteristics	Mean	S.D	N	%
Age of respondents				
=<19 years	16.08	1.484	1036	6.5
20-24	17.39	2.313	2964	18.6
25-29	17.78	2.984	3203	20.1
30-34	18.20	3.546	2604	16.4
35-39	18.30	3.742	2231	14.0
40-44	18.38	3.857	2090	13.1
45-49	18.70	3.927	1788	11.2
Region				
Barisal	17.90	3.108	1850	11.6
Chittagong	18.05	2.971	2582	16.2
Dhaka	18.01	3.497	2709	17.0
Khulna	17.67	3.262	2371	14.9
Rajshahi	17.73	3.465	2315	14.5
Rangpur	17.34	3.177	2239	14.1
Sylhet	18.89	3.566	1850	11.6
Type of place of residents				
Rural	17.67	3.089	10437	65.6
Urban	18.39	3.681	5479	34.4
Religion				
Muslim	17.80	3.272	14118	88.7
Non Muslim	18.89	3.547	1798	11.3
Respondents education				
Illiterate	17.17	3.228	4592	28.9
Primary	17.42	2.882	4993	31.4
Secondary	18.21	2.917	5402	33.9
Higher	22.71	3.981	929	5.8
Socio economic status				
Poor	17.36	3.058	5829	36.6
Middle	17.46	2.865	3055	19.2
Rich	18.59	3.587	7032	44.2
Ever use of any method				
Not use	18.15	3.518	6125	38.5
Use any method	17.78	3.185	9791	61.5
Husbands education				
Illiterate	17.28	3.029	4993	31.4
Primary	17.36	2.958	4300	27.0
Secondary	18.04	3.047	4578	28.8
Higher	20.40	4.062	2045	12.8
Partners occupation				
Agriculture	17.38	3.056	4139	26.0
Business	18.17	3.355	3621	22.8
Service	17.60	3.048	2216	13.9
others	18.26	3.515	5940	37.3
Respondents currently working				
Not working	17.82	3.173	13785	86.6
Working	18.58	4.100	2131	13.4
Spousal age difference				

Table 1: *Continued ...*

Background Characteristics	Mean	S.D	N	%
< 6 years	18.80	3.708	3691	23.2
6-10	17.77	3.099	6143	38.6
10+	17.54	3.195	6082	38.2
Age at first marriage				
=<14 years	15.93	2.461	6622	41.6
15-17	18.02	2.153	6061	38.1
=>18	21.81	3.160	3233	20.3
Bangladesh	17.92	3.32	15916	100
Median= 17.00 years, Minimum = 11 years, Maximum = 40 years, $\beta_1=1.314$, $\beta_2 = 2.901$				

Source: 2011 BDHS (Bangladesh Demographic and Health Survey), NIPORT, Dhaka

Minimum age at motherhood is as low as 11 years and maximum is 40 years. Median is close to the mean age at 17 years. The mean age at first motherhood is even lower than legal age at first marriage (18 years) of females in Bangladesh. The mean age at first birth is lower among the younger women than older cohort. The mean age at first birth is 16.08 years for women aged less than 19 years and the same is 18.70 years for women aged 45 to 49 years. The variation in the mean age at first motherhood is also observed with respect to the region of the respondents'. Mean age at first birth is lowest in the new Rangpur division (17.34 years) and highest in the Sylhet division (18.89 years). The differentials of age at first motherhood are found to be pronounced in case of type of place of residence. The rural-urban differential also displays that the mean age at first motherhood is highest in the city areas (18.39 years) as compared to their rural sisters (17.67 years). Age at first motherhood is large among women residing in urban areas than women in rural parts. The mean age at motherhood varies by religious affiliation. Our present analysis reveals that non-Muslim women give their first birth later (18.89 years) than their Muslim counterparts (17.67 years).

Education of women plays a most important role in determining the age at first motherhood. The mean age at first motherhood is highest in higher educated women (22.71 years). The differences in age at first motherhood comparing illiterate and higher education are 5.54 years. The findings regarding educational levels and age at first motherhood are positively associated. The mean age at first motherhood is 18.59 years belongs to high socio-economic class, while it is found lower (17.36 years) among the respondents of low socio-economic group. Poor people tend to lower mean age at first birth than people in middle and rich classes. We also found that the women who are ever users, the mean age at first

motherhood is lower (17.78 years) than those who did not use any method (18.15 years).

Husbands' education shows a clear relationship between education level and age at first motherhood. The mean age at first motherhood among the women whose husbands are higher educated is 20.40 years. While it is about 3 years lower among the respondents, who have no formal education. The women whose husbands are service holders, their mean age first motherhood is 17.60 years and it is lowest (17.38 years) among those whose husbands are agriculturist. Respondents who are currently working their mean age at first motherhood are higher (18.58 years) than those who are not working (17.82 years). The women whose spousal age difference is 0 to 5 years, their mean age at first motherhood is 18.80 years and it is lower (17.54 years) among those whose spousal age difference is 11 years and above. It is seen from the Table 1 that as the age at first marriage increases the mean age at first motherhood also increases. Among the women who get married before age 15 years, their average age at first motherhood is only 15.93 years. When the age at first cohabitation rises to 15 to 17 years, the average age at first birth rises 15.93 to 18.02 years. Similarly, the average age at first birth increases to 21.81 years when the age at first marriage increases to 18 years and above. Thus, it can be concluded that there is a positive association between age at first cohabitation and age at first motherhood. The shape characteristics of the age at first motherhood are found to be asymmetrical. The values of β_1 (1.31) and β_2 (2.90) indicate that the distribution of age at first motherhood is positively skewed and platykurtic.

7. Bivariate analysis of age at first motherhood

In this analysis, the dependent variable, "Age at first motherhood" is categorized into two groups, i.e. one is, below or equal to median age at first motherhood (17 years) and the other after median age at first motherhood. The test of independent between age at first motherhood and background characteristics of respondents are performed, and values of χ^2 test statistics along with p values are shown in Table 2. From the Table 2, it is seen that all independent variables are highly significantly associated with age at first motherhood. This illustrates that there is a significant association between age at first motherhood and selected background characteristics considered in this research task.

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Table 2: Test of independence between age at first parenthood and background characteristics of the respondents

Background variables	Age at first motherhood	
	≤ 17 years	>17 years
Age of respondents	$\chi^2 = 400.01^{***}$	
= <19 years	80.5(834)	19.5(202)
20-24	52.5(1556)	47.5(1408)
25-29	52.0(1664)	48.0(1539)
30-34	49.5(1288)	50.5(1316)
35-39	49.9(1113)	50.1(1118)
40-44	49.3(1030)	50.7(1060)
45-49	44.0(787)	56.0(1001)
Region	$\chi^2 = 268.27^{***}$	
Barisal	51.9(960)	48.1(890)
Chittagong	46.9(1211)	53.1(1371)
Dhaka	52.0(1409)	48.0(1300)
Khulna	56.2(1333)	43.8(1038)
Rajshahi	56.5(1308)	43.5(1007)
Rangpur	60.2(1348)	39.8(891)
Sylhet	38.0(703)	62.0(1147)
Type of place of residents	$\chi^2 = 75.72^{***}$	
Rural	54.5(5685)	45.5(4752)
Urban	47.2(2587)	52.8(2892)
Religion	$\chi^2 = 135.75^{***}$	
Muslim	53.6(7570)	46.4(6548)
Non Muslim	39.0(702)	61.0(1096)
Respondents education	$\chi^2 = 1211.98^{***}$	
Illiterate	59.3(2724)	40.7(1868)
Primary	62.0(3096)	38.0(1897)
Secondary	44.4(2396)	55.6(3006)
Higher	6.0(56)	94.0(873)
Socio economic status	$\chi^2 = 392.36^{***}$	
Poor	59.8(3484)	40.2(2345)
Middle	57.3(1749)	42.7(1306)
Rich	43.2(3039)	56.8(3993)
Ever use of any method	$\chi^2 = 25.99^{***}$	
No	49.4(3027)	50.6(3098)
Yes	53.6(5245)	46.4(4546)
Respondents education	$\chi^2 = 862.06^{***}$	
Illiterate	60.8(3037)	39.2(1956)
Primary	58.5(2516)	41.5(1784)
Secondary	48.3(2213)	51.7(2365)
Higher	24.7(506)	75.3(1539)
Partners occupation	$\chi^2 = 160.23^{***}$	
Agriculture	59.3(2456)	40.7(1683)
Business	48.2(1745)	51.8(1876)
Service	55.3(1226)	44.7(990)
Others	47.9(2845)	52.1(3095)
Respondents currently working	$\chi^2 = 22.38^{***}$	

Table 2: *Continued ...*

Background variables	Age at first motherhood	
	≤ 17 years	> 17 years
Not working	52.7(7266)	47.3(6519)
Working	47.2(1006)	52.8(1125)
Spousal age difference	$\chi^2 = 204.48^{***}$	
< 6 years	42.0(1550)	58.0(2141)
6-10	53.4(3279)	46.6(2864)
10+	56.6(3443)	43.4(2639)
Age at first marriage	$\chi^2 = 6064.85^{***}$	
=<14 years	82.6(5469)	17.4(1153)
15-17 years	46.2(2803)	53.8(3258)
=>18 years	0.0(00)	100.0(3233)
Total	52.0(8272)	48.0(7644)

Source: BDHS-2011(NIPORT, Dhaka). Note: The Number in the parenthesis is the number of the respondents.

8. Simple correlation among age at first cohabitation, timing of first motherhood and age at first motherhood

In this study, marriage is found to be an important covariate of age at first motherhood as well as timing of first motherhood. Table 3 presents mean age at first cohabitation, mean timing of first motherhood and average age at first motherhood as well as their correlation. In Bangladesh the mean age at first cohabitation is found only 15.53 years. Overall mean timing of first motherhood is 28.86 months. We have found mean age at first cohabitation is one of the lowest and mean timing of first motherhood is one of the longest in Bangladesh. Therefore, it can be expected that mean age at first motherhood could be higher. But our analysis shows that the mean age at first motherhood is only 17.92 years.

The simple correlation analysis is also employed to find their relationships. The study reveals that age at first cohabitation is significantly negatively correlated with timing of first motherhood while the age at first motherhood is positively correlated with age at first cohabitation. This means that as the age at first cohabitation increases the mean time of first motherhood reduces and age at first birth increases.

Table 3: Age at first cohabitation, timing of first motherhood and age at first motherhood

Variables	Mean	Correlation Coefficient Between	
		X ₁ and X ₂ ($r_{x_1x_2}$)	X ₁ and X ₃ ($r_{x_1x_3}$)
Age at first marriage (X ₁)	15.53 years		
Timing of first motherhood (X ₂)	28.86 months	-0.144***	0.743***
Age at first motherhood (X ₃)	17.92 years		

Source: BDHS-2011(NIPORT, Dhaka); *** p<0.01

9. The Cox's proportional hazard analysis of age at first motherhood

Respondents' who do not have any live birth at the time of survey is considered as censored cases as in retrospective enquiry it is not feasible to follow them until they either have a first live birth or no longer able to conceive. Therefore, censor cases involve particular treatment in estimating exposure time as in this situation linear regression procedures are not appropriate. To overcome this difficulty of censoring, survival model assumes that censored individuals will ultimately understand the event at some future time. In that case, it would be appropriate to use multivariate techniques like "Hazard regression analysis" that allows for the inclusion of both the censored and uncensored cases about a duration variable like "Age at first motherhood". This study makes use of the hazard model to generate the determinants of age at first motherhood in Bangladesh. As per requirements of the Cox's proportional hazard regression analysis the variable 'Marriage to first birth intervals' are categorized as one (1) and the variable 'Marriage to date of interview' are categorized as zero (censored cases). The odds ratios along with values of the coefficients are given in table 4.

Table 4: Cox's proportional hazard regression coefficients and relative risk of age at first motherhood by different covariates

Background characteristics	Coefficient(β)	S.E.	Odds ratio
Age of respondents			
=<19 years (RC)	.....	.....	1.00
20-24	.665	.037	1.944***
25-29	.769	.037	2.157***
30-34	.765	.038	2.149***
35-39	.745	.039	2.107***
40-44	.689	.040	1.991***
45-49	.629	.041	1.876***
Region			
Barisal(RC)	.....	.....	1.00
Chittagong	.071	.031	1.074**
Dhaka	.007	.031	1.007
Khulna	.018	.031	1.018
Rajshahi	.010	.032	1.010
Rangpur	.044	.032	1.045
Sylhet	.055	.034	1.056*
Type of place of residents			
Rural(RC)	.....	.....	1.00
Urban	.015	.019	1.015
Religion			
Muslim(RC)	.....	.....	1.00
Non Muslim	-.006	.026	.994
Respondents education			

Table 4: *Continued ...*

Background characteristics	Coefficient(β)	S.E.	Odds ratio
Illiterate(RC)	.....	.....	1.00
Primary	.027	.022	1.027
Secondary	-.057	.027	.945**
Higher	-.145	.048	.865***
Socio economic status			
Poor(RC)	.....	.....	1.00
Middle	.003	.023	1.003
Rich	-.014	.023	.986
Ever use of any method			
No (RC)	.....	.....	1.00
Yes	.338	.024	1.403***
Husbands education			
Illiterate(RC)	.....	.....	1.00
Primary	.013	.022	1.013
Secondary	-.029	.025	.972
Higher	-.073	.035	.929**
Husbands occupation			
Agriculture(RC)	.....	.....	1.00
Business	.015	.025	1.015
Service	-.004	.023	.996
Others	.018	.027	1.018
Respondents currently working			
Not working(RC)	.....	.....	1.00
Working	-.027	.024	.974
Spousal age difference			
< 6 years (RC)	.....	.....	1.00
6-10	.064	.021	1.066***
10+	.103	.022	1.109***
Age at first marriage			
=<14 years	.....	.....	1.00
15-17	-.479	.019	.620***
=>18	-.908	.025	.403***
-2log likelihood	298583.936		
Censored	1684		

Source: BDHS-2011(NIPORT, Dhaka). Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$, RC = Reference category

We have considered 12 socio-economic and demographic variables, which were found to have significant association with age at first motherhood in bivariate analysis (Table 2). Among these variables, only five variables- like current age of respondents, age at first cohabitation, respondents education, ever use of any contraceptive method and spousal age difference have been found significant effect on age at first motherhood. Husband's education and occupation are also found partially significant effect on age at first motherhood.

From the Table 4, it has been seen that the respondents whose current age lies between 20 to 24 years have 1.944 times higher risk of having first birth early to those whose current age is less than or equal to 19 years. Women whose current age lies between 45 to 49 years have 1.876 times higher risk of occurring first birth early to those whose current age is less than or equal to 19 years. The regions of residence are found partially significant effect on age at first cohabitation. Respondents who are living in Chittagong and Sylhet division respectively are found to have 1.074 and 1.056 times higher risk of giving first birth early than the respondents who are residing in Barisal division. Differential of age at first marriage across the country may be one of the probable reasons for the differentials of age at first motherhood among the regions.

Results from the Table 4 illustrate that respondents' educations are found highly significant effect on age at first birth. Respondents who are higher educated are found 13 percent lower risk of giving first birth as compared to their illiterate counterparts. Use of contraception before first birth may be the important cause for lower risk of having first birth among higher educated respondents.

Ever use of any method is found statistically significant positive influence on age at first motherhood. It is evident from the Table 4 that the odds is 1.403 for women who use any method, which indicates 1.403 times higher risk of having first birth compared to those who do not use any method. Among the respondents whose husbands are higher educated, only 7 percent are observed to be lower risk of giving first birth of those who are illiterate and it is partially significant of age at first motherhood. As expected, spousal age difference is also found important significant predictor of age at first motherhood. The spousal age difference of 6 to 10 years is found to have 1.066 times higher risk of getting first birth than those whose age difference is less than 6 years. Moreover, the respondents whose spousal age difference is 11 years and above are found to have 1.109 times higher risk of occurring first birth compared to those whose age difference is less than 6 years. Age at first marriage is found statistically significant positive influence on age at first motherhood. Among the respondents whose age at first marriage lies between 15 to 17 years have 38 percent lower risk of occurring first birth as early as compared to respondents married less than or equal 14 years. The findings from the Cox's proportion hazard model indicate that current age, education, age at first cohabitation, ever use of any method and spousal age difference are the most important significant determinants of age at motherhood in Bangladesh

10. Conclusions and recommendations

In this research, an attempt has been made to determine the females age at first motherhood as well as to investigate its significant covariates in Bangladesh. The findings obtained from this study are briefly discussed and probable interpretations have been mentioned in the following section.

The findings of this research work show that the overall mean age at first motherhood in Bangladesh is observed to be 17.92 years. This value is undoubtedly lower than expected in the context of fertility. The low mean age at motherhood is mainly due to the extremely lower mean age at first cohabitation, low contraceptive use rate before first birth, illiteracy and adolescent sterility among the young females in Bangladesh. Our analysis also reflects that age at first marriage is positively related to age at first birth. The mean age at first birth is about 6 years higher among the women who married beyond 18 years and above compared to the women who married before aged 15 years. The mean age at first cohabitation among the respondents considered in this study is observed only 15.53 years, which is far below the minimum legal age at first marriage for females (18 years), fixed by the government of Bangladesh in 1976. Legislation on the marriage, therefore, seems to be ineffective preventing childhood marriage practice. Early marriage and resulting early child are engaged in high fertility, lower condition of women and serious health risks for both the mothers as well as their infants.

The findings of this research reflect that education is the most predominant factor to reduce the age at first birth. Besides this, creation of job opportunity, higher education is needed to build career and this in terms leads to higher age at first motherhood. Our study further reflects that the impact of religious practice is more on the age at first motherhood. Muslim women have the early first birth compared to their non-Muslim sisters. The rural-urban differential also displays that the mean age at first motherhood is found highest in the city areas (18.39 years). In the bivariate analysis of age at first motherhood we show that all independent variables are significantly associated at 1 percent level. The findings of multivariate analysis state that the age at first cohabitation, spousal age difference, ever use of any contraceptive method, current age of respondents, and education are found to be the most significant covariates of age at first motherhood in Bangladesh.

Based on the findings of this research task the following recommendations can be suggested for effective policy implications:

- i. Age at first cohabitation is positively associated with age at first motherhood. Therefore, necessary steps should be launched to increase age at first motherhood in Bangladesh.
- ii. Respondent's education is responsible for increasing the age at first motherhood. Thus, proper education policy must increase education levels of the females;
- iii. Job opportunity should be created in order to increase the age at first motherhood;
- iv. Family planning programs should be launched across the country, mainly between the age group of 15 to 29 years in order to increase the age at first motherhood;
- v. Age gaps between brides and groom increase the age at first motherhood. Thus, there should have minimum spousal age difference between couples;
- vi. The existing Marriage Act should be implemented all over the country;
- vii. Finally, mass media campaign should be strengthened for increasing age at first motherhood in Bangladesh.

Proper implementation of the aforementioned recommendations can increase the age at first motherhood, which will contribute to a decline in fertility in Bangladesh.

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