Journal of Health Science 2023, 13(1): 1-8
DOI: 10.5923/j.health.20231301.01

Determination of Influencing Factors on Age at First Birth of Ever-married Women in Bangladesh: Multinomial Logistic Model

Dhaneswar Chandro Sarkar

Department of Statistics, Mawlana Bhashani Science and Technology University, Tangail, Bangladesh

Abstract Age at first birth is a crucial factor in the reproductive process since it indicates a woman's level of fecundity and potential fertility during the early stages of marriage. In general, fertility analysts believe that pregnancy only takes place during marriage. This study attempts to assess and identify the influencing factors that affect age at first birth among ever-married women in Bangladesh. Data for this study have been extracted from the nationally representative Bangladesh Demographic and Health Survey 2017-2018 and univariate, bivariate and multivariate analyses were employed. There were 15408 women in the study who were 15 to 49 years of age. The findings show that 62.1% ever-married women gave their first birth at age $\leq$ 18 years, 33.4% gave their first birth at age 19-24 years and 4.6% gave their first birth at age $\geq$ 25 years. Bivariate analysis with chi-square test shows that all covariates (except receive health service) have significant ($p < 0.001$) effect on age at first birth of ever-married women in Bangladesh. The findings of multinomial logistic regression model revealed that women are more likely to have first birth at age $\leq$ 18 years if they are from Barisal (OR: 1.54, $p < 0.001$), Chittagong (OR: 1.64, $p < 0.001$), Dhaka (OR: 1.45, $p < 0.001$), Khulna (OR: 1.84, $p < 0.001$), Mymensingh (OR: 1.61, $p < 0.001$), Rajshahi (OR: 1.94, $p < 0.001$), and Rangpur (OR: 2.30, $p < 0.001$) divisions. Results also suggested that women are more likely to have first birth at age $\leq$ 18 years if they are not educated (OR: 5.28, $p < 0.001$), completed primary (OR: 5.23, $p < 0.001$), and secondary (OR: 3.84, $p < 0.001$) education level. Results also show that women are more likely to have first birth at age $\leq$ 18 years if they are from middle class (OR: 1.21, $p < 0.01$) socio-economic status (SES), Muslim religious (OR: 1.42, $p < 0.001$), having no contraception (OR: 1.63, $p < 0.001$), age at first marriage (OR: 1.12, $p < 0.001$), and being not worked (OR: 0.79, $p < 0.001$). Finally, health policy should prioritize in increasing age at marriage and educational levels of women and reducing spatial and socioeconomic inequalities in order to increase age at first birth of ever-married women in Bangladesh.

Keywords Age at first birth, Factors, Ever-married, Multivariate analysis, Odds ratio

1. Introduction

Bangladesh is the eighth-most populated country in the world with almost 2.2 percent of the world's population. As per the 2021 census of Bangladesh, the country's population is 165,158,616. According to recent estimates from the Bangladesh Bureau of Statistics (BBS), the population of the country is about 158 million, with a population density of 1,070 persons per square kilometer in 2022 [1].

Currently, the nation is going through a demographic shift. In the ensuing decades, a modest population rise due to the ongoing fall in the natural growth rate is anticipated [2]. The age at first birth refers to a woman's age (in years) when giving birth to her first child. Her first child's birth was the first. The first child's birth marks the beginning of a woman's involvement in the demanding obligations of motherhood and childcare and is one of the most significant and crucial events in her life [3].

A woman's transition into motherhood is marked by her first birth. It is important for each woman's future and has a direct impact on fertility [4]. The number of children a woman has during her reproductive years depends on when she first becomes fertile. As a result, the mother's age at the beginning of pregnancy has an impact on all subsequent births throughout her lifetime, which has an impact on population growth and future development.

In 2017, 2.5 million newborns perished and 295,000 women died from pregnancy-related problems [5]. More and more studies support the idea that the timing and frequency of childbearing affect the health of families. According to earlier studies, the causes for delayed first equality include

* Corresponding author:
dhaneswar.stat@mbstu.ac.bd (Dhaneswar Chandro Sarkar)
Received: Jun. 10, 2023; Accepted: Jul. 3, 2023; Published: Aug. 23, 2023
Published online at http://journal.sapub.org/health

increased use of contraceptives, better education for women, and more workforce engagement. Very few other studies also suggest that education has an impact on a baby's age at delivery [6]. The timing of women's first pregnancies varies depending on their level of education, with women who have graduated from college having their first child later than those who did not. Additionally, previous studies revealed the effects of employment. Examining the dynamics and spacing of births is a part of population research. As a result, the total fertility rate is the average number of live births that a woman would have throughout her reproductive life if she experienced the present age-specific fertility rates. Several markers, such as the first-birth interval after marriage, can be used to determine the reproductive pattern [7]. The marriage to first birth ratio is influenced by a variety of demographic, social, and cultural factors, especially when the age of effective marriage is noticeably low. The age of the woman upon marriage and the time between that event and the first child are important factors in fertility, as well as consequences for women's roles and broader social development. Along with other factors, the marriage to first birth determines the observed reproductive behavior of the women. Therefore, in a community where the use of contraceptives is relatively low, marriage to the first-born child may be one of the main factors affecting fertility.

The first birth interval has a direct impact on family size as well as infant and mother mortality. The goal of this study is to look into the variables that influence when women in Bangladesh have their first child after being married. From a total fertility rate of more than 6 children per woman in the 1970s to 2.3 children per woman in the 2014 Bangladesh Demographic and Health Survey (BDHS), Bangladesh has seen a significant reduction in fertility during the past five decades, setting a record in demographic transition [8]. For the years 2015 to 2017, there were 2.3 births per woman overall. One of the three primary population dynamics is fertility. Determine the population's size, structure, and makeup in any nation [8].

Each woman's future life is greatly influenced by the first birth, which has a direct impact on fertility. Women in developed nations are delaying having children more and more frequently. We look at pregnancy for first-time mothers of various ages, maternal age at first birth, conception, and mental health during pregnancy. All age cohorts, according to the BDHS 2014 analysis, have a median age at first birth of around 18 years, with the exception of women in the 20–24 years and 25–29 years age groups, who have a median age at first birth of 19 years [8]. According to the BDHS 2014 data, nearly half of Bangladeshi women give birth before they turn 18 years, and 70% do so by age 20 years. The median age at the first birth is one year older among women aged 20 to 49 years in urban regions than in rural ones. For women age 25-29 years in the highest wealth quintile (19.7 years), the median age at first birth is also more than two years higher than for those in the lowest wealth quintile (17.4 years).

2. Methods and Materials

2.1. Data Sources

The data utilized for this study extracted from Bangladesh Demographic and Health Survey (BDHS) 2017-18. The worldwide Demographic and Health Survey serve as a source of population and health data for policymakers and the research community. The 2017-18 BDHS was organized in association with the National Institute of Population and Research and Training (NIPORT), ICF and USA. The investigation was funded by the United States Agency for International Development (USAID) in Bangladesh. This was implemented under the auspices of the National Institute of Population Research and Training (NIPORT), Medical Education and Well-Being Division of the Ministry of Health and Family Welfare, Mitra and Associates, a private investigative agency, was collecting data from October 2017 to March 2018 study.

2.2. Study Design

The BDHS model for 2017-18 is nationally representative and covers the entire population living in non-governmental housing units in the country. As a sampling frame, the survey lists the Counting Areas (EA) provided by the Population and Housing Census of the People's Republic of Bangladesh for 2011 for the Bangladesh Bureau of Statistics (BBS). The Primary Sample Unit (PSU) of the survey is an EA, with an average of 120 households. Bangladesh has eight administrative divisions: Barisal, Chittagong, Dhaka, Mymensingh, Khulna, Rajshahi, Rangpur and Sylhet. Each division is partitioned into districts, and each district is separated into Upazilas. Each urban area of the upazila is subdivided into wards, which are further subdivided into mohollas. The rural area of upazilas is partitioned into union parishads (UP). These divisions make it possible to divide the entire country into rural and urban areas.

This survey is based on a two-stage stratified sample of households. In the first step, the 675 EA was chosen with the probability corresponding to the EA size, 250 EA in urban areas and 425 EA in rural areas. In the first phase, BBS extracted households according to the specifications provided by the DHS team. A complete household listing operation was conducted on all selected EAs to provide a model framework for second-level households' selection.

In the second stage, an average of 30 households strain samples per EA were selected for statistical confidence in national, urban, and rural, and eight key demographic and health variables. According to this design, 20,250 households have been selected. The completed interview is expected by approximately 20,100 ever-married women aged 15-49 years. Finally, this study used 15408 ever-married women aged 15-49 years to determine influencing factors on age at first birth in Bangladesh.

2.3. Outcome Variable

To conduct this study we have used one outcome variable:

Age at first birth. Age at first birth is measured in completed years. The age at first birth of the ever-married women has divided into three categories: Age $\leq$ 18 years, 19-24 years and $\geq$ 25 years. The main goal of this study is to determine the factors influencing on age at first birth of ever married women in Bangladesh.

2.4. Explanatory Variables

From a huge number of variables, we have included 15 explanatory variables in this study these are: respondent's current age, division, place of residence, wealth index, educational level, religion, currently working status, occupation, age at first marriage, use of contraception, spousal age difference, aware of health services, husband's educational level and husband's occupation.

2.5. Statistical Analysis

Data have been statistically analyzed by univariate, bivariate and multivariate: multinomial logistic regression analyses for identify the significant determinants and the effect of explanatory variables on response variable. All data were analyzed using statistical package (SPSS Inc.). A probability of $p < 0.05$ was considered statistically significant.

2.5.1. Estimation of Parameters

Multinomial logistic regression analysis is the most widely used technique when the dependent variables are categorized into three categories. To develop the model, assume that *p* covariates and a constant term, denoted by the vector, x, of length p+1where $x_0 = 1$. Then two logit function as;

$$g_1(x) = \ln[p(Y = 1/x)/p(Y = 0/x)] = \acute{x}\beta_1 \quad (1)$$

and

$$g_2(x) = \ln[p(Y = 2/x)/p(Y = 0/x)] = \acute{x}\beta_2 \quad (2)$$

A general expression for the conditional probability in the three category model is,

$$p(Y = j/x) = e^{g_j(x)}/\sum_{j=0}^{2} e^{g_j(x)}$$

where, the vector $\beta_0 = 0$ and $g_0(x) = 0$.

2.5.2. Test Statistic

For test the significance of the coefficients the present study used the Wald's test statistic. To test the hypothesis $H_o : \beta_i = 0$ vs. $H_1 : \beta_i \neq 0$, the wald's test statistic is given by;

$$W = \frac{\hat{\beta}_i}{SE(\hat{\beta}_i)} \sim N(0\,,1)$$

Or equivalently,

$$W = \frac{\hat{\beta}_i^2}{[SE(\hat{\beta}_i)]^2} \sim \chi_1^2 \text{ under } H_0$$

where $SE(\hat{\beta}_i)$ can be obtained from the inverse of the observed information matrix. i.e. $Var(\hat{\beta}) = [I(\hat{\beta})]^{-1}$.

3. Results

Characteristics of the study women

Of 15408 study ever-married women, 26% belongs to the age less than or equal 25 years, 37.6% belongs to the age group 26-35 years, and rest of 36.4% belongs to the age at 36 years and more. Among the study women, 66.1% lived in rural areas, 16.1% had no formal education, about 20% lived with lowest wealth, and 89.9% was Muslim (Table 1). About 49.3% of the study ever-married women were unemployed, 6.1% women reported that they did not use any method of contraception in Bangladesh. Among the participants, 22.7% women's husband had no formal education, and moreover 60% ever-married women reported that their age at first birth is less than or equal 18 years (Table 1).

Table 1. Percentage distribution of the respondent according to their background characteristics

Background characteristics	N	(%)
Current age		
≤ 25	4006	26.0
26-35	5797	37.6
≥ 36	5605	36.4
Division		
Barisal	1669	10.8
Chittagong	2207	14.3
Dhaka	2082	13.5
Khulna	2062	13.4
Mymensingh	1757	11.4
Rajshahi	1980	12.9
Rangpur	1990	12.9
Sylhet	1661	10.8
Place of residence		
Urban	5226	33.9
Rural	10182	66.1

Background characteristics	N	(%)
Educational level		
No education	2482	16.1
Primary	5135	33.3
Secondary	6004	39.0
Higher	1787	11.6
Wealth index		
Poorest	3067	19.9
Poorer	3091	20.1
Middle	3122	20.3
Richer	3071	19.9
Richest	3057	19.8
Religion		
Non-Muslim	1560	10.1
Muslim	13848	89.9
Currently working status		
No	7601	49.3
Yes	7807	50.7
Age at first marriage		
≤ 18	13339	86.6
≥ 19	2069	13.4
Spousal age difference		
≤ 5	4844	31.4
6-10	6155	39.9
≥ 11	4409	28.6
Use of contraception		
No	935	6.1
Yes	14473	93.9
Received health services		
No	15341	99.6
Yes	67	0.4
Occupation		
Unemployment	7240	47.0
Agriculture	5725	37.2
Business & Profession	2443	15.9
Husband's education level		
No education	3502	22.7
Primary	5052	32.8
Secondary	4440	28.8
Higher	2414	15.7
Husband's occupation		
Unemployed	331	2.1
Agriculture	4055	26.3
Business & Profession	11022	71.5
Age at first birth		
≤ 18	9563	62.1
19-24	5143	33.4
≥ 25	702	4.6
Total	15408	100.0

Factors associated with age at first birth

In order to know whether the covariates are significantly associated with women's age at first birth, bivariate analysis with Chi-square test has been employed in this study and the results are presented in Table 2. Covariates women's current age, administrative divisions, place of residence, educational level, wealth index, religion, currently working status, age at first marriage, spousal age difference, contraception, husband's educational level, and husband's occupation are highly significantly ($p < 0.001$) associated with women's age at first birth in Bangladesh.

Table 2. Association between women's age at first birth with their background characteristics

Background characteristics	Age at first birth			Chi-square value	P-value
	≤ 18 (%)	19-24 (%)	≥ 25 (%)		
Current age					
≤ 25	28.6	24.5	1.1		
26-35	36.3	38.8	46.4	272.086	0.000
≥ 36	35.1	36.7	52.4		
Division					
Barisal	10.8	11.0	9.8		
Chittagong	14.1	15.5	9.3		
Dhaka	12.6	15.0	15.2		
Khulna	13.9	12.6	13.0	285.095	0.000
Mymensingh	11.8	10.3	13.8		
Rajshahi	13.9	11.1	10.8		
Rangpur	14.7	9.9	10.7		
Sylhet	8.3	14.5	17.4		
Place of residence					
Urban	30.9	36.9	52.7	170.151	0.000
Rural	69.1	63.1	47.3		
Educational level					
No education	18.2	12.8	12.0		
Primary	37.6	27.7	16.7	1976.483	0.000
Secondary	40.2	39.1	21.5		
Higher	4.1	20.4	49.9		
Wealth index					
Poorest	22.8	15.9	9.7		
Poorer	22.0	17.8	9.7		
Middle	21.7	18.4	14.7	689.769	0.000
Richer	18.9	21.7	20.9		
Richest	14.6	26.2	45.0		
Religion					
Non-Muslim	7.7	13.8	16.5	172.551	0.000
Muslim	92.3	86.2	83.5		
Currently working status					
No	46.4	54.0	54.6	85.042	0.000
Yes	53.6	46.0	45.4		
Age at first marriage					
≤ 18	99.8	70.0	26.9	4807.001	0.000
≥ 19	0.2	30.0	73.1		
Spousal age difference					
≤ 5	27.9	35.8	48.3		
6-10	41.1	38.9	32.8	208.800	0.000
≥ 11	31.1	25.4	18.9		
Use of contraception					
No	4.9	7.1	14.4	118.289	0.000
Yes	95.1	92.9	85.6		
Received health services					
No	99.5	99.7	99.7	4.511	0.105
Yes	0.5	0.3	0.3		
Husband's education level					
No education	21.0	25.1	28.9		
Primary	33.2	31.9	34.3	74.895	0.000
Secondary	30.3	27.4	19.1		
Higher	15.5	15.7	17.7		

Background characteristics	Age at first birth			Chi-square value	P-value
	≤ 18 (%)	19-24 (%)	≥ 25 (%)		
Husband's occupation					
Unemployed	2.0	2.4	2.1	133.187	0.000
Agriculture	29.3	22.4	14.8		
Business & Profession	68.7	75.2	83.0		

Determinants of age at first birth

Table 3 presents the odds ratio (OR) with level of significance obtained from the multinomial logistic regression models. Model-I suggest that the women who belong to the age less than or equal 25 years and belong to the age group 26-35 years have 1.76 times ($p < 0.001$) and 1.38 times ($p < 0.001$) more likely to have first birth at the age of ≤ 18 years respectively than those women who belongs at the age of 36 years or above in Bangladesh. This is because the early aged ever-married women are immature and dependent on their husbands. Model-II also suggest that the women who belong to the age less than or at the age of 25 years and belong to the age group 26-35 years have 0.03 times ($p < 0.001$) and 0.69 times ($p < 0.001$) less likely to have first birth at age of 25 years or above respectively than those women who belongs at the age of 36 years or above in Bangladesh. Compared to Sylhet division, women from Barisal (OR: 1.54; $p < 0.001$), Chittagong (OR: 1.64; ($p < 0.001$)), Dhaka (OR: 1.45; ($p < 0.001$)) and Khulna (OR: 1.84; $p < 0.001$) divisions are more likely to have first birth below or at the age of 18 years in Bangladesh (Table 3).

Table 3. Odds ratios with different covariates obtained from multinomial logistic regression model

Covariates	Model - I	Model - II
Current age		
≤ 25	1.758***	0.026***
26-35	1.375***	0.693**
≥ 36	1	1
Division		
Barisal	1.537***	0.776
Chittagong	1.641***	0.467***
Dhaka	1.446***	0.799
Khulna	1.838***	0.951
Mymensingh	1.614***	1.410*
Rajshahi	1.940***	0.915
Rangpur	2.301***	0.885
Sylhet	1	1
Place of residence		
Urban	0.159***	1.022
Rural	1	1
Educational level		
No education	5.281***	0.470***
Primary	5.225***	0.317***
Secondary	3.839***	0.316***
Higher	1	1
Wealth index		
Poorest	1.136	1.237
Poorer	1.094	1.003
Middle	1.211**	1.142
Richer	1.027	1.021
Richest	1	1
Religion		
Muslim	1.417***	0.176**
Non-Muslim	1	1
Currently working status		
No	0.786*	0.936
Yes	1	1
Age at first marriage		
≤ 18	1.121***	0.196***
≥ 19	1	1
Spousal age difference		
≤ 5	0.495***	1.961***
6-10	0.751***	1.261*
≥ 11	1	1
Use of contraception		
No	1.625***	4.021***
Yes	1	1
Received health services		
No	0.658	0.777
Yes	1	1
Husband education level		
No education	1.053	1.018
Primary	1.070	1.024
Secondary	1.019	0.935
Higher	1	1
Husband's occupation		
Unemployed	0.916	0.839
Agriculture	1.030	0.974
Business & Profession	1	1

*p < 0.05, **p < 0.01, ***p < 0.001
OR: Odds Ratio

Compared to women who have higher education level, the odds of having first birth at the age of ≤ 18 years are 5.28 times ($p < 0.001$), 5.23 times ($p < 0.001$), and 3.84 times ($p < 0.001$) higher for women who have no education, completed primary and secondary education respectively. Thus it can be said that more education gives the women more knowledge about age at first birth. Compared with women in the richest family, women in the middle family (OR: 1.21; $p < 0.001$) are more likely to have first birth below or at the age of 18 years. Muslim women are 1.42 times ($p < 0.001$) more likely to have first birth below or at the age of 18 years compared to Non-Muslim women with age at first birth 19-24 years. Women who do not use any contraception 1.63 times more likely first birth at age of ≤ 18 years compared those women who are use any method.

Women who are not currently working are less likely to have age at first birth (OR: 0.79, $p < 0.05$) than those women who are working. Compared to women's husbands who have completed higher education, the odds of having age at first birth ≤ 18 years are 1.05 times, 1.07 times and 1.02 times higher for women's husband who no education, completed primary and secondary education respectively but there is no significant difference exists between non educated, primary and secondary educated women's husband in Bangladesh (Table 3).

4. Discussion

A woman's first birth marks entry into motherhood and serves as a vital indicator of overall health. Finding of this study consistent with that of another study where a similar scenario of age at first birth in Bangladesh was found [9]. Regarding the women educational level, it is found to be highest among no education, primary education and secondary educated women. Several studies of Bangladesh, India and Nepal also found that women education has positive impact on age at first birth [4,7,10,11,12].

The findings of this study suggest that women who marry early are more likely to give first birth at early age and who marry later are more likely to give first birth later in Bangladesh which is consistent with other studies [7,9,11,13,14]. Moreover, this study shows that urban mothers are less likely to experience early birth compared to rural mothers in Bangladesh which is consistent with previous studies [3,4,15,16,17,18]. This study also shows a difference in age at first births along religious affiliations. Among religious affiliations, being Muslim affiliated are found to shorten time of first birth as compared to Non-Muslim. This finding is in line with findings from Bangladesh [14,19] and Nigeria [16] which shows that women in Muslim affiliated have a tendency of early first birth than women in Non-Muslim. Results of this study suggested that women who do not use any contraception are more likely to give first birth at early age which is consistent with previous studies [7,10,13,14]. Finding of this study also revealed that lower age difference of spousal are less likely to have first birth at early age than larger age difference of spousal in Bangladesh which is consistent with previous studies [9,13,20,21]. In contrast to our results, some studies showed a reverse association between husband's occupation and women age at first birth [7,14,22].

5. Conclusions

Age at first birth is a transition marks to a woman into motherhood. It is also an important indicator for maternal and child health. Delaying the first birth is a significant mechanism that contributes to decreasing the fertility. Based on BDHS 2017–2018 data, this study analyzed the age at first birth and identifies the influential socioeconomic and demographic factors of Bangladeshi ever-married women. In this study, varieties of methods have used to determine the influencing factors of age at first birth of Bangladeshi ever-married women. By executing and interpreting multinomial logistic regression model, the study demonstrates that the respondent's current age, use of contraceptives, age difference between the spouses at the time of the first marriage, respondent's education, and administrative divisions are significantly influenced factors of age at the first birth of ever-married women in Bangladesh. The present study also indicated that early age at first birth remained a serious problem among mothers in Bangladesh and hope that information derived from this study would be able to help relevant authorities to plan remedial actions.

ACKNOWLEDGEMENTS

I am thankful to the Measure DHS (Demographic and Health Surveys), ICF International, USA for granting access to the BDHS 2017-2018 data. I am also thankful to the National Institute of Population Research and Training (NIPORT) of the Ministry of Health and Family Welfare, Bangladesh for allowing me to use the BDHS 2017-2018 data set.

REFERENCES

[1] Bangladesh Bureau of Statistics. 2021, Bangladesh Population Census Report, National volume, Dhaka, Bangladesh.

[2] National Institute of Population Research and Training, Mitra and Associates, and Macro International. 2014, Bangladesh Demographic and Health Survey, Dhaka, Bangladesh and Calverton, Maryland, USA.

[3] Rabbi, A. M. F. and Kabir, M. H. M. I. 2013, Factors influencing age at first birth of Bangladeshi women-A multivariate approach. American Journal of Public Health Research, 1(7): 191-195.

[4] Hossain, M. and Majumder, A. K. 2019, Determinants of the age of mother at first birth in Bangladesh: quantile regression approach. *Journal of Public Health*, *27*(4): 419-424.

[5] World Health Organization. 2019, Trends in maternal mortality 2000 to 2017: estimates by WHO, UNICEF, UNFPA, World Bank Group and the United Nations Population Division.

[6] Chowdhury, S., Rahman, M., Zayed, N. M. and Shahi, S. K. 2020, Determinants of Age at First Birth of Bangladeshi Women: A Multivariate Approach on DHS 2014 Data. *Journal of Humanities, Arts and Social Science*, *4*(2): 118-125.

[7] Dehesh, T., Malekmohammadi, N. and Dehesh, P. 2022, Associated factors of first-birth interval among women in reproductive age, addressing maternal and child health. Reproductive Health, 19(1): 1-7.

[8] NIPORT. 2016, *Bangladesh demographic and health survey 2014*. Technical report, National Institute of Population

Research and Training (NIPORT), Mitra and Associates, and ICF International, Dhaka, Bangladesh, and Rockville, Maryland, USA.

[9] Haque, A. and Sayem, A. M. 2009, Socioeconomic determinants of age at first birth in rural areas of Bangladesh. *Asia Pacific Journal of Public Health*, *21*(1): 104-111.

[10] Khanal, P. 2021, Determinant of Age at First Birth in Nepal: A Study of Adolescent and Youth Women in NDHS 2016. *Journal of Population and Development*, *2*(1): 130-140.

[11] Chowdhury, A. H. M. Y., Rumana, A. S. and Faisal, A. 2017, Factors affecting age for first birth: an exploratory analysis on Bangladeshi women. *Int J Res Stud Med Health Sci*, *2*(7): 31-37.

[12] Abedin, S. 2011, Identification of Fertility Enhancing and Inhibiting Factors: A Study on Married Adolescents in Bangladesh. *Asia Pacific Journal of Public Health*, 21(1): 191-196.

[13] Nahar, M. Z. and Zahangir, M. S. 2013, Patterns and determinants of age at first birth in Bangladesh. *Turk J Popul Stud*, *35*: 63-77.

[14] Ali, M., Alauddin, S., Khatun, M., Maniruzzaman, M. and Islam, S. M. S. 2021, Determinants of early age of mother at first birth in Bangladesh: a statistical analysis using a two-level multiple logistic regression model. *Journal of Public Health*, *29*(5): 1081-1087.

[15] Tarik, A. M. F. and Kabir, M. H. M. I. 2013, Factors Influencing Age at First Birth of Bangladeshi Women-A Multivariate Approach. *American Journal of Public Health Research*, 1(7): 191-195.

[16] Fagbamigbe, A. F. and Idemudia, E. S. 2016, Survival analysis and prognostic factors of timing of first childbirth among women in Nigeria. *BMC Pregnancy Childbirth*, 16(1): 102-113.

[17] Mhele, K. 2015, Determinants of time to first birth among women in ages 15-24 in Swaziland. *Afr Popul Stud*, 29(2): 1-19.

[18] Mugarura, A., Kaberuka, W. and Atuhaire, R. 2016, Factors determining the age at first birth in Uganda. *Sci Res*, 1(5): 61-66.

[19] Sarkar, P. 2010, Determinants of age at first birth in Bangladesh. *J Mod Math Stat*, 4: 1-6.

[20] Obite, C. P., Bartholomew, D. C., Nwosu, U. I., Anyiam, K. E. and Aminu, S. A. 2021, Marriage to first birth interval in Nigeria: analysis of the roles of social-demographic and cultural factors. SN Social Sciences, 1(5): 1-13.

[21] Rahman, M., Mustafi, M. and Azad, M. 2013, Analysis of the determinant's of marriage to first birth interval in Bangladesh. *International Journal of Management and Sustainability*, *2*(12): 208-219.

[22] Erfani, A. and McQuillan, K. 2008, Rapid fertility decline in Iran: analysis of intermediate variables. Journal of biosocial science, 40(3): 459-478.