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Education of Household Members and Nutritional Status of Children in Bangladesh

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Abstract

Malnutrition is the burning question all over the world's public health. Bangladesh is one of those countries where level of malnutrition of infant and child is very serious and many problems that results from malnutrition in Bangladesh. The aim of this study is to substantiate whether there exists any influence of parents' education for child nutrition as well as to find out the potential effects of non-parental household member's literacy level on child malnutrition. In this study we have found that parents' education is an important factor for child nutrition. Also other household members' education has significant impact on stunting (height for age) and underweight (weight for age). The results of this study focus the policies that encourage participation in schools and higher education program as well as improve economic condition of the households to dilute child malnutrition in Bangladesh.

Keywords: Anthropometric status, stunting, wasting, underweight, BDHS, multinomial logistic regression model.

I. Introduction

There is an enduring worldwide effort focused on the complete eradication of tremendous poverty and hunger. Ninety percent of the worlds stunted children live in 36 developing countries[1]. Malnutrition remains a major cause of disability and mortality, ranked as the top cause of global burden of disease and underlying 53% of deaths in children under five years[1]. The pessimistic scenario suggests that child malnourishment will increase from 166 to 175 million children by 2020[2]. The high levels of malnourishment in children and women in South Asia and Sub-Saharan Africa pose a major challenge for child survival and growth. The examples of Thailand, Vietnam and China show that the problem of malnourishment is entirely preventable.

Malnutrition among children have lifelong implications, its outcomes not only cover the whole life but are transferred from one generation to another. The highest prevalence of malnutrition in Bangladesh among the world has been observed. Among the Bangladeshi children aged below 5 years 41% are stunted, 16% are wasted, and 36% are underweight[3].

All over the developing world education is considered as the key factor for minimizing malnutrition. In these countries, it is well established that mothers' education has much more influence on child nutrition than other members of the family. It has been argued that mothers' education has greater influence than fathers' education on child nutrition as fathers tend to work outside the home and children's have more time to mothers[4]. If mothers are unable to give quality time to their child, in that case other household members education may be effective for childcare[5]. A study conducted in Vietnam using two nationally representative surveys reveals that there exist no significant association between maternal education and child nutrition. Probably since women have to involve work simultaneously at home and outside, they do not get sufficient time to give for breastfeeding as well childcare[6].

It is less explored that child nutrition is affected by neighbors', friends of mothers. In three studies Kravdal[7-9] claimed that since uneducated people in the community may be benefited in all the sector of health issue from their higher educated neighbors' in that community so mortality rate may be reduced by the educational growth in the community. These sights are also similar withothers[10-12]. If job holder mother could not able to give proper time to childcare in that case other household members such as grandparents, older siblings who are more educated than the mother may play effective role in childcare[13,14,4,5,15]. A very few research suggests others household members education may play vital role for child nutrition[9-12]although there are large number of study which found association between child nutrition and parents education.

In this study, we have given emphasis to highlight the relative importance of others household members education level at the side of the parents education level on child nutrition which will be helpful for policy maker to improve the existing situation of child malnutrition in Bangladesh by utilizing the Bangladesh Demographic Health Survey data. The education level of household member other than parents is considered as the maximum level of education of a member of that family having most education besides parents.

II. Data, Measures and Methods

The data used in this study is collected from the BDHS, 2011. Bangladesh Demographic and Health Survey is a nationwide representative survey where the data is collected from two-stage stratified sampling procedure. In the first stage, a total of 600 clusters is selected, 393 clusters from rural and 207 clusters from urban areas. An average of 30 households are selected using systematic sampling from each enumeration area in the second stage. Finally 17842 ever married women of age 12-49 years from the selected households is interviewed to collect data on a complete history of their live births, sex of children including month and year of each birth, survival status and age at the time of the survey or age at death along with socioeconomic and demographic variables.

This study focuses on the 6555 children aged 0-59 months for which complete and plausible anthropometric data as well as data on other socioeconomic and demographic measure were collected.

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In this study outcome variables are height for age called stunting, weight for height called wasting and weight for age called underweight where all are measured as indicators of nutritional status of children although it is very difficult to determine the nutritional state of children using a single measure. Stunting is a measure of chronic malnutrition that indicates reduced linear growth (height) compared to the expected growth in a child of same age. Wasting indicates short term changes in nutritional status. It means a deficit in body weight for same height. And underweight indicates a deficit in body weight compared to the expected weight for the same age, which may result either from a failure in growth or loss of body weight due to malnutrition. For a given group of children, Z-score method is recommended in order to have a comprehensive understanding of malnutrition. In case of stunting it will be considered as severely stunted if HAZ ≤ -3SD, moderately stunted if -3SD<HAZ ≤ -2SD. For underweight it will be considered as severely underweight if WAZ ≤ -3SD, moderately underweight if 3SD< WAZ ≤ -2SD and similarly severely wasting if WHZ ≤ -3SD, moderately wasting if 3SD< WHZ ≤ -2SD[3].

From BDHS data the independent variable others education was computed using household member recode file and merging it to children's recode file. This allowed us to create others education variables in the kids file.

All the independent variables (exposure variables, socioeconomic variables and demographic variables) used in this study are categorical having at least two categories. Exposure variables of this study are Mother's education level (no education, primary, secondary and higher), Father's education level(no education, primary, secondary and higher) and other's education (no education, primary, secondary and higher). Socioeconomic variable are wealth index (poorest, poorer, middle, richer and richest), reading newspaper (yes, no), listening radio (yes, no), watching TV (yes, no), whether household members smoke inside household (yes, no). Demographic variables are region (seven division), type of place of residence (rural, urban), sex of household head (male, female), sex of children (male, female),mother's age at birth (<20, 20-30, 30+ years), birth order (1-2, 3-4, 5+).

Three major steps have been performed for analysis in this study. At first univariate analysis was performed in order to find out the frequencies, percent distributions of each variable. Bivariate analysis was performed in order to find out the association between two variables. For this purpose chi-square test of independence is performed to test the null hypothesis that there is no association among the categories of two qualitative variables.

All three outcome variables have 3 categories each. In multivariate analysis multinomial logistic regression model was used in order to find out net effect of independent variables on each outcome variable. This model was fitted as outcome variable is categorical and having more than 2 categories. Each of the categories of response variables has coded as 0, 1, & 2 for not stunting/wasting/underweight, moderately stunting/wasting/underweight & severely stunting/wasting/underweight respectively. In this case two logit functions: one for $Y = 1$ versus $Y = 0$ and other for $Y = 2$ versus $Y = 0$ can be constructed. Let $X' = (x_0, x_1, x_2, \dots, x_p)$ denote the vector of p covariates along with the constant term $x_0 = 1$ and $\beta_i' = (\beta_{i0}, \beta_{i1}, \beta_{i2}, \dots, \beta_{ip})$ be the vector of $(p+1)$ parameters for i^{th} category of the response variable with β_0' is a null vector. The conditional probability of the outcome categories are $P(Y = i|\mathrm{X}) = \frac{exp\left(\sum_{j=0}^{p} \beta_{ij} x_j\right)}{\sum_{m=0}^{2}\left(exp\left(\sum_{j=0}^{p} \beta_{mj} x_j\right)\right)}; i = 0,1,2$. Then the logit functions are $g_l(X) = \ln\left(\frac{P\,(Y=l|X)}{P\,(Y=0|\,X)}\right) = \sum_{j=0}^{p} \beta_{lj}\, x_j$; and the odds of outcomes $Y = l$ versus $Y = 0$ for a given $X$is $exp\left(\sum_{j=0}^{p} \beta_{lj}\, x_j\right); l = 1, 2$. Consider two group with covariate as $X = U$ & $X = V$ then the odd ratio becomes$OR_l = \frac{exp\left(\sum_{j=0}^{p} \beta_{lj}\, u_j\right)}{exp\left(\sum_{j=0}^{p} \beta_{lj}\, v_j\right)}; l = 1, 2$. The subscript of the odds ratio indicates which outcome is being compared with outcome$Y = 0$. Odds ratio is greater than 1 indicates the odds of outcome category has increased; less than 1 indicates the odds has decreased[16].

To analyze the data, the package STATA 12.1 has been used and data are adjusted for sampling design including the sampling weights. In the analysis, sampling design adopted by BDHS, 2011 is considered, where enumeration area is primary sampling unit and urban city corporation, urban other than City Corporation and rural in each division are considered as strata.

III. Results

In order to know the pattern of distribution of the observation in different groups percentage distributions of different variables are computed which is helpful for further analysis. From the univariate analysis of outcome variables we have found that among 6555 children age 0-59 month 24.87 percent are moderately stunting and 14.42 percent are severely stunting where 12.11 percent are moderately wasting and 4.04 percent are severely wasting. These percentages for moderately and severely underweighted child are 25.11 and 9.72 respectively.

From the analysis of other HH member literacy we found that 23.45% have no education, 35.56% have primary education, 28.02% have secondary education and 12.97% have higher education. Among 6555 children 51.61% are male and 48.39% are female. Most of the people not read newspaper and listen radio regularly but most of them watch TV regularly. Average age of children is 28 month and average proportion of children is 0.23.

From the bivariate analysis results in table-1, the study found that the prevalence of stunting of children is highest among the children whose mothers have no education. Stunting level is decreasing with the increase of mother's education level(p-value<0.001). Prevalence of stunting is highest for those children whose other HH member has primary education and lowest for the children having other

HH member has higher education. Prevalence of stunting is decreasing with the increase of education level of them (p-value<0.001). Stunting is associated with region(p-value<0.05), place of residence (p-value<0.01), wealth index (p-value<0.001), mother's age at birth (p-value<0.05), birth order (p-value<0.001), reading newspaper (p-value<0.001), watching TV (p-value<0.001), and HH members smoke inside HH (p-value<0.001).

Prevalence of wasting of children is highest among the children whose mothers have no education. Wasting level is decreasing with the increase of mother's education level(p-value<0.001). Wasting is highest among the children whose fathers' have no education, lowest among the children whose fathers have higher level education. Father's education has significant (p-value<0.01) association with wasting status of children. Wasting status is highest for those children whose other HH member has primary education. And wasting status is lower with the increase of education level of them(p-value<0.01). Wasting is associated with place of residence (p-value<0.01), wealth index(p-value<0.01), mother's age at birth (p-value<0.05), birth order (p-value<0.05), reading newspaper (p-value<0.10), watching TV (p-value<0.001) and HH members smoke inside HH (p-value<0.01).

Underweight of children is highest among the children whose mothers have no education. The prevalence of underweight is decreasing with the increase of mother's education level (p-value<0.001). Father's education of children also has significant (p-value<0.001) association with underweight of children. Underweight status is highest for those children whose other HH member has primary education. Underweight status is decreasing with the increase of education level of them (p-value<0.001). Underweight is associated with region (p-value<.01), place of residence (p-value<0.001), wealth index (p-value<0.001), sex of HH head (p-value<0.10), sex of children (p-value<0.01), mother's age at birth (p-value<0.001), birth order (p-value<0.001), reading newspaper (p-value<0.001), listening radio (p-value<0.10), watching TV (p-value<0.001) and household members smoke inside household(p-value<0.001).

IV. Multivariate Analysis

To identify the influence of other HH member education along with parents' education on the nutrition status, we examine the net effect of exposure variables on stunting, wasting and underweight in model-1, model-2 and model-3 respectively after controlling some socioeconomic and demographic characteristics. Before fitting these model a model for each dependent variable was fitted considering only education of HH (mother's education, father's education and other's education), the exposure variables, as covariates (not shown in table for page limitation) and all these variables found to have significant influence on stunting, wasting and underweight. When socioeconomic and demographic variables were introduced in the model the significant advantage decreases (p-value increases) while remaining some sort of significant influence on child malnutrition indicating that the education of HH play a vital role on each dependent variable. The results of all three full model are given in the table-2, reveals the followings:

From the first model we found that mother's education has an insignificant influence on child stunting. Father's education and other HH member education has significant influence on child wasting. The odds of moderately stunting of the children whose father's has secondary and higher education are 0.83 (p-value<0.10) and 0.72 (p-vale<0.05) times of those whose father's has no education, whose other HH members hashigher education is 0.62 (p-value<0.01) times of those whose other HH members have no education, who are from middle and richest household are 0.83 (p-value<0.10) and 0.66 (p-value<0.01) times of those who are poorest, whose mothers' age at the time of birth is more than 30 years is 0.74 (p-value<0.05) times of those whose mothers' age at birth is less than 20 years, whose birth order is five or more is 38 percent more (p-value<0.05) than those with birth order 1-2.The odds of severely stunting of the children whose father's has higher education is 0.51(p-value<0.01) times of those whose father's has no education, whose other HH members has secondary education is 0.75 (p-value<0.10) times of those whose other HH members have no education, those who are from Chittagong, Dhaka, Khulna, Rajshahi and Rangpur are 0.77 (p-value<0.10), 0.74 (p-value<0.10), 0.52 (p-value<0.001), 0.36 (p-value<0.001) and 0.70 (p-value<0.01) times of those from Barisal, those who are from rural is 0.71 (p-value<0.01) times of those are from urban, who are from poorer, middle, richer and richest household are 0.74 (p-value<0.05), 0.68 (p-value<0.05), 0.58 (p-value<0.01)and 0.35 (p-value<0.001) times of those who are poorest, who are female is 18 percent more (p<0.10) than male children, whose mothers' age at the time of birth are 20-30 years and more than 30 years are 0.71 (p-value<0.01) and 0.74 (p-value<0.10) times of those whose mothers' age at birth is less than 20 years, whose birth order is five or more is 62 percent more (p-value<0.05) than those with birth order 1-2, those whose mothers' read newspaper is 0.75 (p-value<0.10) times of whose mothers' do not, whose HH members are smoke inside HH is 17 percent more (p-value<0.10) than those are do not.

From the second model we found that fathers' education has an insignificant influence on child wasting. Mother's education and other HH member education has significant influence on child wasting. The odds of moderately wasting of the children whose mother's has secondary and higher education are 0.72 (p-value<0.05) and 0.62 (p-vale<0.10) times of those whose mother's has no education, whose other HH members has primary and higher education are 0.77 (p-value<0.05) and 0.71 (p-vale<0.10) times of those whose other HH members have no education, whose mothers' watching TV is 0.76 (p-value<0.01) times of those whose mothers' do not watch TV, whose HH members are smoke inside household is 17 percent more (p-value<0.05) than those whose HH members are not smoke inside household. The odds of severely wasting of the children those who are from Rajshahi division is 2.02 (p-value<0.10) times of those from Barisal division.

From the third model we found that fathers' education, mother's education and other HH member education has significant influence on child underweight. The odds of moderately underweight of the children whose mother's has primary, secondary and higher education are 0.82 (p-value<0.05), 0.68 (p-value<0.01) and 0.57 (p-vale<0.05) times of those whose mother's has no education, whose other HH members has higher education is 0.70 (p-value<0.05) times of those whose other HH members have no education, those who are from Khulna, Rajshahi and Rangpur are 0.73 (p-value<0.05), 0.77 (p-value<0.01), 0.70 (p-value<0.01) times of those from Barisal, whose mothers' age at the time of birth is 20-30 years and more than 30 years are 0.82 (p-value<0.05) and 0.76 (p-value<0.05) times of those whose mothers' age at birth is less than 20 years.

The odds of severely underweighted of the children whose father's has higher education is 0.52 (p-value<0.05) times of those whose father's has no education, those who are from Khulna, Rangpur and Sylhet are 0.64 (p-value<0.05), 0.74 (p-value<0.10) and 1.60 (p-value<0.01) times of those from Barisal, who are from poorer, richer and richest household are 0.77 (p-value<0.10), 0.47 (p-value<0.001) and 0.35 (p-value<0.001) times of those who are poorest, who are female is 34 percent more (p<0.001) than male children, whose mothers' age at the time of birth are 20-30 years is 0.64 (p-value<0.001) times of those whose mothers' age at birth is less than 20 years, whose birth order is five or more is 77 percent more (p-value<0.05) than those with birth order 1-2, those whose mothers' watching TV is 0.79 (p-value<0.10) times of whose mothers' do not.

V. Conclusion

The main concern of this study was to investigate the influence of different socio-economic and demographic variables on child nutrition in Bangladesh giving most important concentration to the influence of non-parent household members' education.

In this study, we found a high prevalence of malnourishment of children whose household members' education including parents' education level were low compared to children with household members' and parents' education level were high.

We provide empirical evidence that attending at least secondary level of education is essential for mothers in order to develop their children's short-run anthropometric status. The odds of moderately wasting of the children were 38% less whose mother's had higher level of education than those whose mothers' had no education. Other studies in developing countries on this topic[17-21]found that mother's primary level education is elementary to improve long-run and short-run anthropometric status of child. But our study only support the previous study finding for short-run anthropometric status (wasting). This is because, this study joins a very few set of studies which have observed household's education away from education of parents'. From the previous studies we can say other's household members drop out from the education may be difficult for that family sinceother's household members' education may have fundamental effect on children's anthropometric status especially if their parents work outside the home.

For the outcome variables stunting and underweight, father's education level has a highly significant effect. We found that in order to improve children's long-run anthropometric status it is essential for their father to complete at least secondary level of education. This may be the case because Bangladesh is a male dominating country and household purchasing decisions for wellbeing is mostly depends on male decisions.

We also included an additional variable indicating other household member's education level beyond parent's education level to verify whether their education level provide any contribution to child nutrition. In line with other works[21-23] our study reveals that this covariate contributes to elucidate all three anthropometric statuses: stunting, wasting and underweight well. We have some concerns because mothers or parents are not only caretaker for children.

Mother's age at birth, birth order, wealth index, exposure to newspapers, radio and television, and household member's smoking habit inside household are also the most important contributing factor for the child nutrition. Thus the result of this study reveals the fact that stunting, wasting and underweight are the decisive measurement of child malnutrition and are affected by various exposure, socio-economic, demographic characteristics. It is found that educated household members including parentsmakes a rising contribution to the betterment of children nutritional status.

Table 1. Percentage distribution of different anthropometric indices (stunting, wasting and underweight) by socioeconomic and demographic covariates.

Characteristics	Stunting		Wasting		Underweight	
	Moderately stunting	Severely stunting	Moderately wasting	Severely wasting	Moderately underweight	Severely underweight
Mother's education	**p-value<0.001**		**p-value<0.001**		**p-value<0.001**	
No education	29.03	20.87	13.82	5.130	34.67	14.32
Primary education	28.60	16.45	15.09	4.690	27.60	13.37
Secondary education	23.98	10.85	10.16	3.440	21.22	6.800
Higher education	15.53	6.200	7.330	3.050	13.08	3.490
Father's education	**p-value<0.001**		**p-value< 0.01**		**p-value<0.001**	
No education	29.56	18.20	13.06	5.070	31.59	13.39
Primary education	28.17	16.94	13.54	4.380	26.03	12.53
Secondary education	22.89	11.13	11.51	3.370	22.02	7.070
Higher education	18.11	5.450	8.320	3.050	15.68	3.250
Other's education	**p-value<0.001**		**p-value< 0.01**		**p-value<0.001**	

No education	27.14	16.13	14.61	3.930	28.46	11.14
Primary education	29.01	16.95	11.60	4.200	28.00	12.24
Secondary education	24.58	11.16	12.44	4.110	22.43	8.340
Higher education	15.21	7.850	7.780	4.170	15.22	4.240
Region	**p-value<0.001**		**p-value = 0.3574**		**p-value< 0.01**	
Barisal	24.64	19.38	12.42	2.950	28.57	10.39
Chittagong	24.47	14.36	12.27	4.090	25.70	9.610
Dhaka	27.63	14.31	12.49	4.050	24.55	10.17
Khulna	23.07	10.47	11.27	3.440	21.74	6.340
Rajshahi	24.60	8.650	11.44	5.770	24.14	10.57
Rangpur	26.43	15.99	10.49	3.080	25.15	9.240
Sylhet	26.14	20.33	14.89	4.820	29.15	14.89
Place of residence	**p-value < 0.01**		**p-value = 0.1033**		**p-value< 0.001**	
Urban	23.17	12.48	10.73	3.480	20.08	7.330
Rural	26.46	14.56	12.54	4.300	26.57	10.74
Sex of HH head	**p-value = 0.7991**		**p-value = 0.8080**		**p-value < 0.10**	
Male	25.77	14.14	12.21	4.090	24.94	10.11
Female	24.79	13.35	11.01	4.320	26.60	7.970
Wealth index	**p-value<0.001**		**p-value < 0.01**		**p-value< 0.001**	
Poorest	29.65	21.92	14.02	5.110	33.20	15.81
Poorer	28.18	15.95	13.02	4.280	29.40	11.84
Middle	25.74	13.26	13.86	4.010	24.00	10.69
Richer	24.52	11.04	10.45	3.180	20.20	6.330
Richest	19.42	6.750	8.760	3.800	16.89	3.900
Sex of children	**p-value = 0.1679**		**p-value = 0.6853**		**p-value< 0.01**	
Male	25.84	13.17	12.26	4.300	24.08	8.990
Female	25.54	15.05	11.97	3.900	26.12	10.97
Mother's age at	**p-value < 0.05**		**p-value < 0.05**		**p-value< 0.001**	
<20 years	26.69	14.84	13.19	3.930	25.55	10.58
20-30 years	25.48	12.82	11.69	3.720	24.61	8.520
More then 30 years	24.50	17.35	11.62	5.950	25.85	14.11
Birth order	**p-value<0.001**		**p-value < 0.05**		**p-value< 0.001**	
1-2	24.92	12.18	11.71	3.530	23.08	8.320
3-4	25.81	15.66	12.85	4.590	27.70	10.69
5 or more	30.59	22.23	12.74	6.550	30.72	18.77
Reading newspaper	**p-value<0.001**		**p-value < 0.10**		**p-value< 0.001**	
No	26.70	15.36	12.50	4.210	26.60	10.90
Yes	20.34	7.280	10.08	3.530	16.94	4.870
Listening Radio	**p-value = 0.2196**		**p-value = 0.8574**		**p-value< 0.1**	
No	25.76	14.34	12.20	4.090	23.45	10.06
Yes	25.07	11.69	11.37	4.230	21.55	8.870
Watching TV	**p-value<0.001**		**p-value<0.001**		**p-value< 0.001**	
No	27.41	18.27	14.46	3.860	29.72	13.52
Yes	24.56	11.31	10.57	3.610	22.00	7.590
Smoke inside HH	**p-value<0.001**		**p-value< 0.01**		**p-value< 0.001**	
No	25.05	11.69	10.48	3.690	23.26	8.200
Yes	26.21	15.99	13.43	4.440	26.52	11.35

Table 2. Odds ratio from multinomial logistic regression analysis for the assessment of the effects of selected characteristics on nutritional status of children age under 5 years in Bangladesh, 2011.

Characteristics	Model-1: Odds Ratio for Stunting		Model-2: Odds Ratio for Wasting		Model-3: Odds Ratio for Underweight	
	Moderately stunting vs. not stunting	Severely stunting vs. not stunting	Moderately wasting vs. not wasting	Severely wasting vs. not wasting	Moderately underweight vs. not	Severely underweight vs. not
Mother's education						
No education[a]	1.00	1.00	1.00	1.00	1.00	1.00
Primary education	1.01	0.90	1.09	1.13	0.82[d]	1.12
Secondary education	0.94	0.84	0.72[d]	0.92	0.68[c]	0.80
Higher education	0.76	1.02	0.62[e]	0.86	0.57[d]	0.94
Father's education						
No education[a]	1.00	1.00	1.00	1.00	1.00	1.00
Primary education	1.04	1.17	1.14	0.97	0.96	1.18
Secondary education	0.83[c]	0.89	1.13	0.79	0.92	0.88
Higher education	0.72[d]	0.51[c]	1.04	0.71	0.79	0.52[d]
Other's education						

No education[a]	1.00	1.00	1.00	1.00	1.00	1.00
Primary education	1.13	1.01	0.77[d]	1.03	0.94	1.02
Secondary education	0.96	0.75[c]	0.94	1.18	0.85	0.83
Higher education	0.62[c]	0.72	0.71[e]	1.46	0.70[d]	0.64
Region						
Barisal[a]	1.00	1.00	1.00	1.00	1.00	1.00
Chittagong	1.01	0.77[c]	1.07	1.36	0.98	1.09
Dhaka	1.14	0.74[c]	1.05	1.42	0.84	1.05
Khulna	0.86	0.52[b]	0.99	1.29	0.73[d]	0.64[d]
Rajshahi	0.83	0.36[b]	0.94	2.02[e]	0.77[e]	0.99
Rangpur	0.97	0.70[c]	0.78	1.02	0.70[c]	0.74[e]
Sylhet	1.15	1.09	1.24	1.45	1.11	1.60[c]
Place of residence						
Urban[a]	1.00	1.00	1.00	1.00	1.00	1.00
Rural	0.97	0.71[c]	0.99	1.13	1.09	0.91
Sex of HH head						
Male[a]	1.00	1.00	1.00	1.00	1.00	1.00
Female	0.94	1.03	0.97	1.18	1.08	0.89
Wealth index						
Poorest[a]	1.00	1.00	1.00	1.00	1.00	1.00
Poorer	0.89	0.74[d]	0.99	0.92	0.90	0.77[e]
Middle	0.83[e]	0.68[d]	1.19	0.97	0.76	0.77
Richer	0.83	0.58[c]	0.93	0.80	0.64	0.47[b]
Richest	0.66[c]	0.35[b]	0.87	1.12	0.60	0.35[b]
Sex of children						
Male[a]	1.00	1.00	1.00	1.00	1.00	1.00
Female	1.03	1.18[e]	0.98	0.90	1.17	1.34[c]
Mother's age at						
<20 years[a]	1.00	1.00	1.00	1.00	1.00	1.00
20-30 years	0.87	0.71[c]	0.86	0.78	0.82[d]	0.64[b]
More then 30 years	0.74[d]	0.74[e]	0.79	1.03	0.76[d]	0.80
Birth order						
1-2[a]	1.00	1.00	1.00	1.00	1.00	1.00
3-4	0.99	1.21	1.09	1.25	1.12	1.22
5 or more	1.38[d]	1.62[d]	0.99	1.53	1.21	1.77[d]
Reading newspaper						
No[a]	1.00	1.00	1.00	1.00	1.00	1.00
Yes	0.94	0.75[e]	1.17	1.12	0.88	0.84
Listening Radio						
No	1.00	1.00	1.00	1.00	1.00	1.00
Yes	1.05	1.03	1.01	1.09	0.93	1.07
Watching TV						
No [a]	1.00	1.00	1.00	1.00	1.00	1.00
Yes	0.99	0.86	0.76[c]	0.82	0.90	0.79[e]
Smoke inside HH						
No [a]	1.00	1.00	1.00	1.00	1.00	1.00
Yes	0.75	1.17[e]	1.22[d]	1.16	1.05	1.09

a. Reference category b. P-value<0.001 c. P-value<0.01 d. P-value<0.05 e. P-value<0.10

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