

Assessing the Effect of Demographic Factors on Women Health in Bangladesh

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ABSTRACT: Women health is an important issue in Bangladesh as well as in the developing countries around the world. On the aspect of demographic characteristics the present study investigates the effect of demographic factors on health among ever married women in Bangladesh based on Bangladesh Demographic and Health Survey (BDHS) 2014 data. In this study multinomial logistic regression analysis has been employed to identify and assess the effects of demographic factors on ever-married women health in Bangladesh. A total of 18,245 ever-married women aged 15-49 were identified and 17,863 were interviewed. For this study, a total of 2570 ever-married women were selected after last birth within three years preceding the survey for the purpose of the analysis. The findings reveal that 17.8 (459 out of 2570) percent of the ever-married women belong to low health status, 57.7(1481 out of 2570) percent to normal and 24.5(630 out of 2570) percent to overweight or obese. It is also observed that current age, marital status, children ever born, living children, place of residence and family size of the ever-married women have statistically significant ($p < 0.001$) association with their health status. Results of multinomial logistic regression suggested that demographic factors such as women's marital status (OR 0.543; 95% CI [0.430-0.686]; p -value < 0.001), age at marriage (OR 1.375; 95% CI [0.850-1.620]; p -value < 0.01), children ever born (OR 0.666; 95% CI [0.500-0.888]; p -value < 0.01) and place of residence (OR 0.733; 95% CI [0.636-0.845]; p -value < 0.001) have significant effects on their health status of ever-married women in Bangladesh. . Therefore attention should be focused on to control early marriage, hence to reduce number of children ever born and improve the health situation of ever-married women in Bangladesh.

KEYWORDS: Demographic Factors, Effects, Women's health, Odds ratio, Multinomial Logistic Regression.

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I. INTRODUCTION

Women health being the subject of the concern among the policy makers of developing countries, the integration of women into the development process and therefore their participation in economic activities along with men, have been gaining importance in many inter-national and national development plans [1]. In a recent study in India observed that the percentage of urban population and the per capita income were highly significant or moderately significant and were positively correlated with each of the indicators of maternal health [2]. General health of women, encompassing both underweight and overweight, is a major problem with important consequences for survival and healthy development. Body Mass Index (BMI) is a common measure of physical health status of women and it's used to measure underweight or obesity. In many countries, BMI characterized by a less than 18.5 among women, remains the predominant problem, leading to low productivity and less resistance to illness. Low pre-pregnancy BMI of women is known risk factors for poor maternal and birth outcomes. Overweight or obese women are also predisposed to a wide range of reproductive health problems. Maternal obesity can lead to several adverse maternal and fetal complications during pregnancy, delivery and postpartum [3]. It increases the risk for childhood obesity that continues into potentiating trans-generational transmission of obesity [4]. Women form an equal proportion of the population and they have their own social and medical problems [5]. The general health and well-being of a woman greatly inter-related with healthy reproductive life of ever-married women. The leading cause of ill health in women of reproductive age group worldwide can be attributed to reproductive health problems, especially to those in the developing countries [5-6]. Health of women is of big concern, especially during their reproductive period. Women seeks medical care and intervention when the problem they suffer becomes too much to tolerate and often when in the advanced stages of the disease or illness. They also tend to hide the reproductive system-related problems because of the highly sensitive nature and are even hesitant to share with their own family members. Therefore, women need be empowered to take care of their health problems at an earlier stage. Women's active participation in their health-seeking behavior has to be encouraged further so that proper preventive and curative

women-centric services can be provided to improve their overall health and well-being [7]. A large number of literatures asserted that an increased BMI of women is associated with increasing risk of adverse obstetric and neonatal outcome.

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Besides, a low BMI is often associated with adverse health outcomes such as preterm birth, low birth weight and increased risk of early mortality [8]. Early and late stillbirths are also associated with underweight mothers compared to their normal weight counterparts [9]. Since BMI among ever-married women is associated with an increased risk factors of maternal complications during pregnancy, delivery, postpartum, preterm birth, low birth weight, early mortality and adverse obstetric, evidently it is worth to use the health status (BMI status) as proxy for general health status of ever-married women in Bangladesh. In the field of health status measurements, very few scientific and organized studies have so far been done. In the recent past these branches of study received increasing attention of policy makers and researchers. At different times government organizations and individual researchers have tried to measure the health status of ever-married women in Bangladesh and explain the various factors causing them. The present study is devoted to investigate the nature and magnitude of interrelationship between health status and demographic factors with an aim to determine the components that capture the inherent peculiarities of health of ever-married women and interrelationship in presence of demographic phenomena.

II. DATA AND METHODOLOGY

Sample Design and Sample Size

This study utilizes the data extracted from Bangladesh Demographic and Health Survey (BDHS) 2014, which were conducted under the authority of the National Institute of Population Research and Training (NIPORT) of the Ministry of Health and Family Welfare (MOHFW). Mitra and Associates executed the survey with the technical assistance from ORC Macro and financial support from USAID [10]. A nationally-representative household-based sample was created through a stratified and two-stage cluster-sampling strategy. A uniform sampling design was adopted across all regions with urban and rural samples drawn separately and in proportion to the population of the regions. With this sampling design, a total of 18,245 ever-married women aged 15-49 were identified and 17,863 were interviewed. For this study, a total of 2570 ever-married women were selected after last birth within three years preceding the survey for the purpose of the analysis.

Outcome measure

Women's weight status, indicated by their BMI category, was used as the outcome variable in the analyses. BMI was calculated as weight in kilograms divided by height in meter squared. This measurement of BMI is generally considered an appropriate method for epidemiological studies where objective measurement is less feasible. The well-trained field staff during at-home interviews measured body size. Weight was measured using an electronic scale with a precision of 0.1 kg and height was measured with an adjustable measuring-board designed for use in survey settings, which can provide accurate measurements to the nearest 0.1 cm. The World Health Organization (WHO) consultants suggested three categories of BMI cutoff points for Asian countries [11]. A cutoff point less than 18.5 kg/m^2 is used to define underweight or Low health status and BMI 18.5 kg/m^2 to 24.9 kg/m^2 is define as normal health status. A BMI of 25.0 kg/m^2 or more indicates overweight or obese.

Exposure variables

The study considers demographic factors to assess the health status of ever-married women in Bangladesh. The variables included as covariates are: women's current age, marital status, age at marriage, children ever born, number of living children, place of residence, religion and family size. More details on the definition of these variables is available in the BDHS 2014 survey report.

Statistical analysis

In this study descriptive statistics and multivariate analysis such as multinomial logistic regression analysis have been used to identify the relationship and assess the effects of demographic factors on health of ever-married women in Bangladesh. To assess the effect of exposure variables on the outcome measures, multinomial logistic regression analysis was contemplated to be suitable as the outcome measure is polychotomous by nature. The multinomial logistic model is the extension of the binary logistic regression model to outcome measure with $j = 1, 2, 3, \dots, k$ nominal outcomes. In its general form, the probability of an actor i belonging to category j is given by the following formula [12]:

$$Pr (y_i = j|x_i) = \frac{\exp (x_i \beta_j)}{\sum_{k=1}^j \exp (x_i \beta_k)}$$

where x_i is a vector containing the values of m co-variables for person i , and β_k is a vector of $m + 1$ parameters $(\beta_{0k}, \beta_{1k}, \beta_{2k}, \dots, \beta_{mk})$ for each $k = 1, 2, 3, \dots, j$.

To identify the parameters, it is common to choose one reference category and set the corresponding vector of parameters equal to a vector of zeroes. BMI was categorized as underweight, normal weight and overweight or obese. Underweight and overweight or obese were compared to the reference category normal weight respectively. The results of the multinomial logistic regression analysis have been shown by odds ratio (OR) with 95% confidence interval (CI) for easy understanding. The level of significance was set at 5%. Data were analyzed using SPSS (version 22.00).

III. RESULTS AND DISCUSSION

Descriptive characteristics

Descriptive statistics of health status (Body Mass Index) in relation to demographic characteristics among ever-married women in Bangladesh aged 15-49 years shows that more than 17% (n = 459) ever-married women have low health status in their reproductive age group. About 57.7% (n = 1481) ever-married women have normal health status and remaining 24.5% (n = 630) ever-married women have overweight or obese. The associated p values in chi-square analysis suggest significant difference ($p < 0.001$) in three categories of health status by different groups of exposure variables, except for the women’s religious affiliation (Table 1).

Table 1: Association between health status of ever-married women and some selected demographic characteristics

Characteristics	Health status of ever-married women (Percentage)			χ^2 value	Contingency coefficient	P - value
	Under weight	Normal	Obese			
Current age				610.34	0.18	0.000
Less than 20 years	29.0	63.2	7.7			
20 – 29 years	18.3	60.4	21.3			
30 – 39 years	13.7	55.1	31.3			
40 years or more	16.9	54.0	29.1			
Marital status				48.35	0.06	0.000
Married	17.3	57.8	24.8			
Divorced/Separated	25.4	55.4	19.1			
Age at marriage				4.13	0.02	0.000
≤18 years	19.1	58.6	22.4			
>18 years	18.3	57.3	24.4			
Children ever born				14.53	0.03	0.000
1-2 children	16.6	56.9	26.5			
3 or more	18.5	57.1	24.4			
Living children				122.40	0.09	0.000
1child	20.7	57.2	22.1			
2	13.6	57.0	29.4			
3 or more	18.5	56.9	24.6			
Place of residence				705.97	0.20	0.000
Urban	12.2	51.8	36.0			
Rural	20.7	60.8	18.5			
Religion				1.39	0.01	0.500
Muslim	17.8	57.6	24.6			
Non-Muslim	17.3	59.0	23.7			
Family size				44.95	0.05	0.000
1-4	16.5	57.2	26.4			
5-6	17.8	58.1	24.1			
7 or more	20.2	58.1	21.7			

The chi-square test values show significant relationship between health status and women’s current age ($p < 0.001$), women’s marital status ($p < 0.001$), age at marriage ($p < 0.001$), children ever born ($p < 0.001$), number of living children ($p < 0.001$), place of residence ($p < 0.001$) and women’s family size ($p < 0.001$).

Moreover the findings of the study reveal that the women aged less than 20 years are 29.0 percent underweight, 63.2 percent normal weight and only few of them (7.7%) are obese. The women belonging to the age group 20-29, about 18.3 percent of them are underweight, 60.4 percent normal weight and remaining 21.3 percent are overweight or obese. Among the women of aged 30-39 years nearly 14 percent of them have problem of underweight and 55.1 percent of normal weight and about 31.3 percent of them are obese. It is found that underweight problem decreases with increase of women's reproductive age. On the other hand, overweight or obese problem increases with the increase of their reproductive age. In addition, the women of their age after 40 years or above are 16.9 percent underweight, 54.0 percent normal weight and only 29.1 percent of them are overweight or obese. The findings also indicate that among the younger aged reproductive women, the risk of being underweight is severe and among elder aged reproductive women the risk of being overweight or obesity is increasing. The large percentage of younger reproductive women in Bangladesh has risk of being underweight during their early age (Table 1). Results also show that the percentage of women of underweight is higher in divorced or separated women and the percentage of women of obese is higher in married women. Moreover, the findings indicate that the percentage of underweight is higher among those women who are getting married before or at age 18 years.

For another demographic factor, children ever born, it's found that children ever born is significantly negatively associated with being underweight of women but positively associated with being overweight and obese of women. Moreover the number of women with underweight increases with the increase of their children ever born. That means, lower the children ever born of women are more physically sound than those of women with higher children ever born. The findings indicate that the risk of being underweight is comparatively high among women with one living child and the women with two living children the risk of being obese is high. It is also found that the percentage of women of underweight is severe among rural women and risk of being overweight is high among urban women. The value of contingency coefficient evidently suggests that the association is strong for health status of ever-married women and their family size. The findings of this study reflect that underweight is serious in women with five to six and seven or more family members. Besides, overweight or obesity arises high among the women with one to four family members in a household in Bangladesh.

Multivariate analysis

Multinomial logistic regression model shows that current age of ever-married women has significant ($p < 0.05$) effect on their health status in Bangladesh. The reproductive women aged less than 20 years, women belonging to the reproductive age group 20-29 years and age group 30-39 years are 2.70 times and 1.33 times more likely and 0.83 times less likely to be underweight whereas the likelihoods of being overweight are 0.23 times and 0.55 times less likely and 1.02 times more likely among ever-married women aged less than 20 years, women belonging to the reproductive age group 20-29 years and 30-39 years than those women aged 40 years or above with normal health status respectively (Table 2). Women's marital status seems to have highly significant ($p < 0.001$) influence on health status of ever-married women in Bangladesh. Married women are less likely to be underweight (OR = 0.54, 95% CI: 0.43 - 0.69) while more likely to be overweight or obese (OR = 1.74, 95% CI: 1.33 - 2.27) than those women who are divorced or separated having normal health status.

Demographic factor such as women's age at marriage has significant ($p < 0.01$) effect on their health status in Bangladesh. The results affirm that the women who are getting married before or at the age of 18 years more likely to be underweight (OR = 1.38, 95% CI: 0.85-1.62) and less likely to be overweight or obese (OR = 0.98, 95% CI: 0.87-1.12) than those women who are getting married after age of 18 years having normal health status. Another demographic factor such as children ever born have significant ($p < 0.01$) influence on ever-married women health status. Among the women having one to two children ever born are less likely to be under weight (OR = 0.67, 95% CI: 0.50 - 0.89) and more likely to be overweight or obese (OR = 1.42, 95% CI: 1.09 - 1.85) than those women who have three or more children ever born with normal health status. From these findings, it is observed that the relative chance to the health problem of ever-married women increases with the increase of their children ever born in Bangladesh (Table 2).

Women's place of residence has highly significant ($p < 0.001$) influence on their health status. With regards to the place of residence, urban ever-married women are less likely to be underweight (OR = 0.73, 95% CI: 0.64 - 0.85) while more likely to be overweight or obese (OR = 2.22, 95% CI: 1.98 - 2.49) relative to rural women having normal health status in Bangladesh. From these findings, it may be conclude that the risk of being overweight is higher among urban ever-married women than those of rural in Bangladesh.

Table 2: Results of multinomial logistic regression analysis for the effects of demographic factors on health status of ever-married women

Logits	Demographic characteristics	Co-efficient	S.E of Estimates	p-value	Odd Ratio	95% C.I. for OR	
						Lower	Upper
Under weight	Current age						
	Less than 20 years	0.993	0.143	0.000	2.700	2.040	3.574
	20 – 29 years	0.283	0.099	0.004	1.327	1.093	1.610
	30 – 39 years	-0.186	0.091	0.041	0.830	0.694	0.992
	40 years or more (RC)	-	-	-	1.000		
	Marital status						
	Married	-0.610	0.119	0.000	0.543	0.430	0.686
	Divorced/Separated(RC)	-	-	-	1.000		
	Age at marriage						
	≤ 18 years	-0.025	0.070	0.002	1.375	0.850	1.620
	> 18 years (RC)	-	-	-	1.000		
	Children ever born						
	1-2 children	-0.406	0.147	0.006	0.666	0.500	0.888
3 or more (RC)	-	-	-	1.000			
Living children							
1 child	0.021	0.171	0.901	1.021	0.731	1.428	
2	-0.167	0.142	0.240	0.847	0.641	1.118	
3 or more (RC)	-	-	-	1.000			
Place of residence							
Urban	-0.311	0.073	0.000	0.733	0.636	0.845	
Rural (RC)	-	-	-	1.000			
Religion							
Muslim	0.044	0.117	0.707	1.045	0.831	1.315	
Non-Muslim (RC)	-	-	-	1.000			
Family size							
1-4	-0.048	0.083	0.559	0.953	0.811	1.120	
5-6	-0.084	0.084	0.315	0.919	0.780	1.084	
7 or more (RC)	-	-	-	1.000			
Obese	Current age						
	Less than 20 years	-1.480	0.183	0.000	0.228	0.159	0.326
	20 – 29 years	-0.602	0.089	0.000	0.548	0.460	0.652
	30 – 39 years	0.022	0.075	0.020	1.022	0.882	1.184
	40 years or more (RC)	-	-	-	1.000		
	Marital status						
	Married	0.553	0.136	0.000	1.739	1.333	2.268
	Divorced/Separated(RC)	-	-	-	1.000		
	Age at marriage						
	≤ 18 years	-0.013	0.064	0.003	0.981	0.871	1.118
	>18 years (RC)	-	-	-	1.000		
	Children ever born						
	1-2 children	0.351	0.134	0.009	1.421	1.092	1.848
3 or more (RC)	-	-	-	1.000			
Living children							
1 child	-0.175	0.159	0.271	0.840	0.615	1.146	
2	-0.018	0.134	0.895	0.982	0.756	1.277	
3 or more (RC)	-	-	-	1.000			
Place of residence							
Urban	0.798	0.059	0.000	2.220	1.977	2.493	
Rural (RC)	-	-	-	1.000			
Religion							
Muslim	0.104	0.105	0.324	1.109	0.903	1.363	
Non-Muslim (RC)	-	-	-	1.000			
Family size							
1-4	0.008	0.079	0.925	1.008	0.862	1.177	
5-6	-0.031	0.081	0.705	0.970	0.828	1.136	
7 or more (RC)	-	-	-	1.00			

Note: The reference category is: Normal weight of ever-married women for dependent variable and (RC) indicates reference category of independent variables.

IV. CONCLUSION

Women's current age, marital status, age at marriage, children ever born and place of residence have significant effect on their health status in Bangladesh. Ever-married women in Bangladesh are suffering severe health problems at their final stage of reproduction. Moreover, adolescent mothers of Bangladesh are suffering severe health problems than the older aged mothers. The relative chance to the risk of health problem of ever-married women increases with the increase of their children ever born in Bangladesh. With regards to the place of residence, urban women are less likely to face severe health problem compared to those women who live in rural areas in Bangladesh. Family size has an important effect on ever-married women health status and health problem is severe among the ever-married women with larger family size. Findings of this study evidently suggest the existence of health problems among ever-married women of reproductive age group in Bangladesh and health problems specifically for women in reproductive age group must be taken into consideration so that health interventions may be adopted through appropriate policy.

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